

COVID-19

Selection of peer-reviewed articles

Special focus on Pharmaceutical and non-Pharmaceutical interventions since 18-06-20

UPDATE OF
18 JUNE 2020

REACTing shares a selection of the most relevant articles published on COVID-19 on a weekly basis. This literature review not only presents a selection of references, but also highlights the key points and messages from each article. It does not include pre-print articles.

Our objective is to help the scientific community, health-workers and public health decision makers, being up to date with the latest scientific research.

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Additional links:

Rapid Evidence Reviews Group: <https://isaric.tghn.org/covid-19-rapid-evidence-reviews-group/>

Bibliovid: <https://bibliovid.org>

CORD19 Publication Dashboard: <https://france-science.com/en/homepage-english-2/>

List of articles pre-selected by Inserm- Collective Expertise Unit available at:
https://insermbiblio.inist.fr/wp-content/uploads/2020/04/Litt%C3%A9rature_Covid19.xlsx

Journal and date	Title	Authors and link	Field of expertise	Key facts
Nature Medicine 16JUN2020	Age-dependent effects in the transmission and control of COVID-19 epidemics	Davies et al., UK gotopaper	Public Helath/Epidemio	<p>Age-structured mathematical model to epidemic data from China, Italy, Japan, Singapore, Canada and South Korea.</p> <p>Estimation:</p> <ul style="list-style-type: none"> - Susceptibility to infection in individuals under 20 years of age is approximately half that of adults aged over 20 years - Clinical symptoms manifest in 21% (95% credible interval: 12–31%) of infections in 10- to 19-year-olds, rising to 69% (57–82%) of infections in people aged over 70 years <p>-> interventions aimed at children might have a relatively small impact on reducing SARS-CoV-2 transmission, particularly if the transmissibility of subclinical infections is low</p> <p>Conclusion:</p> <p>-> In countries with younger population structures such as many low-income countries the expected per capita incidence of clinical cases would be lower than in countries with older population structures, although it is likely that comorbidities in low-income countries will also influence disease severity.</p> <p>->Without effective control measures, regions with relatively older populations could see disproportionately more cases of COVID-19, particularly in the later stages of an unmitigated epidemic.</p>
Science 15JUN2020	Antibody cocktail to SARS-CoV-2 spike protein prevents rapid mutational escape seen with individual antibodies	Baum, Alina et al. USA gotopaper	Therapeutic	<p>Investigate the development of resistance against 4 antibodies to the spike protein that potentially neutralize SARS-CoV-2, individually as well as when combined into cocktails.</p> <ul style="list-style-type: none"> - Efficacy of antiviral antibodies against the breadth of spike RBD variants represented in publicly available SARS-CoV-2 sequences was assessed using VSV pseudoparticle system expressing the SARS-CoV-2 spike variants => antibodies remain effective against spike variants that have arisen in the human population. - Escape mutants were selected under pressure of single antibodies, as well as of antibody combinations, by using a replicating VSV-SARS-CoV-2-S virus => novel spike mutants rapidly appeared following in vitro passaging in the presence of individual antibodies, resulting in loss of neutralization; such escape also occurred with combinations of antibodies binding diverse but overlapping regions of the spike protein. - Escape following treatment with an antibody cocktail (REGN10987+REGN10933) was assessed, cocktail being rationally designed to avoid escape through inclusion of two antibodies that bind distinct and non-overlapping regions of the RBD, and which can thus simultaneously bind and block RBD function => attempts to grow VSV-SARS-CoV-2-S virus in the presence of this non-competing antibody cocktail did not result in the outgrowth of escape mutants. <p>⇒ Cocktail therapy may provide a powerful way to minimize mutational escape by SARS-CoV-2; in particular when two antibodies were chosen so as to bind to distinct and non-overlapping regions of the viral target, and thus require the unlikely occurrence of simultaneous mutations at two distinct genetic sites for viral escape</p>

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Science 15JUN2020	Potent neutralizing antibodies from COVID-19 patients define multiple targets of vulnerability	Brouwer, Philip J. M. et al. Netherlands/USA gotopaper	Therapeutic	<p>Isolation of monoclonal antibodies from 3 convalescent COVID-19 patients using a SARS-CoV-2 stabilized prefusion spike protein. These antibodies had low levels of somatic hypermutation and showed a strong enrichment in VH1-69, VH3-30-3 and VH1-24 gene usage.</p> <ul style="list-style-type: none"> - 19 NAbs that target a diverse range of antigenic sites on the S protein, of which 2 showed picomolar neutralizing activities (IC50s of 0.007 and 0.009 µg/mL or 47 and 60 pM) against authentic SARS-CoV-2 virus. - Large-scale SPR-based competition assays allowed to define NAbs that target multiple sites of vulnerability on the RBD as well as additional previously undefined non-RBD epitopes on SARS-CoV-2. <p>⇒ Subsequent structural characterization of these potent NAbs will guide vaccine design, while simultaneous targeting of multiple non-RBD and RBD epitopes with mAb cocktails paves the way for safe and effective COVID-19 prevention and treatment.</p>
Science 15JUN2020	Studies in humanized mice and convalescent humans yield a SARS-CoV-2 antibody cocktail	Hansen, Johanna et al. USA gotopaper	Therapeutic	<p>Describe parallel efforts using both humanized mice and convalescent patients to generate antibodies against the SARS-CoV-2 spike protein, yielding a large collection of fully-human antibodies that were characterized for binding, neutralization and three dimensional structure.</p> <ul style="list-style-type: none"> - screened for binding affinity to RBD monomer and dimer, epitope diversity, ability to block ACE2 receptor binding to RBD, and neutralize VSV-based SARS-CoV-2 spike pseudoparticles (pVSV-SARS-CoV-2-S(mNeon)). => Screening yielded over 200 neutralizing mAbs with broad potency ranges, dozens of which displayed neutralization potency in the pM range. - A smaller collection of 4 antibodies was chosen for further analyses to determine whether the above binding data to RBD reflected binding to trimeric spike protein, whether neutralization potencies noted in the above assays were consistent with those seen in other assays including with SARS-CoV-2, and whether these antibodies retained neutralization activity against pseudoparticles with mutations in the S1/S2 cleavage site. - examined 9 most potent neutralizing antibodies in cross-competition binding assays, identifying several pairs of non-competing mAbs with pM neutralization potency that could potentially be combined to form antibody cocktails. <p>⇒ Selection of pairs of highly-potent individual antibodies that simultaneously bind the receptor-binding domain of the spike protein, providing ideal partners for a therapeutic antibody cocktail that may deliver optimal antiviral potency while minimizing odds of virus escape. Such an antibody cocktail is now being tested in human trials (clinicaltrials.gov NCT04426695 and NCT04425629).</p>
Science 15JUN2020	Broad neutralization of SARS-related viruses by human monoclonal antibodies	Wec, Anna Z. et al. USA gotopaper	Therapeutic	<p>Mined the memory B cell repertoire of a convalescent SARS donor and identified 200 SARS-CoV-2 binding antibodies that target multiple conserved sites on the spike (S) protein.</p> <ul style="list-style-type: none"> - A large proportion of the non-neutralizing antibodies display high levels of somatic hypermutation and cross-react with circulating HCoVs, suggesting recall of pre-existing memory B cells (MBCs) elicited by prior HCoV infections. - Several antibodies potently cross-neutralize SARS-CoV, SARS-CoV-2, and the bat SARS-like virus WIV1 by blocking receptor attachment and inducing S1 shedding. <p>⇒ These antibodies represent promising candidates for therapeutic intervention and reveal a target for the rational design of pan-sarbecovirus vaccines.</p>

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The Lancet GH 15JUN2020	Global, regional, and national estimates of the population at increased risk of severe COVID-19 due to underlying health conditions in 2020: a modelling study	Clark et al., UK, China, USA gotopaper	Public Helath/Epidemio	<p>Aim: Understanding the number of individuals at increased risk of severe COVID-19 and how this varies between countries</p> <p>Estimation: -> 1.7 billion people, comprising 22% of the global population, have at least one underlying condition that puts them at increased risk of severe COVID-19 if infected -> 349 million people (4% of the global population) are at high risk of severe COVID-19 and would require hospital admission if infected -> 6% of males to be at high risk compared with 3% of females.</p> <p>The share of the population at increased risk was highest in countries with older populations, African countries with high HIV/AIDS prevalence, and small island nations with high diabetes prevalence. Estimates of the number of individuals at increased risk were most sensitive to the prevalence of chronic kidney disease, diabetes, cardiovascular disease, and chronic respiratory disease. -> About one in five individuals worldwide could be at increased risk of severe COVID-19</p>
Science 15JUN2020	Isolation of potent SARS-CoV-2 neutralizing antibodies and protection from disease in a small animal model	Rogers, Thomas F. et al. USA gotopaper	Therapeutic	<p>Cohort of SARS-CoV-2-recovered participants, neutralization assays to interrogate antibody responses, high-throughput antibody generation pipeline to rapidly screen over 1800 antibodies, and animal model to test protection.</p> <p>Only a small fraction of these Abs was neutralizing, highlighting the value of deep mining of responses to access the most potent Abs.</p> <ul style="list-style-type: none"> - Potent neutralizing antibodies (nAbs) to two epitopes on the receptor binding domain (RBD) and to distinct non-RBD epitopes on the spike (S) protein isolated. - Passive transfer of a nAb provides protection against disease in high-dose SARS-CoV-2 challenge in Syrian hamsters, as revealed by maintained weight and low lung viral titers in treated animals. <p>⇒ The study suggests a role for nAbs in prophylaxis, and potentially therapy, of COVID-19. The nAbs define protective epitopes to guide vaccine design.</p>
Cell research 15JUN2020	Boceprevir, GC-376, and calpain inhibitors II, XII inhibit SARS-CoV-2 viral replication by targeting the viral main protease	Ma, Chunlong et al. USA gotopaper	Therapeutic	<p>This study identified several potent SARS-CoV-2 Mpro inhibitors with potent enzymatic inhibition as well as cellular antiviral activity.</p> <ul style="list-style-type: none"> - Boceprevir, an FDA-approved HCV drug, inhibits the enzymatic activity of Mpro with IC50 of 4.13 μM, and has an EC50 of 1.90 μM against the SARS-CoV-2 virus in the cellular viral CPE assay. - GC-376, an investigational veterinary drug, showed promising antiviral activity against the SARS-CoV-2 virus (EC50 = 3.37 μM). It has the highest enzymatic inhibition against the Mpro with an IC50 value of 0.03 μM. The X-ray crystal structure of SARS-CoV-2 Mpro in complex with GC-376 provides a molecular explanation of the high binding affinity of aldehyde-containing compounds as they can adopt two configurations R and S. - 3 calpain/cathepsin inhibitors, MG-132, calpain inhibitors II and XII, are potent inhibitors of Mpro with single-digit to submicromolar efficacy in the enzymatic assay. Calpain inhibitors II and XII also inhibit SARS-CoV-2 in the CPE assay with EC50 values of 2.07 and 0.49 μM, respectively. - Ritonavir and lopinavir failed to inhibit the SARS-CoV-2 Mpro (IC50 > 20 μM), which might explain why they lack efficacy in clinical trials for COVID-19. - Camostat has no inhibition against the SARS-CoV-2 Mpro (IC50 > 20 μM).

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SCIENCE 12JUN2020	The impact of COVID-19 and strategies for mitigation and suppression in low- and middle-income countries	Walker et al., UK, USA gotopaper	Public Helath/Epidemio	<p>Combining data on demography, contact patterns, disease severity, and health care capacity and quality to understand its impact and inform strategies for its control</p> <p>-> Younger populations in lower income countries may reduce overall risk</p> <p>-> Limited health system capacity coupled with closer inter-generational contact largely negates this benefit.</p> <p>-> Mitigation strategies that slow but do not interrupt transmission will still lead to COVID-19 epidemics rapidly overwhelming health systems, with substantial excess deaths in lower income countries due to the poorer health care available.</p>
The Lancet 11JUN2020	Seroprevalence of anti-SARS-CoV-2 IgG antibodies in Geneva, Switzerland (SEROCoV-POP): a population-based study	Stringhini, S. et al. Switzerland gotopaper	Public Health/Epidemio	<p>In SEROCov-POP, a population-based study, we planned a series of 12 consecutive weekly serosurveys of anti-SARS-CoV-2-IgG antibodies among randomly selected participants and their household members in Geneva, Switzerland (2766 participants from 2339 households), and estimated the seroprevalence in the population. We present results from the first 5 weeks of the study.</p> <p>- In the first week, we estimated a seroprevalence of 4.8%. The estimate increased to 8.5% in the second week, to 10.9% in the third week, 6.6% in the fourth week, and 10.8% in the fifth week.</p> <p>- Individuals aged 5–9 years and those older than 65 years had a significantly lower risk of being seropositive than those aged 20–49 years. We estimated that for every reported confirmed case, there were 11.6 infections in the community.</p> <p>These results suggest that most of the population of Geneva remained uninfected during this wave of the pandemic. Assuming that the presence of IgG antibodies is associated with immunity, these results highlight that the epidemic is far from coming to an end by means of fewer susceptible people in the population.</p>
The Journal of clinical investigation 11JUN2020	Early safety indicators of COVID-19 convalescent plasma in 5,000 patients	Joyner, Michael J et al. USA gotopaper	Therapeutic	<p>Analysis of key safety metrics after transfusion of ABO compatible human COVID-19 convalescent plasma in 5,000 hospitalized adults with severe or life threatening COVID-19, with 66% in the intensive care unit, as part of the US FDA Expanded Access Program for COVID-19 convalescent plasma.</p> <p>- Incidence of all serious adverse events (SAEs) in the first four hours after transfusion was <1% (n=36), including mortality rate (0.3%).</p> <p>- Of the 36 reported SAEs, there were 25 reported incidences of related SAEs, including mortality (n = 4), transfusion-associated circulatory overload (TACO; n = 7), transfusion-related acute lung injury (TRALI; n = 11), and severe allergic transfusion reactions (n = 3).</p> <p>- Only 2 (of 36) SAEs were judged as definitely related to the convalescent plasma transfusion by the treating physician.</p> <p>- The seven-day mortality rate was 14.9%.</p> <p>⇒ no signal of toxicity beyond what is expected from plasma use in severely ill patients</p> <p>⇒ mortality rate does not appear excessive</p> <p>These early indicators suggest that transfusion of convalescent plasma is safe in hospitalized patients with COVID-19.</p>

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PSYCHOLOGICAL MEDICINE 10JUN2020	Health-protective behaviour, social media usage, and conspiracy belief during the COVID-19 public health emergency	Allington D et al. UK gotopaper	SHS/SciPo	<p>> Social media platforms are major disseminators of health misinformation</p> <p>> Spread of COVID-19 is subject of conspiracy theories on social media.</p> <p>Methods</p> <p>> 3 questionnaire surveys of social media use, conspiracy beliefs, and health-protective behaviours with regard to COVID-19 (N = 949, 2250 N=2254; UK) Results</p> <p>> negative relationship between COVID-19 conspiracy beliefs and COVID-19 health-protective behaviours,</p> <p>> positive relationship between COVID-19 conspiracy beliefs and use of social media as a source of information about COVID-19.</p> <p>Conclusions</p> <p>Unregulated social media may present a health risk partly reducible to their role as disseminators of health-related conspiracy beliefs.</p>
Nature 09JUN2020	Clinical benefit of remdesivir in rhesus macaques infected with SARS-CoV-2	Williamson BN et al USA gotopaper	Therapeutic	<p>Rhesus macaque model of SARS-CoV-2 infection → develop mild to moderate disease</p> <p>2 group of 6 macaque were inoculated:</p> <ul style="list-style-type: none"> - 12 hours after 1 received remdesivir IV and 1 received vehicle solution - Assigned a daily clinical score sheet in a blinded fashion, 12 hours after inoculation <p><u>Animal treated with remdesivir → 12 hours after inoculation:</u></p> <ul style="list-style-type: none"> - Clinical scores were significantly lower than in control animals - Reduced pulmonary infiltrate on radiographs - Reduced virus titers in bronchoalveolar lavage - Reduction in damage to the lung significantly at necropsy <p>Absence of resistance mutation in all remdesivir-treated animals</p> <p>No reduction in virus shedding</p> <p>→The first antiviral treatment with proven efficacy against SARS-CoV-2 in an animal model</p> <p>→ Early remdesivir treatment initiation in COVID-19 patients prevent progression to pneumonia</p>
European journal of emergency medicine 08JUN2020	COVID-19 epidemic in the Seine-Saint-Denis Department of Greater Paris: one month and three waves for a tsunami	Lapostolle, F. et al. France gotopaper	Public Health/Epidemiology	<p>It is proposed that the chronology of epidemic spread gives a window of time in which hospitals can act to prevent reaching capacity. The number of patients managed, of patients transferred to emergency departments (ED), and of mobile intensive care units (MICUs) dispatched in the department of Seine-Saint-Denis between February 17th and March 28th was compared to a reference period of 5 years (2015-2019). The alert threshold to indicate a public health crisis was defined as a 20% increase compared to the 5-year mean.</p> <ul style="list-style-type: none"> - The daily numbers of patients managed crossed the threshold on February 25th and increased until the end of the study period. - The daily number of patients transferred to ED crossed the threshold on March 16th and increased until the end of the period. - The daily number of MICUs dispatched crossed the threshold on March 15th and increased until the end of the period. <p>The COVID-19 epidemic reached the department in three consecutive waves, and the first wave preceded by 30 days the massive arrival of critical patients. Health care systems must take advantage of this delay to prepare for the next wave.</p>

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Intensive Care Medicine 08JUN2020	Hydroxychloroquine pharmacokinetic in COVID-19 critically ill patients: an observational cohort study	Painvin B et al France gotopaper	Therapeutic	<p>HCQ pharmacokinetic in COVID-19 critically ill patients Oral loading dose: 400 mg or 200 mg if AKI and after 200mg t.i.d or 200mg b.i.d if AKI Measure daily blood trough and peak concentration of HCQ → evaluation of PK parameters Target HCQ concentration: 1 to 2 mg/L</p> <p>8 patients: median age was 59 (IQR:53 – 70) – 5 with AKI and 1 with ECLS – all under MV – SOFA score at admission was 5 [3 – 7] Analysis of 212 HCQ levels Median HCQ peak concentration after loading dose: 0,5mg/L or 0,22mg/L (AKI) Median time to obtain target concentration: 4 days [3 – 7] Median duration in therapeutic range: 3,3 days Toxic levels were noted after day 5 of treatment → drug accumulation and high volume of distribution</p> <p>→ prescribing HCQ in COVID-19 patients if unsafe → monitoring of electrocardiogram and blood concentration daily</p>
Chest 08JUN2020	Tocilizumab treatment for cytokine release syndrome in hospitalized COVID-19 patients: survival and clinical outcomes	Price C et al USA gotopaper	Therapeutic	<p>Observational study – Patient were treated with tocilizumab using an algorithm that targeted cytokine release syndrome (CRS) Algorithm developed by a multidisciplinary team 239 patients included– age median: 64 years</p> <p>153 were treated with tocilizumab Patient with severe disease were significantly more likely to:</p> <ul style="list-style-type: none"> - Have higher admission hsCRP levels (120 vs 71 mg/L, $p<0,001$) - Have Abnormal chest radiographs - Received tocilizumab (90% vs 44%, $p<0,001$) - Received tocilizumab sooner (2 vs 3 days, $p<0,01$) <p>14-days survival was 84% for patients treated with tocilizumab:</p> <ul style="list-style-type: none"> - Not differ by disease severity (83% vs 91%, $p=0,11$) - Mechanical ventilation (MV) occurred in 31% of patients treated with tocilizumab <p><u>After tocilizumab</u></p> <ul style="list-style-type: none"> - Improve of inflammatory biomarkers (hsCRP, IL-6) and oxygenation - D-dimer increased significantly - Few adverse events <p>→ Tocilizumab to target CRS may influence MV and survival outcomes → Need for randomized trials</p>
Intensive Care Medecine 8JUN2020	Severe COVID-19 is associated with deep and sustained multifaceted cellular immunosuppression	Jeannet et al., France gotopaper	Immuno	<p>This French study conducted on 13 consecutively recruited patients infected with SARS-CoV-2 virus during their first week of ICU stay with 10 healthy donors used as controls confirms that patients uniformly exhibited deep global and persisting T, NK and B cell lymphopenia from ICU admission to day 7</p> <p>Interestingly the report indicated few CD4 T cells transiently expressed CTLA-4 during the first 3 days and expression of PD-1 observed at admission day increased until day 7 whereas CD8 T cells significantly expressed PD-1 from admission day to day 7 and CTLA-4 expression remained unchanged.</p> <p>Conclusion: These data strongly suggest a vicious effect of the virus to cause an upregulation of potent T cell killing and immunosuppressive mechanisms in critically-ill COVID-19 patients. This call into question therapies (e.g., anti-IL-6, corticosteroids, JAK inhibitors) that aim to block the ability of the patient to mount an effective immune response to the invading SARS-CoV-2.</p>

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PLOS ONE 08 JUN2020	Quantify the role of superspreaders -opinion leaders- on COVID-19 information propagation in the Chinese Sina-microblog	Yin F et al CHINA AND CANADA gotopaper	SHS/SciPo	<p>Background:</p> <ul style="list-style-type: none"> > the success of control of COVID-19 outbreak relies on the resilience of people to follow public health interventions ➢ evidence shows that opinion leaders play a significant role in the propagation of epidemic information and public health policy and implementations <p>Methods:</p> <ul style="list-style-type: none"> > “Opinion-leader susceptible-forwarding-immune (OL-SFI)” mathematical model to quantify the roles of information “superspreaders” ➢ analysis of the information propagation dynamics in the Chinese Sina -microblog. <p>Results:</p> <p>The earlier opinion leaders get into the public health intervention, the greater their influence will be on the population.</p>
PLoS biology 8JUN2020	A unifying structural and functional model of the coronavirus replication organelle: Tracking down RNA synthesis	Snijder, Eric J. <i>et al.</i> Netherlands gotopaper	Fundamental research	<p>Which replication organelle (RO) element(s) of infected cells accommodate CoV RNA synthesis remains unclear.</p> <ul style="list-style-type: none"> - 2D and 3D analyses of CoV ROs showed that diverse CoVs induce the same membrane modifications, including the small open double-membrane spherules (DMSs) (previously thought to be restricted to gamma- and delta-CoV infections). But RNA synthesis could not be linked to DMSs or any other cellular or virus-induced structure. - Abundant association of newly synthesized viral RNA with double-membrane vesicles (DMVs) detected in cells infected with the beta-CoV MERS-CoV and SARS-CoV, and gamma-CoV infectious bronchitis virus (Metabolic labelling by quantitative EM autoradiography). <p>-> Provides a unifying model of the CoV replication organelle and establish DMVs as the central hub for viral RNA synthesis and a potential drug target in CoV infection.</p>
Lancet 5JUN2020	Retraction: Hydroxychloroquine or chloroquine with or without a macrolide for treatment of COVID-19: a multinational registry analysis	Mandeep R Mehra et al. USA gotopaper	Therapeutic	<p>Unable to conduct an independent and private peer review to evaluate the origination of the database elements, to confirm the completeness of the database, and to replicate the analyses presented in the paper “Hydroxychloroquine or chloroquine with or without a macrolide for treatment of COVID-19: a multinational registry analysis”</p> <p>The raw data could not be made available to an independent third-party peer review</p> <p>Withdrawal of the article at the request of the authors</p>
NEJM 04JUN2020	Retraction: Cardiovascular Disease, Drug Therapy, and Mortality in Covid-19. N Engl J Med. DOI: 10.1056/NEJMoa2007621	Mehra MR et al USA gotopaper	Clinic	<p>Unable to validate the primary data source underlying the article “Cardiovascular Disease, Drug Therapy, and Mortality in Covid-19”</p> <p>The raw data could not be made available to a third-party auditor</p> <p>Withdrawal of the article at the request of the authors</p>

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Nature 8JUN2020	Estimating the effects of non-pharmaceutical interventions on COVID-19 in Europe	Flaxman, Seth et al. UK gotopaper	Therapeutic	<p>Study of the impact of major non-pharmaceutical interventions across 11 European countries for the period from the start of COVID-19 until the 4th of May 2020 when lockdowns started to be lifted. These large-scale non-pharmaceutical interventions vary between countries but include social distancing (such as banning large gatherings), border closures, school closures, measures to isolate symptomatic individuals and their contacts, and large-scale lockdowns of populations with all but essential internal travel banned.</p> <ul style="list-style-type: none"> - Estimate that, for all the countries considered, current interventions have been sufficient to drive the reproduction number R_t below 1 (probability $R_t < 1.0$ is 99.9%) and achieve epidemic control. - Estimate that, across all 11 countries, between 12 and 15 million individuals have been infected with SARS-CoV-2 up to 4th May, representing between 3.2% and 4.0% of the population. <p>=> Major non-pharmaceutical interventions and lockdown in particular have had a large effect on reducing transmission. Continued intervention should be considered to keep transmission of SARS-CoV-2 under control.</p>
Blood 08JUN2020	COVID and Coagulation: Bleeding and Thrombotic Manifestations of SARS-CoV2 Infection	Al-Samkari H et al USA gotopaper	Clinic	<p>Multicenter study – rate and severity of hemostatic and thrombotic complications</p> <p>400 patients COVID-19 receiving standard dose prophylactic anticoagulation</p> <p><u>Overall population:</u></p> <ul style="list-style-type: none"> - Radiographically-confirmed VTE rate: 4,8% [2,9 – 7,3] / Thrombotic complications rate: 9,5% [6,8 – 12,8] / Major bleeding rate: 2,3% [1,0 – 4,2] <p><u>Critically ill patients:</u></p> <ul style="list-style-type: none"> - Radiographically-confirmed VTE rate: 7,6% [3,9 – 13,3] / Major bleeding rate: 5,6% [2,4 – 10,7] <p><u>Predictive of coagulation-associated complications during hospitalization</u></p> <ul style="list-style-type: none"> - Elevated D-dimer at admission / Platelet count > $450 \times 10^9/L$ / CRP > 100mg/L / Erythrocyte sedimentation rate > 40mm/h <p>→ Randomized trials are needed to determine any potential benefit of intensified anticoagulation prophylaxis</p> <p>58 children in 8 hospitals in England with PIMS-TS</p> <p>→ Comparison with patients with KD (n=1132), KD shock syndrome (n=45) and toxic shock syndrome (n=37) admitted in US and Europe from 2002 to 2019</p> <p>Median age: 9 years [5,7 – 14] – 57% female</p> <p><u>Symptoms</u></p> <ul style="list-style-type: none"> - Fever with non-specific symptoms: vomiting – abdominal pain – diarrhea - / 52% rash & 45% conjunctival injection / 22% children met definition of KD (AHA) <p><u>Biology</u></p> <ul style="list-style-type: none"> - PCR SARS-CoV-2 positive 15/58 & SARS-CoV-2 IgG positive in 40 of 46 - 78% had evidence of current or prior infection of SARS-CoV-2 - High level of inflammatory markers (CRP, ferritin) <p><u>Outcomes</u></p> <ul style="list-style-type: none"> - 50% developed shock with evidence of left ventricular dysfunction whom 79% received mechanical ventilation / 14% developed coronary artery dilatation or aneurysm / No death <p><u>Comparison with KD and KD shock syndrome</u></p> <ul style="list-style-type: none"> - Older (9 vs 2,7 vs 3,8 respectively) - Greater elevation of inflammatory markers - Lower platelet count – higher fibrinogen levels and greater elevation of troponin <p>→ the comparison suggests this disorder differ from other pediatric inflammatory entities</p>
JAMA 08JUN2020	Clinical Characteristics of 58 Children with a Pediatric Inflammatory Multisystem Syndrome Temporally Associated With SARS-CoV-2	Whittaker E et al UK gotopaper	Clinic	<p>Median age: 9 years [5,7 – 14] – 57% female</p> <p><u>Symptoms</u></p> <ul style="list-style-type: none"> - Fever with non-specific symptoms: vomiting – abdominal pain – diarrhea - / 52% rash & 45% conjunctival injection / 22% children met definition of KD (AHA) <p><u>Biology</u></p> <ul style="list-style-type: none"> - PCR SARS-CoV-2 positive 15/58 & SARS-CoV-2 IgG positive in 40 of 46 - 78% had evidence of current or prior infection of SARS-CoV-2 - High level of inflammatory markers (CRP, ferritin) <p><u>Outcomes</u></p> <ul style="list-style-type: none"> - 50% developed shock with evidence of left ventricular dysfunction whom 79% received mechanical ventilation / 14% developed coronary artery dilatation or aneurysm / No death <p><u>Comparison with KD and KD shock syndrome</u></p> <ul style="list-style-type: none"> - Older (9 vs 2,7 vs 3,8 respectively) - Greater elevation of inflammatory markers - Lower platelet count – higher fibrinogen levels and greater elevation of troponin <p>→ the comparison suggests this disorder differ from other pediatric inflammatory entities</p>

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Lancet Infectious Disease 08JUN2020	Pulmonary post-mortem findings in a series of COVID-19 cases from northern Italy: a two-centre descriptive study	Carsana L et al Italy gotopaper	Clinic	<p>Analysis of lung tissue samples from 38 patients who died from COVID-19</p> <p>Diffuse alveolar damage:</p> <ul style="list-style-type: none"> - Capillary congestion (100%) - Necrosis of pneumocytes (100%) - Type 2 pneumocytes hyperplasia (100%) - Necrosis of hyaline membranes (87%) - Interstitial & intra-alveolar edema (97%) - Platelet-fibrin thrombi (87%) <p>→ presence of platelet–fibrin thrombi in small arterial vessels is consistent with coagulopathy</p> <p>→ same lesions in patients infected with SARS and MERS-CoV</p>
Science 08JUN2020	Genomic surveillance reveals multiple introductions of SARS-CoV-2 into Northern California	Deng, X. et al, USA gotopaper	Public Health/Epidemiology	<p>Investigation of the genomic epidemiology of SARS-CoV-2 in Northern California from late January to mid-March 2020, using samples from 36 patients spanning 9 counties and the Grand Princess cruise ship.</p> <ul style="list-style-type: none"> - Phylogenetic analyses revealed the cryptic introduction of at least 7 SARS-CoV-2 lineages into California, including epidemic WA1 strains associated with Washington State, with lack of a predominant lineage and limited transmission between communities. - Lineages associated with outbreak clusters in 2 counties were defined by a single base substitution in the viral genome. <p>These findings support contact tracing, social distancing, and travel restrictions to contain SARS-CoV-2 spread.</p>
Nature 08JUN2020	The effect of large-scale anti-contagion policies on the COVID-19 pandemic	Hsiang S. et al, USA gotopaper	Public Health/Epidemiology	<p>Reduced-form econometric methods are applied to empirically evaluate the effect of policies on the growth rate of infections, using new data on 1,717 local, regional, and national non-pharmaceutical interventions deployed in the Covid-19 pandemic across China, South Korea, Italy, Iran, France, and the US.</p> <ul style="list-style-type: none"> - In the absence of policy actions, early infections exponential growth rates are estimated at roughly 38% per day. - Anti-contagion policies have significantly and substantially slowed this growth: interventions prevented or delayed on the order of 62 million confirmed cases, corresponding to averting roughly 530 million total infections. <p>These findings may help inform whether or when these policies should be deployed, intensified, or lifted</p>
Journal of the American College of Cardiology 08JUN2020	Prevalence and Impact of Myocardial Injury in Patients Hospitalized with COVID-19 Infection	Lala A. et al, USA gotopaper	Public Health/Epidemiology	<p>AIM: Describing the degree of myocardial injury and associated outcomes in a hospitalized cohort with COVID-19 (n=2,736), based on troponin-I measures (normal value <0.03ng/mL).</p> <ul style="list-style-type: none"> - Cardiovascular disease (CVD; coronary artery disease, atrial fibrillation, and heart failure), hypertension and diabetes were more prevalent in patients with higher troponin concentrations. - 506 (18.5%) patients died during hospitalization. In all, 985 (36%) patients had elevated troponin concentrations. - After adjusting for disease severity and relevant clinical factors, even small amounts of myocardial injury (troponin I 0.03-0.09ng/mL) were significantly associated with death, while greater amounts (troponin I >0.09 ng/dL) were significantly associated with higher risk. <p>Myocardial injury is prevalent among patients hospitalized with COVID-19 however troponin concentrations were generally low.</p>

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J Med Virol 5JUN2020	Identification of nsp1 gene as the target of SARS-CoV-2 real-time RT-PCR using nanopore whole genome sequencing	Chan, Wan-Mui et al. Hong Kong gotopaper	Virology	<p>There is an increasing number of SARS-CoV-2 viruses with mutations at the primer or probe binding sites. These mutations may affect the sensitivity of RT-PCR) assays targeting the N, E, and ORF1a/b genes.</p> <p>=> Using sequence-independent single-primer amplification (SISPA) and nanopore whole-genome sequencing, we have found that the nsp1 gene, located at the 5' end of the SARS-CoV-2 genome, was highly expressed in the nasopharyngeal or saliva specimens of 9 COVID-19 patients of different clinical severity.</p> <p>=> we have developed a novel nsp1 real-time RT-PCR assay. The primers and probes are highly specific for SARS-CoV-2.</p> <p>Results: Validation with 101 clinical specimens showed that our nsp1 RT-PCR assay has a sensitivity of 93.1% (95% confidence interval, 86.2-97.2%), which was similar to those of N and E gene RT-PCR assays. The diagnostic specificity was 100% (95% CI, 92.9-100%)</p> <p>Conclusion: The addition of nsp1 for multi-target detection of SARS-CoV-2 can avoid false negative results due to mutations at the primers/probes binding sites of currently available RT-PCR assays.</p> <p>Limitations: There can still be bias during the library preparation which may affect the coverage of each position in the viral genome + our nanopore sequencing did not encompass phylogenetic type C strains, which is mainly found in Europe and in America.</p>
Med 5JUN2020	Outcomes of hydroxychloroquine usage in United States veterans hospitalized with COVID-19	Magagnoli, Joseph et al. USA gotopaper	Therapeutic	<p>Retrospective study of electronic health records of 807 US veterans patients hospitalized with confirmed SARS-CoV-2 infection to analyze the associations between hydroxychloroquine and azithromycin use and clinical outcome.</p> <p>The primary outcomes were mortality and use of mechanical ventilation.</p> <p>- Compared to the no HC group, after propensity score adjustment for clinical characteristics, the risk of death from any cause was higher in the HC group (adjusted hazard ratio (aHR), 1.83; 95% CI, 1.16 to 2.89; P=0.009) but not in the HC+AZ group (aHR, 1.31; 95% CI, 0.80 to 2.15; P=0.28).</p> <p>- Both the propensity score-adjusted risks of mechanical ventilation and death after mechanical ventilation were not significantly different in the HC group (aHR, 1.19; 95% CI, 0.78 to 1.82; P=0.42 and aHR, 2.11; 95% CI, 0.96 to 4.62; P=0.06, respectively) or in the HC+AZ group (aHR, 1.09; 95% CI, 0.72 to 1.66; P=0.69 and aHR, 1.25; 95% CI, 0.59 to 2.68; P=0.56, respectively), compared to the no HC group.</p> <p>Limitations: non-randomization of treatments; demographic composition of patients (US veterans) with a majority of men and majority of black.</p>
HEART FAILURE JUN2020	Incidence of New-Onset and Worsening Heart Failure Before and After the COVID-19 Epidemic Lockdown in Denmark	Andersson C et al, DENMARK gotopaper	Public Health/Epidemiology	<p>Consequences of the lockdown for patients with heart failure (Cohort Study in Denmark)</p> <p>> Incidence of new onset HF and hospitalizations for worsening HF before and after the lockdown (2019 vs 2020, same period)</p> <p>Results:</p> <p>1. Before lockdown:</p> <p>> Rates of new-onset HF before lockdown were comparable for 2020 and 2019 / Hospitalizations for worsening HF were slightly higher in 2020 versus 2019 in</p> <p>2. During lockdown:</p> <p>> Rates of new-onset HF diagnoses and of hospitalizations for worsening HF significantly lower in 2020 versus 2019 / Similar mortality before and after lockdown for the population with HF.</p> <p>Conclusions:</p> <p>> These data raise concerns for a potential undertreatment of HF currently that may impact prognosis in the longer term</p>

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<p>JOURNAL OF MEDICAL INTERNET RESEARCH 05JUN2020</p>	<p>COVID-19-Related Information Sources and the Relationship With Confidence in People Coping with COVID-19: Facebook Survey Study in Taiwan</p>	<p>Wang PW et al. TAIWAN gotopaper</p>	<p>SHS/SciPo</p>	<p>Objectives: to examine major COVID-19 information sources of people in coping with COVID-19 in Taiwan.</p> <p>Methods:</p> <ul style="list-style-type: none"> ➤ 1904 participants (1270 non–health-care workers (HCW) and 634 HCW) recruited from Facebook advertisement. ➤ surveyed sources of information: internet (blogs, internet news, and social media: Facebook, Line, Twitter, and Plurk), friends, traditional media (television, newspapers, and radio broadcasting) and formal lesson on COVID19 ➤ Participants rated their frequency for each source, and responded to question on self-confidence and worries in coping with COVID19 <p>Results:</p> <ul style="list-style-type: none"> ➤ Sources of information by order of acces: internet (80%) followed by followed by traditional media, family members, coworkers, friends, formal lessons, and medical staff. > 50% of participant consulted one or two sources. 10% zero. ➤ for HCW: the use of formal lessons as an information source was associated with better self-confidence in coping with COVID-19 ➤ association between receiving information from more sources and greater self-confidence found in HCW, but not in other groups <p>Conclusions:</p> <ul style="list-style-type: none"> > internet is a popular and accessible information source, but misinformation on COVID-19 is rife > severe worry is associated with using more information sources. <p>Medical professionals should consider that when delivering information online.</p>
<p>Sci. Total Environ. 5JUN2020</p>	<p>Comparison of virus concentration methods for the RT-qPCR-based recovery of murine hepatitis virus, a surrogate for SARS-CoV-2 from untreated wastewater</p>	<p>Ahmed, Warish et al. Australia gotopaper</p>	<p>Public Health</p>	<p>There is currently a clear benefit for many countries to utilize wastewater-based epidemiology (WBE) as part of ongoing measures to manage the COVID-19 global pandemic. It is imperative to determine the efficiency of the most commonly used methods for the enveloped SARS-CoV-2.</p> <p>⇒ Municipal wastewater seeded with a human coronavirus (CoV) surrogate, murine hepatitis virus (MHV), was used to test the efficiency of seven wastewater virus concentration methods: (A–C) adsorption-extraction with three different pre-treatment options, (D–E) centrifugal concentration device methods with two different devices, (F) polyethylene glycol (PEG 8000) concentration, and (G) ultrafiltration. MHV was quantified by reverse-transcription quantitative polymerase chain reaction and the concentration efficiency was calculated for each method.</p> <p>Results: the most efficient methods were (B) Adsorption-extraction methods, with MgCl₂ pre-treatment.</p> <p>CI^o: absorption-extraction methods with minimal pretreatment or without manipulation can provide suitably rapid, cost-effective and relatively straightforward recovery of enveloped viruses in wastewater. The MHV is a promising process control for SARS-CoV-2 surveillance and can be used as a quality control measure to support community-level epidemic mitigation and risk assessment.</p>

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CELL 4JUN2020	Development of an inactivated vaccine candidate, BBIBP-CorV, with potent protection against SARS-CoV-2	Wuang H et al_China gotopaper	Vaccin	<p>BBIBP-CorV inactivated SARS-CoV-2 vaccine candidate: 3 viral strains isolated from BAL or throat swabs from 3 hospitalized patients in Vero cells. > The strain showing the most optimal replication rates and highest virus yield was selected.</p> <p>Immunogenicity tests: In mice: BalbC injected with 2, 4, 8 ug/dose of BBIBP-CorV +aluminium hydroxide adjuvant. > One/Two/three dose programmes: High seroconversion rate in the three groups at D7. Better NAb production in three dose program as evaluated at D28 In rabbits, guinea pigs, rats and NHP: good immunogenicity and seroconversion rates in a two-dose vaccination program. Protection in NHP Immunization of NHP with BBIBP-CoV-2 after intratracheal challenge: 2 doses ; 2ug/dose > highly efficient protection against SARS-CoV-2 > viral clearance in lungs, throat and and swabs > no side effects on serum biochemical parameters >no ADE</p> <p>Safety evaluation in rat showed no specific concerns BBIBP-CorV exhibits efficient productivity and good genetic stability for vaccine manufacture</p>
Allergy 4JUN2020	Distribution of ACE2, CD147, CD26 and other SARS-CoV-2 associated molecules in tissues and immune cells in health and in asthma, COPD, obesity, hypertension, and COVID-19 risk factors	Radzikowska, U. et al. Switzerland-Poland-China-Norway-Japan-Germany-USA-Ireland gotopaper	Fundamental research	<p>Gene expression analysis (RNA sequencing and RNA-Seq databases) of SARS-CoV-2 receptors and related molecules in collection of primary human cells and tissues from healthy (children and adults) and adult patients with risk factors and known comorbidities of COVID-19: (ACE2, CD147 (BSG), CD26 (DPP4), and their direct and indirect cellular partners in primary human bronchial epithelial cells, bronchial and skin biopsies, bronchoalveolar lavage fluid, whole blood, PBMCs, monocytes, neutrophils, DCs, NK cells, ILC1, ILC2, ILC3, CD4+ and CD8+ T cells, B cells and plasmablasts)</p> <ul style="list-style-type: none"> - ACE2 and TMPRSS2 co-expressed at epithelial sites of lung and skin, - CD147, cyclophilins (<i>PP1A</i> and <i>PP1B</i>), CD26 and related molecules expressed in both epithelium and in immune cells. - Distinct age-related expression profile of these genes in the PBMCs and T cells from healthy children and adults. - Higher expression of ACE2- and CD147-related genes generally in asthma, COPD, hypertension, smoking, obesity, and male gender in the bronchial biopsy, BAL or blood. - CD147-related genes correlated positively with age and BMI. <p>-> Different receptor repertoire potentially involved in the SARS-CoV-2 infection at the epithelial barriers and in the immune cells. Altered expression of these receptors related with age, gender, obesity and smoking, as well as with the disease status might contribute to COVID-19 morbidity and severity patterns.</p>
The Lancet Rheumatology 4JUN2020	Canakinumab in a subgroup of patients with COVID-19	Ucciferri, Claudio et al. Italie/USA gotopaper	Therapeutic	<p>Retrospective analysis of 10 hospitalized patients with confirmed SARS-CoV-2 infection, bilateral pneumonia, hyperinflammation (defined as serum C-reactive protein ≥ 50 mg/L), and respiratory failure (requiring supplemental oxygen without invasive ventilation). These patients were treated with canakinumab, a human monoclonal antibody against IL-1β. All patients also received hydroxychloroquine and lopinavir–ritonavir.</p> <p>Canakinumab was safe, well tolerated, and associated with a rapid reduction in the systemic inflammatory response and an improvement in oxygenation compared to controls. Notably, none of the patients developed neutropenia or bacterial sepsis.</p> <p>Limitations: small sample size and absence of a random comparison.</p>

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<p>JAMA 3JUN2020</p>	<p>Effect of Convalescent Plasma Therapy on Time to Clinical Improvement in Patients With Severe and Life-threatening COVID-19: A Randomized Clinical Trial</p>	<p>Li, Ling et al. China gotopaper</p>	<p>Therapeutic</p>	<p>Open-label, multicenter, randomized clinical trial including 103 participants with laboratory-confirmed COVID-19 severe (respiratory distress and/or hypoxemia) or life-threatening (shock, organ failure, or requiring mechanical ventilation) treated with Convalescent plasma in addition to standard treatment vs standard treatment alone (stratified by disease severity). The trial was terminated early after 103 of a planned 200 patients were enrolled. Primary outcome was time to clinical improvement within 28 days. Secondary outcomes included 28-day mortality, time to discharge, and the rate of viral PCR results turned from positive at baseline to negative at up to 72 hours.</p> <ul style="list-style-type: none"> - Clinical improvement occurred within 28 days in 51.9% of the convalescent plasma group vs 43.1% in the control group (difference, 8.8% [95% CI, -10.4% to 28.0%]; hazard ratio [HR], 1.40 [95% CI, 0.79-2.49]; P = .26). Among those with severe disease, the primary outcome occurred in 91.3% (21/23) of the convalescent plasma group vs 68.2% (15/22) of the control group (HR, 2.15 [95% CI, 1.07-4.32]; P = .03); among those with life-threatening disease the primary outcome occurred in 20.7% (6/29) of the convalescent plasma group vs 24.1% (7/29) of the control group (HR, 0.88 [95% CI, 0.30-2.63]; P = .83) (P for interaction = .17). - There was no significant difference in 28-day mortality (15.7% vs 24.0%; OR, 0.65 [95% CI, 0.29-1.46]; P = .30) or time from randomization to discharge (51.0% vs 36.0% discharged by day 28; HR, 1.61 [95% CI, 0.88-2.93]; P = .12). - Convalescent plasma treatment was associated with a negative conversion rate of viral PCR at 72 hours in 87.2% of the convalescent plasma group vs 37.5% of the control group (OR, 11.39 [95% CI, 3.91-33.18]; P < .001). - Two patients in the convalescent plasma group experienced adverse events within hours after transfusion that improved with supportive care. <p>=> Among patients with severe or life-threatening COVID-19, convalescent plasma therapy added to standard treatment, compared with standard treatment alone, did not result in a statistically significant improvement in time to clinical improvement within 28 days. Interpretation is limited by early termination of the trial, which may have been underpowered to detect a clinically important difference.</p>
<p>Biosensors and Bioelectronics JUN2020</p>	<p>Homogeneous circle-to-circle amplification for real-time optomagnetic detection of SARS-CoV-2 RdRp coding sequence</p>	<p>Tian, Bo et al. Denmark gotopaper</p>	<p>Diagnostic</p>	<p>Circle-to-circle amplification (C2CA) is a specific and precise cascade nucleic acid amplification method consisting of more than one round of padlock probe ligation and rolling circle amplification (RCA). We herein demonstrate a homogeneous and isothermal nucleic acid quantification strategy based on C2CA and optomagnetic analysis of magnetic nanoparticle (MNP) assembly. -> eliminates the need for additional monomerization and ligation steps after the first round of RCA, and combines two amplification rounds in a one-pot reaction. -> Applied for the detection of a synthetic complementary DNA of SARS-CoV-2 RdRp (RNA-dependent RNA polymerase) coding sequence, achieving a detection limit of 0.4 fM with a dynamic detection range of 3 orders of magnitude and a total assay time of ca. 100 min. A mathematical model was set up and validated to predict the assay performance.</p> <p>Conclusion: Reaches a sub-femtomolar level detection limit and significantly simplified the operation by eliminating the labor-intensive and time-consuming operation steps requiring different reaction temperatures. Capability of target quantification in 10% FBS samples was demonstrated with an acceptable loss of sensitivity.</p>

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J. Infect. 3JUN2020	Detection of SARS-CoV-2 antibodies using commercial assays and seroconversion patterns in hospitalized patients	Tuaille, E. et al. France gotopaper	Diagnostic	<p>SARS-CoV-2 antibody assays are needed for serological surveys and as a complement to molecular tests to confirm COVID-19. However, the kinetics of the humoral response against SARS-CoV-2 remains poorly described and relies on the performance of the different serological tests. => Evaluation of performance of six CE-marked point-of-care tests (POC) and three ELISA assays for the diagnosis of COVID-19 by exploring seroconversions in hospitalized patients who tested positive for SARS-CoV-2 RNA.</p> <p>Results: our study is one of the very first to evaluate the performance of commercial SARS-CoV-2 serologic assays. The second week of COVID-19 seems to be the best period for assessing the sensitivity of commercial serological assays.</p> <p>CI°: serological assays may be useful in the diagnosis of patients with acute respiratory distress syndrome and a negative PCR assay Seroconversions occur during the second week of the disease. To achieve an early diagnosis of COVID-19 based on antibody detection, a dual challenge must be met: the immunodiagnostic window period must be shortened and an optimal specificity must be conserved</p> <p>Limitations: relatively small number of plasma samples -> the estimation of sensitivity and specificity values are relatively imprecise. Patients with moderate to severe COVID-19 -> intensity of the humoral response to SARS-CoV-2 N or S proteins may be lower in asymptomatic or paucity symptomatic cases.</p>
NEJM 03JUN2020	A Randomized Trial of Hydroxychloroquine as Postexposure Prophylaxis for Covid-19	David R. Boulware et al. USA/Canada gotopaper	Therapeutic	<p>Randomized, double-blind, placebo-controlled trial to evaluate postexposure prophylaxis with hydroxychloroquine after exposure to Covid-19. Participants had known exposure (by participant report) to a person with laboratory-confirmed Covid-19, whether as a household contact, a health care worker, or a person with other occupational exposures. The primary outcome was the incidence of either laboratory-confirmed Covid-19 or illness compatible with Covid-19 within 14 days.</p> <p>821 asymptomatic adult participants were randomly assigned to the hydroxychloroquine group (414 participants) or the placebo group (407 participants). Overall, 87.6% of the participants (719 of 821) had high-risk exposures without eye shields and surgical masks or respirators.</p> <p>- The incidence of new illness compatible with Covid-19 did not differ significantly between participants receiving hydroxychloroquine (49 of 414 [11.8%]) and those receiving placebo (58 of 407 [14.3%]); the absolute difference was -2.4 percentage points (95% confidence interval, -7.0 to 2.2; P=0.35). - Side effects were more common with hydroxychloroquine than with placebo (40.1% vs. 16.8%), but no serious adverse reactions were reported.</p> <p>Conclusion: high doses of hydroxychloroquine did not prevent illness compatible with Covid-19 when initiated within 4 days after a high-risk or moderate-risk exposure.</p> <p>Limitation: a priori symptomatic case definition used because majority of the participants, including health care workers, were unable to access testing ; Internet-based approach used to rapidly recruit participants in the context of a pandemic, data were obtained by means of participant report ; predictive power of the case definition is unknown, particularly in the younger populations studied.</p>

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The Lancet Public Health 02JUN2020	Effects of non-pharmaceutical interventions on COVID-19 cases, deaths, and demand for hospital services in the UK: a modelling study	Davies, N.G., et al. UK gotopaper	Public Health/Epidemiology	<p>Assessment of the potential impact of control measures for COVID-19 in the UK, using a stochastic age-structured transmission model tracking 66.4 million people. Interventions modelled were school closures, physical distancing, shielding of people aged >70, and self-isolation of symptomatic cases, a combination of the four, as well as lockdown. Estimations of new cases, patients requiring ICU admission, death and R0 were calculated.</p> <ul style="list-style-type: none"> - The median unmitigated burden was of 23 million clinical cases and 350 000 deaths in the UK by December 2021. - The four base interventions were each likely to decrease R0, but not sufficiently to prevent ICU demand from exceeding health service capacity. Only lockdown periods were sufficient to bring R0 near or below 1. - The most stringent lockdown scenario resulted in a projected 120 000 cases and 50 000 deaths. <p>Intensive interventions with lockdown periods would need to be in place for a large proportion of the coming year to prevent health-care demand exceeding availability</p> <p>Hypothesis: ACE-inhibitors (ACEi) and Angiotensin-2 Blockers (ARB), commonly used in patients with hypertension or diabetes and may raise tissue ACE2 levels, could increase the risk of severe COVID19 infection.</p>
European journal of heart failure 2JUN2020	ACE-inhibitors and Angiotensin-2 Receptor Blockers are not associated with severe SARS-COVID19 infection in a multi-site UK acute Hospital Trust	Bean, Daniel M. et al. UK gotopaper	Clinic	<p>Consecutive cohort of 1200 acute COVID19 inpatients (2 hospitals) with multi-ethnic catchment population in London:</p> <ul style="list-style-type: none"> - Mean age: 68 ± 17 years (57% male); 74% of patients with at least 1 comorbidity. - 34.6% reached the primary endpoint of death or transfer to a critical care unit for organ support within 21-days of symptom onset. - 33.3% were taking ACEi or ARB (significantly older and more comorbidities). - → Odds ratio for the primary endpoint in patients on ACEi and ARB, after adjustment for age, sex and co-morbidities, was 0.63 (CI 0.47-0.84, p < 0.01). - → No evidence for increased severity of COVID19 disease in hospitalised patients on chronic treatment with ACEi or ARB. <p>A trend towards a beneficial effect of ACEi/ARB requires further evaluation in larger meta-analyses and randomised clinical trials.</p>
Cell Systems 02JUN2020	Ultra-high-throughput clinical proteomics reveals classifiers of COVID-19 infection	Messner et al., UK, Germany, Sweden gotopaper	Diagnostic	<ul style="list-style-type: none"> - A standardized, ultra-highthroughput clinical platform for serum and plasma proteomics - Platform enables high precision quantification of 180 patient samples/day at low cost - 27 biomarkers are differentially expressed between WHO severity grades for COVID-19 - Biomarkers include proteins not previously associated with COVID-19 infection
The Lancet Psy 2JUN2020	Global mental health and COVID-19	Lola Kola, Nigeria gotopaper	Psy	<p>Disruption of mental health, in particular in LMICs.</p> <p>Two successful global mental health strategies:</p> <ol style="list-style-type: none"> 1- Task shifting—the use of trained lay health workers to deliver health care in non-specialist settings (can be used to address the urgent need to build a provider base in developing countries) 2- Use of digital health technology to strengthen health systems (use of mobile phone for health interventions in LMICs) -> to increase access and coverage in hard-to-reach areas calls for more research on their effectiveness in LMICs - <ul style="list-style-type: none"> -> the <i>Lancet</i> Commission on global mental health recommended adoption of digital interventions alongside traditional treatments/ -> Efforts to respond to mental health needs present researchers with an important opportunity to build on what we know and advance progress in achieving the mental health objectives of universal health coverage.

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Lancet 01JUN2020	Physical distancing, face masks, and eye protection to prevent person-to-person transmission of SARS-CoV-2 and COVID-19: a systematic review and meta-analysis	Chu et al, Canada gotopaper	Public Health/Epidemio	<p>Aim: to investigate the effects of physical distance, face masks, and eye protection on virus transmission in health-care and community settings, through a systematic review and meta-analysis of 172 observational studies (25 697 patients in total).</p> <ul style="list-style-type: none"> - Transmission of viruses was lower with physical distancing of 1 m or more, compared with a distance of less than 1. protection was increased as distance was lengthened. - Face mask use resulted in a large reduction in risk of infection, with stronger associations with N95 or similar respirators compared with disposable surgical masks or similar. - Eye protection was associated with less infection <p>These findings support physical distancing of 1 m or more and provide quantitative estimates for models and contact tracing to inform policy.</p>
Eur. Respir. J. 01JUN2020	Estimates of the ongoing need for social distancing and control measures post-"lockdown" from trajectories of COVID-19 cases and mortality	Loneragan, M., Chalmers, J.D. UK gotopaper	Public Health/Epidemio	<p>Predictions on trajectories, doubling times and R0 of Covid-19 under social distancing and lockdown measures, based on new cases and mortality data in 89 countries up to May 21st 2020</p> <ul style="list-style-type: none"> - Estimates of R0 before lockdown was between 2.0 and 3.7 (USA, Italy, Spain, France and UK). There was little evidence that the restrictions had reduced R far below 1 in many places (France showed the most rapid reductions - R0 0.76, based on cases and 0.77 based on mortality). - With an intermittent lockdown strategy, few countries could have even 1 week per month unrestricted without resurgence of the epidemic. - Restoring 20% of the activity that has been prevented by the lockdowns does not reconcile with preventing the resurgence of the disease in most countries.
Nature Communications 01JUN2020	Two linear epitopes on the SARS-CoV-2 spike protein that elicit neutralizing antibodies in COVID-19 patients	Poh, Chek Meng et al; Singapore gotopaper	Immuno	<p>Identification of immunogenic targets against the coronavirus spike glycoprotein</p> <ul style="list-style-type: none"> • In this study, using pools of overlapping linear B-cell peptides, two immunodominant linear B-cell epitopes on the S glycoprotein of SARS-CoV-2 were identified. SP14P5 is located in close proximity to the receptor binding domain whereas S21P2 is in the region that encompasses the fusion peptide, which is highly conserved among coronaviruses suggesting a potential pan-SARS epitope at this location. • Detection for both S14P5 and S21P2 was consistently and significantly higher in COVID-19 patients • Interestingly, antibody depletion assays demonstrate that antibodies recognized these two linear epitopes and can neutralise SARS-CoV-2. <p>Conclusion: SP14P5 et S21P2 epitopes can potentially be used in the design of more sensitive serological assays for epidemiological or vaccine efficiency assessments since that antibodies targeting these two linear epitopes account for a significant fraction of the anti-S-neutralising response.</p>

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Sensors 31MAY2020	Development of a Portable, Ultra-Rapid and Ultra-Sensitive Cell-Based Biosensor for the Direct Detection of the SARS-CoV-2 S1 Spike Protein Antigen	Mavrikou, Sophie et al. Greece gotopaper	Diagnostic	<p>One of the key challenges of the recent COVID-19 pandemic is the ability to accurately estimate the number of infected individuals, particularly asymptomatic and/or early-stage patients.</p> <p>=> Proof-of-concept development of a biosensor able to detect the SARS-CoV-2 S1 spike protein. The biosensor is based on membrane-engineered mammalian cells bearing the human chimeric spike S1 antibody.</p> <p>Results: We demonstrate that the attachment of the protein to the membrane-bound antibodies resulted in a selective and considerable change in the cellular bioelectric properties measured by means of a Bioelectric Recognition Assay. The novel biosensor provided results in an ultra-rapid manner (3 min), with a detection limit of 1 fg/mL and a semi-linear range of response between 10 fg and 1 µg/mL. In addition, the observed high sensitivity of the biosensor could allow for screening the virus in easy-to-obtain patient samples such as saliva. No cross-reactivity was observed against the SARS-CoV-2 nucleocapsid protein. Furthermore, the biosensor was configured as a ready-to-use platform, including a portable read-out device operated via smartphone/tablet</p> <p>Conclusion: The novel biosensor can be potentially applied for the mass screening without prior sample processing. The next step will be the actual clinical validation of the assay using patient samples and comparison to current serological and molecular tests</p>
Int. J. Infect. Dis. 31MAY2020	Fast SARS-CoV-2 detection by RT-qPCR in preheated nasopharyngeal swab samples	Alcoba-Florez, Julia et al. Spain gotopaper	Diagnostic	<p>Performance of three alternative, simple and affordable protocols to rapidly detect SARS-CoV-2, bypassing the long and tedious RNA extraction step and reducing the time to viral detection: three methods based on direct nasopharyngeal swab viral transmission medium (VTM) heating before the RT-qPCR: a) direct without additives; b) in a formamide-EDTA (FAE) buffer, c) in a RNAsnap™ buffer.</p> <p>Although with a delay in cycle threshold compared to the gold-standard, we found consistent results in nasopharyngeal swab samples that were subject to a direct 70°C incubation for 10 min.</p> <p>CI°: This study provides valuable options to overcome any supply chain issue and help to increase the throughput of diagnostic tests, thereby complementing standard diagnosis.</p>
Int. J. Infect. Dis. 31MAY2020	Aberrant hyperactivation of cytotoxic T-cell as a potential determinant of COVID-19 severity	Kang, Chang Kyung et al. Rep. of Korea gotopaper	Immuno	<p>We hypothesized that immune response may contribute to progression of coronavirus disease-19 (COVID-19) at the second week of illness. Therefore, we compared cell-mediated immune (CMI) responses between severe and mild COVID-19 cases.</p> <p>We examined peripheral blood mononuclear cells of laboratory-confirmed COVID-19 patients from their first and third weeks of illness.</p> <p>CI°: Severe COVID-19 had higher degree of proliferation, activation, and cytotoxicity of T-cells at the late phase of illness without cytotoxic T-cell contraction, which might contribute to the development of severe COVID-19.</p> <p>Limitations: Small numbers of patients. Requires more time points to be examined to elucidate the exact temporal changes of such responses or when the persistent cytotoxic T-cell activity returns to normal in severe cases. The potential immunomodulatory effects of lopinavir/ritonavir could not be adjusted because the drug was prescribed to all severe patients in this study.</p>

Journal and date	Title	Authors and link	Field of expertise	Key facts
J. Clin. Virol. 30MAY2020	Persistent detection of SARS-CoV-2 RNA in patients and healthcare workers with COVID-19	Gombar, Saurabh et al. USA gotopaper	Diagnostic	<p>Current guidelines for returning health care workers (HCW) to service after a positive SARS-CoV-2 RT-PCR test and ceasing of transmission precautions for patients is based on two general strategies: A test-based strategy that requires negative respiratory RT-PCR tests obtained after the resolution of symptoms; a symptom-based strategy that recommends excluding HCW from the workforce until a fixed period of time has elapsed from symptom recovery.</p> <p>Objective: to better understand the appropriate length of symptom-based return to work and contact precaution strategies.</p> <p>Observational analysis of 150 patients and HCW shows that the average time to transition from RT-PCR positive to negative was 24 days after symptom onset and 10 % remained positive even 33 days after symptom onset.</p> <p>CL°: the fixed length of time before returning to work or ceasing contract precautions be revised to over one-month. Note: our analysis could be overestimating the length of infectious spreading by detecting non-infectious viral shedding. Large trials that rely on methods that detect the infective virus (ie viral culture) have not yet been reported in the literature.</p>
Brain, Behavior and Immunity 30MAY2020	COVID-19 pandemic and mental health consequences: systematic review of the current evidence	Vindegard and Eriksen Benros, Denmark gotopaper	Psy	<p>COVID-19 patients displayed high levels of PTSS and increased levels of depression.</p> <ul style="list-style-type: none"> •Patients with preexisting psychiatric disorders reported worsening of psychiatric symptoms. •Higher levels of psychiatric symptoms were found among health care workers. •A decrease in psychological well-being was observed in the general public. •However, well conducted large-scale studies are highly needed.
Clin. Infect. Dis. 30MAY2020	Maximum Daily Temperature, Precipitation, Ultra-Violet Light and Rates of Transmission of SARS-CoV-2 in the United States	Shera T et al., USA gotopaper	Public Health/Epidemio	<p>Aim: to investigate effects of temperature, precipitation, and UV Light on community transmission of SARS-CoV-2 in the USA.</p> <ul style="list-style-type: none"> - A maximum temperature >52° F on a given day was associated with a lower rate of new cases at 5 days. - Below 52° F, there was a significant inverse association between the maximum daily temperature and the rate of cases at 5 days. - In a theoretical state with a stable maximum daily temperature >52° F, the rate of new cases is predicted to be of 23-fewer cases per-million per-day by 25 days of the epidemics. - A 1-unit higher UV index was associated with a lower rate at 5 days. - Precipitation was not associated with a greater rate of cases at 5 days. <p>The incidence of disease is lower at warmer versus cooler temperatures, but this association is small, and transmission is likely to remain high at warmer temperatures.</p>
Cell Reports 30MAY2020	Structural and biochemical characterization of nsp12-nsp7-nsp8 core polymerase complex from SARS-CoV-2	Peng, Qi et al. China gotopaper	Structural biology	<p>Cryo-EM structure of SARS-CoV-2 core polymerase complex (nsp12 catalytic subunit + nsp7-nsp8 cofactors):</p> <ul style="list-style-type: none"> - Structure highly resembles SARS-CoV counterpart with conserved motifs for all viral RNA-dependent RNA polymerases, and suggests a mechanism for activation by cofactors. - SARS-CoV-2 core complex has lower enzymatic activity than SARS-CoV. - SARS-CoV-2 nsp7/8/12 subunits are less thermostable than the SARS-CoV counterpart. <p>-> Provides insights into RNA synthesis by coronavirus polymerase and indicate adaptation of SARS-CoV-2 towards humans with relatively lower body temperatures than the natural bat hosts.</p>

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Clin. Infect. Dis. 30MAY2020	Surgical mask partition reduces the risk of non-contact transmission in a golden Syrian hamster model for Coronavirus Disease 2019 (COVID-19)	Chan, Jasper Fuk-Woo <i>et al.</i> China gotopaper	Transmission - Animal model	<p>Golden Syrian hamster SARS-CoV-2 model to experimentally address effect of surgical mask on transmission :</p> <p>Surgical mask partition placed between cages of SARS-CoV-2-challenged index hamsters and naïve hamsters (closed system units separated by a polyvinyl chloride air porous partition + unidirectional airflow).</p> <p>- Surgical mask partition for challenged hamsters significantly reduced transmission to 16.7% (2/12, P=0.019) of exposed naïve hamsters compared to exposed naïve hamsters without surgical mask partition (66.7%).</p> <p>- Unlike severe COVID-19 manifestations of challenged hamsters, infected naïve hamsters had lower clinical scores, milder histopathological changes, and lower viral nucleocapsid antigen expression respiratory tract tissues.</p> <p>-> SARS-CoV-2 could be transmitted by respiratory droplets or airborne droplet nuclei in the hamster model. Such transmission could be reduced by surgical mask usage, especially when masks were worn by infected individuals.</p>
J Med Virol 29MAY2020	Serum KL-6 concentrations as a novel biomarker of severe COVID19	d'Alessandro, Miriana <i>et al.</i> Italy gotopaper	Virology	<p>SARS-CoV-2 induced direct cytopathic effects against type I and II pneumocytes mediate lung damage. Krebs von den Lungen-6 (KL-6) is mainly produced by damaged or regenerating alveolar type II pneumocytes. This preliminary study analysed serum concentrations of KL-6 in COVID19 patients to verify its potential as a prognostic biomarker of severity.</p> <p>CI*: NK cell analysis and assay of KL-6 in serum can help identify severe COVID19 patients. Increased KL-6 serum concentrations were observed in patients with severe pulmonary involvement, revealing a prognostic value and supporting the potential usefulness of KL-6 measurement to evaluate COVID19 patients prognosis.</p> <p>Limitations: these results are worthy of further validation in a larger cohort to define the cut-off value for identifying patients at high risk of severe respiratory failure.</p>
BMJ 29MAY2020	Covid-19: the ethics of clinical research in quarantine	Nicholas G Evans, USA gotopaper	SHS/Sciences Po	<p>Quarantine = an opportunity to gain scientific knowledge of covid-19. Quarantine provides a model community in which to study both the social and epidemiological characteristics of a disease outbreak.</p> <p>As a closed system, quarantine offers the possibility for highly controlled research into the development and transmission of covid-19</p> <p>But this opportunity is also an ethical risk. This knowledge would be obtained with human rights violation (such as liberty). Moreover, individuals under quarantine seem to me more vulnerable to researchers. Confinement could affect their ability to choose or not to participate into research.</p> <p>Finally, research in this context could be a major opportunity to clarify when quarantine is, or is not, effective and proportionate (with high quality data on COVID-19).</p>
Journal of Allergy and Clinical Immunology 29MAY2020	Successful use of methylprednisolone for treating severe COVID-19	Liu, Jing <i>et al.</i> China gotopaper	Therapeutic	<p>Case series of 101 consecutive hospitalized patients with confirmed COVID-19 infection, among which 26 were classified as severe or critical (25.74%), with at least 10 patients had a PaO₂/FIO₂ ratio of less than 150 mmHg, treated with methylprednisolone.</p> <p>-> Timely and appropriate application of glucocorticoid in severe and critical COVID-19 patients may improve outcomes and lung function and could avoid the need for invasive mechanical ventilation, compared with outcomes in reported studies.</p> <p>-> Single-dose pulse methylprednisolone (40-500mg methylprednisolone) had no apparent negative impact on SARS-CoV-2 removal and production of specific IgG.</p>

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Nature Communications 29MAY2020	Detection of air and surface contamination by SARS-CoV-2 in hospital rooms of infected patients	Chia, PY et al., Singapore gotopaper	Public Health/Epidemiology	<p>Screening for SARS-CoV-2 RNA on surface and air samples from 3 airborne infection isolation rooms (AIIRs) in ICU and 27 AIIRs in the hospital general ward hosting Covid-19 patients. From 245 surface samples collected:</p> <ul style="list-style-type: none"> - 56.7% of rooms have at least one surface contaminated - High touch surface contamination is shown in 10 (66.7%) out of 15 patient environments in the first week of illness, and 3 (20%) beyond the first week of illness - Air sampling performed in 3 of 27 general ward AIIRs ward detected SARS-CoV-2 PCR-positive particles of sizes >4 microm and 1-4 microm in two rooms, despite these rooms having 12 air changes per hour. <p>This warrants further study of the particle size distribution and airborne transmission potential of SARS-CoV-2.</p>
Science 29MAY2020	Introductions and early spread of SARS-CoV-2 in the New York City area	Gonzalez-Reiche et al, USA gotopaper	Public Health/Epidemiology	<p>Aim: to identify the early transmission events underlying the rapid spread of the virus in the NYC metropolitan area, by sequencing SARS-CoV-2 from patients. Phylogenetic analysis of 84 distinct SARS-CoV-2 genomes indicated:</p> <ul style="list-style-type: none"> - multiple, independent but isolated introductions mainly from Europe and other parts of the United States, - evidence for community transmission of SARS-CoV-2 as suggested by clusters of related viruses found in patients living in different neighborhoods of the city.
Science Advances 29MAY2020	Emergence of SARS-CoV-2 through recombination and strong purifying selection	Li, Xiaojun <i>et al.</i> USA - China gotopaper	Phylogenetic	<p>Localised genomic analysis of patterns of evolutionary recombination between CoVs from distinct host species that likely originated SARS-CoV-2, reveal:</p> <ul style="list-style-type: none"> - Strong purifying selection around the receptor binding motif (RBM) of the spike among bat, pangolin, and human coronaviruses. - SARS-CoV-2's entire RBM was introduced through recombination with coronaviruses from pangolins, possibly a critical step in the evolution of SARS-CoV-2's ability to infect humans. <p>Note: all 3 human CoVs (SARS, MERS and SARS-2) are the result of recombination among CoVs involving the S gene, likely a precondition to zoonosis that enabled efficient binding to human receptors.</p> <p>-> Similar evolutionary selection in different host species, together with frequent recombination among coronaviruses, suggest a common evolutionary mechanism that could lead to new emerging human coronaviruses.</p>
Lancet 29MAY2020	Mortality and pulmonary complications in patients undergoing surgery with perioperative SARS-CoV-2 infection: an international cohort study	COVIDSurg Collaborative UK gotopaper	Clinic	<p>International – multicentre – 235 hospitals – 24 countries Surgery + SARS-CoV-2 positive within 7 before or 30 days after → 1128 patients Pulmonary complication: ARDS or pneumonia or unexpected postoperative ventilation 74% had emergency surgery and 24,8% elective surgery 30-day mortality= 23,8% Pulmonary complications= 51,2% with 38% of mortality Association with mortality (adjusted analysis):</p> <ul style="list-style-type: none"> - Male sex OR: 1,75 [1,28 – 2,40] - > or = 70 years OR: 2,30 [1,65 – 3,22] - ASAS grade 3-5 OR: 2,35 [1,57 – 3,53] - Malignant diagnosis OR: 1,55 [1,01 – 2,39] - Emergency surgery OR: 1,67 [1,06 – 2,63] - Major surgery OR: 1,52 [1,01 – 2,31] <p>→ pulmonary complication in more than half of patients with perioperative SARS-CoV-2 infection → postponing non urgent procedure and promoting non operative treatment</p>

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The Journal of clinical investigation 28MAY2020	Impaired immune cell cytotoxicity in severe COVID-19 is IL-6 dependent	Mazzoni, Alessio et al, Italy gotopaper	Immuno	<p>Characterization of the immune response in SARS-CoV-2 infected patients hospitalized at the Careggi University Hospital, Florence, Italy</p> <ul style="list-style-type: none"> A flow cytometric characterization of immune cells subsets from 30 COVID-19 patients correlated with clinical outcomes confirms a decreased number of circulating T, B and NK cells and that T CD4+, T CD8+ but also NK cells displayed reduced anti-viral cytokine production capability. The study shows a skewing of CD8+ T cells towards a terminally differentiated/senescent phenotype via a TNF-mediated T cell apoptosis. This may contribute to an uncontrolled inflammatory response. In a group of patients that required intensive care, serum IL-6 levels are inversely correlated with the frequency of granzyme-expressing NK cells. This underlines that the exposure to high levels of IL-6 inhibits NK cell cytotoxicity and down-regulates the expression of perforin and granzyme. In all patients treated with tocilizumab an increased expression of both perforin and granzyme in NK cells was observed as well as a decrease of CRP, which is considered as a marker of IL-6 mediated inflammation. This study points out that tocilizumab might restore the cytotoxic potential of NK cells. <p>Conclusion: This current work endorses that targeting IL-6 cytokine might restore anti-viral mechanisms and the use an anti-IL-6 receptor monoclonal antibody in COVID-19 patients remains a potential therapeutic option.</p>
Natl Sci Rev 28MAY2020	Preliminary evidence from a multicenter prospective observational study of the safety and efficacy of chloroquine for the treatment of COVID-19	Huang, Mingxing et al. China gotopaper	Therapeutic	<p>Multicenter prospective observational study to assess the efficacy and safety of chloroquine with different doses in COVID-19.</p> <p>A total of 197 patients completed chloroquine treatment, and 176 patients treated with non-chloroquine therapy were included as historical controls. Across the two treatment groups, the majority patients were classified as moderate cases (93.4% in chloroquine; 89.2% in nonchloroquine).</p> <p>The primary endpoint is the time to undetectable viral RNA. Secondary outcomes include the proportion of patients with undetectable viral RNA by day 10 and 14, hospitalization time, duration of fever, and adverse events.</p> <ul style="list-style-type: none"> Patients in the chloroquine group experienced significantly faster and higher rate of viral suppression comparing to the nonchloroquine group in both the full analysis and the post hoc stratified analysis. Even when the dose reduced to half, the benefit of chloroquine still remained. Duration of fever is shorter in chloroquine (geometric mean ratio 0.6; 95% CI 0.5 to 0.8). No serious adverse events were observed in the chloroquine group. Patients treated with half dose experienced lower rate of adverse events than with full dose. No beneficial effect of chloroquine in the length of hospital stay and the duration of oxygen support. Unprecedentedly, 3 cases of so called “re-positive” patients observed in the chloroquine group. <p>Limitations: observational study ; dramatic improvement in the primary outcome in chloroquine could be due to the later treatment initiation since symptom onset ; relatively young study population with few patients with severe symptoms that requires ventilation.</p>

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Lancet HIV 28MAY2020	Description of COVID-19 in HIV-infected individuals: a single-centre, prospective cohort	Vizcarra P et al Spain gotopaper	Clinic	<p>Observational & prospective study: 51 HIV-infected COVID-19+ & 1288 HIV-infected without 1 center in Madrid Mean age of COVID-19= 53,3y (SD:9,5) – 84% of men No difference for age and CD4 cell counts 63% with COVID-19 had at least one comorbidity Clinical presentations similar than in general population 12% critically ill and 4% died <u>Covid-19 vs without COVID-19:</u> - 73% vs 32% received tenofovir before COVID-19 diagnosis ($p=0,0036$) - 22% vs 14% had previous protease inhibitor ($p=0,578$)</p> <p>RT-PCR remained positive after a median of 40 days in 6 patients</p> <p>→ HIV-infected patients should receive the same treatment to the general population</p>
Lancet 28MAY2020	Clinical impact of COVID-19 on patients with cancer (CCC19): a cohort study	Kuderer NM et al USA gotopaper	Clinic	<p>Cohort study from the USA, Canada & Spain from the COVID-19 & cancer consortium (CCC19) Patients with active or previous malignancy & SARS-CoV-2 infection: 928 patients included <u>Malignancy:</u> breast cancer (21%) – prostate (16%) – gastrointestinal (12%) – thoracic (10%) ... <u>Status:</u> active cancer (43%) – remission (45%) – anticancer treatment (39%) 13% had died Median age: 66 y IQR [57 – 76] – 50% were male <u>Independent factor associated with increased 30-day mortality</u> - Increased age per 10 years OR: 1,84 [1,53 – 2,21] - Male OR: 1,63 [1,07 – 2,28] - Former smoker vs never OR: 1,60 [1,03 – 2,47] - Two comorbidities vs none OR: 4,50 [1,33 – 15,28] - Active cancer OR: 5,2 [2,77 – 9,77] - Receipt azithro+hydroxy vs neither OR: 2,93 [1,79 – 4,79] → <i>confounding by indication not excluded</i> Obesity, cancer type, ethnicity, type of anticancer therapy, recent surgery → not associated</p> <p>Limits: regional variations in the primary and secondary outcomes</p> <p>→ High mortality among patients with cancer + COVID-19 → longer follow-up is needed</p>
The Lancet ID 28MAY2020	Implication of SARS-CoV-2 evolution in the sensitivity of RT-qPCR diagnostic assays	Sampaio Osorio and Correia-Neves, Portugal gotopaper	Diagnostic	<p>Reports suggest the virus might be evolving → redesign of the oligonucleotide sequences in use in RT-qPCR assays to circumvent potential primer–sample mismatches ? Analysis of all high-coverage SARS-CoV-2 genome sequences (1825 in total) deposited in the Global Initiative on Sharing All Influenza Data (GISAID) database nucleotide diversity (π) WAS CALCULATED in the binding region of each oligonucleotide.</p> <p>-> 79% (26 of 33) of the primer binding sites used in the RT-qPCR assays were mutated in at least one genome</p> <p>-> at least one of the previously designed primers is now likely to be ineffective at detecting up to 14% of the virus variants in circulation</p> <p>-> Oligonucleotide optimisation will be facilitated by global sharing of SARS-CoV-2 genomes and the frequently updated reports on sequence analysis that are available on the GISAID website.</p>

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<p>BMJ 28MAY2020</p>	<p>Kawasaki-like multisystem inflammatory syndrome in children during the covid-19 pandemic in Paris, France: prospective observational study</p>	<p>Toubiana J et al France gotopaper</p>	<p>Clinic</p>	<p>21 children in a hospital in Paris: median age: 7,9y [3,7 – 16,6] – 43% male 9 had a recent history of a viral like symptoms – 10 reported a recent contact Children of African ancestry were overrepresented (57%) <u>Symptoms</u></p> <ul style="list-style-type: none"> - 57% presented with Kawasaki disease shock syndrome - 76% presented with myocarditis - 100% gastrointestinal symptoms during the early stage <p><u>Biology:</u></p> <ul style="list-style-type: none"> - High level of inflammatory markers (PCT, CRP, IL-6) - 81% had lymphopenia - 95% had elevated D-dimer (>500 µg/L) - 90% recent SARS-CoV-2 infection (PCR or IgG antibody) <p><u>Treatment:</u></p> <ul style="list-style-type: none"> - All received intravenous Ig - 48% received also corticosteroid <p><u>Outcomes:</u></p> <ul style="list-style-type: none"> - 81% required intensive care - 24% had moderate coronary artery dilations - No death – all discharged home after 8 days of hospital stay <p>→ high proportion of children with KD shock syndrome – differ from classic KD → temporal association between the covid-19 pandemic & results of test for SARS-CoV-2 in children with Kawasaki-like disease suggest a causal link → further study is needed</p>
<p>BMJ 27MAY2020</p>	<p>Characteristics and outcomes of pregnant women admitted to hospital with confirmed SARS-CoV-2 infection in UK: national population based cohort study</p>	<p>Knight M et al UK gotopaper</p>	<p>Clinic</p>	<p>National cohort of pregnant women hospitalized with SARS-CoV-2 → 427 women Estimated incidence: 4,9 per 1000 maternities [4,5 – 5,4] <u>Comorbidities:</u></p> <ul style="list-style-type: none"> - 69% were obese or overweight - 34% had co-existence comorbidities: asthma, hypertension, diabetes, cardiac disease <p><u>Symptoms</u></p> <ul style="list-style-type: none"> - Have symptom at median of 34 completely weeks' - Most have symptom on the third trimester: fever – cough – breathlessness ... <p><u>Outcomes</u></p> <ul style="list-style-type: none"> - 62% women admitted gave birth or had a pregnancy loss - 15% women were given corticosteroids for fetal lung maturation - 196 women gave birth at term and 66 preterm → 265 infants - 41 needed respiratory support - 5 women died <p><u>Neonatal</u></p> <ul style="list-style-type: none"> - 5 babies died: 3 stillborn & 2 neonatal period - 12 were positive for SARS-CoV-2 which 6 within the 12 hours → no death <p>→ Most women had good outcome → transmission to infant was uncommon</p>

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Gene Reports 2020	COVID-19 target: A specific target for novel coronavirus detection	Kakhki, Reza Kamali et al. Iran gotopaper	Diagnostic	<p>The diagnosis and differentiation of this virus from other types of coronavirus is essential to control of the disease</p> <p>The analysis of genomics data plays a vital role in introducing a stronger target and consequently provides better results in laboratory examinations. The modified comparative genomics approach helps us to find novel specific targets by comparing two or more sequences on the nucleotide collection database.</p> <p>Unlike previous reported genes (RdRP, E and N genes), ORF8 is entirely specific to the novel coronavirus (COVID-19) and has no cross-reactivity with other kinds of coronavirus CI*: ORF8 gene can be used as an additional confirmatory assay.</p> <p>Limitations: this study was conducted bioinformatically, and laboratory examinations are needed to confirm ORF8 gene as a potential target using RT-PCR, Real time PCR, or Line probe assay</p>
Critical care medicine 27MAY2020	Routine Venous Thromboembolism Prophylaxis May Be Inadequate in the Hypercoagulable State of Severe Coronavirus Disease 2019	Maatman, Thomas K. et al.USA gotopaper	Therapeutic/ Clinic	<p>Observational multicenter study, enrolled 240 consecutive patients among whom 109 critically ill COVID-19 patients admitted to the ICU were included in the analysis. All patients received routine subcutaneous chemical venous thromboembolism prophylaxis.</p> <p>Primary outcome: frequency of venous thromboembolism (VTE) and the degree of inflammatory and coagulation marker elevation associated with venous thromboembolism development.</p> <ul style="list-style-type: none"> - VTE was diagnosed in 31 patients (28%) 8 ± 7 days after hospital admission, including two patients diagnosed with venous thromboembolism at presentation to the hospital. - Elevated admission D-dimer and peak D-dimer were associated with VTE development (p < 0.05). - D-dimer greater than 2,600 ng/mL predicted VTE with an area under the receiver operating characteristic curve of 0.760 (95% CI, 0.661-0.858; p < 0.0001), sensitivity of 89.7%, and specificity of 59.5%. - Twelve patients (11%) had thromboelastography performed and 58% of these patients had a hypercoagulable study. The calculated coagulation index was hypercoagulable in 50% of patients with thromboelastography <p>-> SARS-CoV-2 infection results in systemic hypercoagulability resulting in VTE. Although current data on outcomes in patients receiving therapeutic anticoagulation in COVID-19 are lacking, it is apparent that routine chemical VTE prophylaxis may be inadequate in preventing thrombotic complications in severe COVID-19.</p> <p>Limitations: Although a relatively large series, it is an observational study ; retrospective study ; lack of comparator group of ICU patients without COVID-19 in which to compare VTE frequency ; degree of viremia not evaluated as a risk factor for VTE.</p>
NEJM 27MAY2020	Remdesivir for 5 or 10 Days in Patients with Severe Covid-19	Jason D. Goldman et al. gotopaper	Therapeutic	<p>Open-label, randomized, multicenter trial evaluating the efficacy and safety of treatment with remdesivir for 5 or 10 days in 397 patients with severe Covid-19 disease. The primary end point was clinical status on day 14, assessed on a 7-point ordinal scale.</p> <p>=> No significant difference in efficacy between 5-day and 10-day courses of remdesivir.</p> <p>After adjustment for baseline imbalances in disease severity, outcomes were similar as measured by a number of end points: clinical status at day 14, time to clinical improvement, recovery, and death from any cause. Similar percentages of patients experiencing adverse events.</p> <p>-> Results cannot be extrapolated to critically ill patients receiving mechanical ventilation; further evaluation of this subgroup and of other high-risk groups is needed to determine the shortest effective duration of therapy.</p> <p>Limits: lack of a randomized placebo control group (magnitude of benefit not determined); open-label design.</p>

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SCIENCE 27MAY2020	Reducing transmission of SARS-CoV-2	Prather et al., USA-China gotopaper	Public Health/Epidemiology	<p>PERSPECTIVE</p> <ul style="list-style-type: none"> - Traditional respiratory disease control measures: designed to reduce transmission by droplets produced in the sneezes and coughs of infected individuals. However, a large proportion of the spread: through airborne transmission of aerosols produced by asymptomatic individuals during breathing and speaking. Aerosols can accumulate, remain infectious in indoor air for hours, and be easily inhaled deep into the lungs. Contact (direct or indirect) is also a major source of contamination. - Respiratory droplet size has been shown to affect the severity of disease - “Silent shedders” (asymptomatic / pre-symptomatic) could be critical drivers. In China, undiagnosed cases, presumably asymptomatic, may be responsible for up to 79% of infections. - Many countries have not yet acknowledged airborne transmission as a possible pathway <p>Recommendations for social distancing of 6 ft are based on studies of respiratory droplets carried out in the 1930s, but on large droplets (no technology for submicron aerosols). ->Intense coughs and sneezes that propel larger droplets more than 20 ft can also create thousands of aerosols that can travel even further (<u>like a cigarette smoke</u>)-> 6 ft WHO recommendation is likely not enough.</p> <p>-Viruses can attach to other particles such as dust and pollution, which can modify the aerodynamic characteristics and increase dispersion</p> <p>Aerosol transmission of viruses must be acknowledged as a key factor leading to the spread of infectious respiratory diseases. Evidence suggests that SARS-CoV-2 is silently spreading in aerosols exhaled by highly contagious infected individuals with no symptoms.</p> <p>-> It is essential that control measures be introduced to reduce aerosol transmission (face masks +++)</p>
Nature reviews Immunology 26MAY2020	Dysregulation of type I interferon responses in COVID-19	Dhiraj Acharya et al, USA gotopaper	Immuno	<p>How imbalanced interferon responses may contribute to the pathology of COVID-19:</p> <ul style="list-style-type: none"> • The lung injury in patients with severe COVID-19 underlines a possible failure to activate immunosuppressive mechanisms in a timely manner. One suggestion is that the deficient or dysregulated IFN responses elicited by SARS-CoV-2 infection may influence the generation of regulatory T cells during the recovery phase of COVID-19. • The use of IFNs as a treatment for COVID-19 remains controversial, particularly regarding the timing of administration in mice model and in human • Since ACE2 has been identified as an ISG in human airway epithelial cells¹⁰. This finding raises the question of whether prophylactic or therapeutic IFN administration enhance the entry and replication of SARS-CoV-2 in target cells during disease progression <p>Conclusion: a deeper understanding of the spatiotemporal kinetics of IFN responses during clinical SARS-CoV-2 infections is warranted to inform IFN-related therapeutics and vaccine design.</p>

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Cell Death Discovery 26MAY2020	SARS-CoV-2 infection serology: a useful tool to overcome lockdown?	Nuccetelli, M. et al, Italy gotopaper	Diagnostic	<p>Aim: to compare and to evaluate different serological assays analytical performances (two different immunochromatographic cards, an immunofluorescence chromatographic card, and a chemiluminescence-automated immunoassay) on 43 positive samples with RT-qPCR-confirmed SARS-CoV-2 infection and 40 negative control subjects.</p> <p>→ excellent IgG/IgM specificities for all the immunochromatographic card tests (100% IgG and 100% IgM) and for the chemiluminescence-automated assay (100% IgG and 94% IgM);</p> <p>→ IgG/IgM sensitivities are moderately lower for all methods (94% and 84% for IgG and IgM, respectively), probably due to the assay viral antigen's nature and/or to the detection time of nasopharyngeal swab RT-qPCR, with respect to symptoms onset.</p>
Clinical Infectious Diseases 25MAY2020	Characterization of an asymptomatic cohort of SARS-COV-2 infected individuals outside of Wuhan, China	Wang Y et al China gotopaper	Clinic	<p>Epidemiologic and clinical characteristics of asymptomatic SARS-COV-2 infections</p> <p>279 hospitalized SARS-CoV-2+ contacts of COVID-19 patients → 63 asymptomatic included</p> <p>Mean time to diagnosis after contact: 16 days Mean age: 39,3 - 87,3% had no comorbidities <u>Laboratory findings:</u> quasi normal for all</p> <p>2 groups: abnormal chest CT findings (29) & normal chest CT findings (34)</p> <ul style="list-style-type: none"> - Patient with abnormal findings were older ($p < 0,05$) - Time from exposure to illness shorter in patient with abnormal CT ($p > 0,05$) <p><u>Outcomes:</u></p> <ul style="list-style-type: none"> - 9 transmitted the virus to others with and without abnormal chest CT - No one died <p>→ asymptomatic infections play a large role in transmission → impact on treatment of symptomatic cases on transmission?</p>
The Lancet 25MAY2020	Assistance Publique–Hôpitaux de Paris' response to the COVID-19 pandemic	The COVID19-APHP Group, France gotopaper	Public Health/Epidemiology	<p>Key points of an effective AP-HP response to the Covid-19 crisis:</p> <ul style="list-style-type: none"> - Establishment of a medical organisation led by a central crisis medical director and supported by medical directors in each hospital - Allocation of human resources to recruit and train specialised staff from a single platform - Centralised logistics to adjust to shortages the equipment and consumables daily supply - Recruitment of students of various medical branches to support as paramedics, research assistants, operators of a telemedicine platform. - Regional centralised ICU bed-allocation system - Regularly updated practical guidelines for all hospitals - Development of a common research strategy prioritising patient cohorts, biobanking, clinical trial - Large scale initiatives: equipment 3D printing, Covidom telemedicine platform - Setup of a region-wide patient-tracing programme

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Nature Climate Change 23MAY2020	Temporary reduction in daily global CO2 emissions during the COVID-19 forced confinement	Le Quéré et al. UK, gotopaper	SHS/SciPo	<p>> Emissions of carbon dioxide rise by about 1% per year over the previous decade</p> <p>> COVID 19 imposed confinement leads to drastic changes in energy use, with expected impacts on CO2 emissions. However CO2 emissions are reported as annual values and there is no available real time data</p> <p>> An alternative approach using a combination of energy, activity and policy data was used to estimate changes in CO2 daily emissions during the confinement is proposed (69 countries, 50 US states and 30 Chinese provinces; 85% of global population; 87% of global emissions)</p> <p>Results</p> <p>> Estimated decrease in daily fossil CO2 emissions from the severe and forced confinement of world populations: -17% (-11 to -25%)</p> <p>> Annual associated decrease: -4.2 to -7.5% (rates needed over the next decades to limit climate change to 1.5 °C warming)</p> <p>> However observed changes are likely to be temporary as they do not reflect structural changes in the economic, transport or energy systems.</p>
Biosensors and Bioelectronics 23MAY2020	Ultra-sensitive and high-throughput CRISPR-Powered COVID-19 diagnosis	Huang, Zhen and al. USA gotopaper	Diagnostic	<p>A rapid, sensitive SARS-CoV-2 diagnostic assay capable of high-throughput operation that can preferably utilize existing equipment to facilitate broad, large-scale screening efforts.</p> <p>The developed assay utilizes a custom CRISPR Cas12a/gRNA complex and a fluorescent probe to amplify target amplicons produced by standard RT-PCR or isothermal recombinase polymerase amplification (RPA), to allow sensitive detection at sites not equipped with real-time PCR systems required for qPCR diagnostics.</p> <p>The results obtained on nasal swab samples of individuals with suspected COVID-19 cases were comparable to paired results from a CDC-approved qPCR assay performed in a state testing lab, and superior to those produced by same assay in a clinical lab, where the qPCR assay exhibited multiple invalid or inconclusive results. It also demonstrated greater analytical sensitivity and more robust diagnostic performance than other recently reported CRISPR-based assays.</p> <p>CI*: a CRISPR-based fluorescent application has potential to improve current COVID-19 screening efforts.</p>
BMJ 22MAY2020	Features of 20 133 UK patients in hospital with covid-19 using the ISARIC WHO Clinical Characterisation Protocol: prospective observational cohort study	Docherty, AB. Et al. UK gotopaper	Clinic	<p>Aim: To characterise the clinical features of 20 133 hospital patients with Covid-19 enrolled in the ISARIC WHO CCP-UK prospective cohort study, and to explore risk factors associated with admission to critical care and mortality in hospital. Patient follow-up time was of two weeks minimum.</p> <p>→ Median age: 73 years (interquartile range (IR) 58-82, range 0-104). 60% of patients were men, 40% women. Median duration of symptoms before admission was 4 days (IR 1-8).</p> <p>→ Comorbidities: chronic cardiac disease (31%), uncomplicated diabetes (21%), non-asthmatic chronic pulmonary disease (18%), chronic kidney disease (16%); 23% had no reported major comorbidity.</p> <p>→ 41% of patients were discharged alive, 26% died, 34% continued receiving care as of reporting date. 17% (3001/18 183) required admission to high dependency or ICU; of these, 28% were discharged alive, 32% died, and 41% continued to receive care. Of those receiving mechanical ventilation (1658), 17% were discharged alive, 37% died, and 46% remained in hospital. Increasing age, male sex, and chronic comorbidities were associated with higher mortality in hospital.</p>

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Circulation 22MAY2020	Cardiovascular Toxicities Associated with Hydroxychloroquine and Azithromycin: An Analysis of the World Health Organization Pharmacovigilance Database	Nguyen, Lee S. et al. France/USA gotopaper	Therapeutic	<p>Observational, retrospective study, that used VigiBase®, the WHO pharmacovigilance database encompassing over 21 million reports from over 130 countries, to compare CV-ADR reporting in patients who received hydroxychloroquine, azithromycin, or their combination with cardiovascular adverse-drug-reactions (CV-ADRs) reported with all other drugs in the full database.</p> <p>Extraction of 76,822 ADR cases associated with hydroxychloroquine alone, 89,692 with azithromycin alone, and 607 with the combination of both drugs. The cases were retrieved from 21,275,867 total ADR reports in VigiBase®. The lower end of the IC's 95% credibility interval is IC025. It is considered significant when above 0.</p> <ul style="list-style-type: none"> - Significant greater reporting of prolonged-QT (LQT) and/or ventricular tachycardia including Torsades-de-Pointes (TdP/VT) for each drug individually in suspected cases (IC025=1.67 for azithromycin and IC025=1.04 for hydroxychloroquine). - Hydroxychloroquine was also associated with conduction disorders (atrioventricular and bundle branch blocks) (IC025=1.04) and heart failure (HF, IC025=0.06). - Azithromycin monotherapy was associated with a greater reporting of LQT and/or TdP/VT than hydroxychloroquine monotherapy. The combination of azithromycin and hydroxychloroquine was associated with a greater reporting of LQT and/or TdP/VT than either drug in monotherapy. - The proportion that resulted in death for TdP/VT cases was 8.4% with hydroxychloroquine and 20.2% with azithromycin versus 0% and 5.4% for LQT without TdP/VT with hydroxychloroquine and azithromycin, respectively (p<0.001 for both). - Corresponding death rate was 20.7% for HF associated with hydroxychloroquine. Dose of hydroxychloroquine was higher in HF compared to LQT and/or TdP/VT cases. <p>Main limitation: without data on numbers exposed in VigiBase, this work cannot assess the incidence or risk for QT prolongation with these drugs.</p>
Annals of Translational Medicine MAY2020	Preliminary study to identify severe from moderate cases of COVID-19 using combined hematology parameters	Wang, Changzheng et al. China gotopaper	Diagnostic	<p>The aim of this study was to investigate the characteristics and rules of hematology changes in patients with COVID-19, and to explore the possibility differentiating moderate and severe patients using conventional hematology parameters or combined parameters</p> <p>As the disease progressed, white blood cell count (WBC), neutrophil count, neutrophil-to-lymphocyte ratio (NLR), platelet-to-lymphocyte ratio (PLR), red blood cell distribution width-coefficient of variation (RDW-CV), and red cell volume distribution width-standard deviation (RDW-SD) parameters in the severe group were significantly higher than those in the moderate group.</p> <p>CI°: the combined NLR and RDW-SD parameter is the best hematology index. It may help clinicians to predict the severity of COVID-19 patients and can be used as a useful indicator to help prevent and control the epidemic</p>

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Gastroenterology 22MAY2020	Famotidine Use is Associated with Improved Clinical Outcomes in Hospitalized COVID-19 Patients: A Propensity Score Matched Retrospective Cohort Study	Freedberg, Daniel E. et al. USA gotopaper	Therapeutic	<p>Retrospective cohort study of 1,620 hospitalized patients tested positive for SARS-CoV-2 within 72 hours following admission including 84 patients who received famotidine within 24 hours of hospital admission.</p> <p>Primary outcome was a composite of death or endotracheal intubation.</p> <p>Although Famotidine has not previously been studied in patients for antiviral effects, an untargeted computer modelling analysis identified famotidine as one of the highest-ranked matches for drugs predicted to bind 3CLpro, a SARS-CoV-2 protease which generates non-structure proteins critical to viral replication.</p> <p>340 (21%) patients met the composite study outcome. Famotidine use was significantly associated with a reduced risk of clinical deterioration leading to intubation or death. A randomized controlled trial is currently underway to determine whether famotidine can improve clinical outcomes in hospitalized COVID-19 patients.</p> <p>Limitations: observational; no samples were gathered, and mechanism cannot be directly assessed; single center study.</p>
Clinical infectious diseases 22MAY2020	Association of renin-angiotensin-aldosterone system inhibitors with COVID-19-related outcomes in Korea: a nationwide population-based cohort study	Jung, Sun-Young et al. Korea gotopaper	Therapeutic/ Clinic	<p>Nationwide population-based cohort study in Korea comparing the clinical outcomes of confirmed COVID-19 cases between RAAS inhibitor users and nonusers.</p> <p>The study revealed a significantly higher mortality rate among patients with COVID-19 who were using RAAS inhibitors, relative to patients who were not receiving RAAS inhibitors. However, RAAS inhibitor users were older, had more comorbidities, and were more likely to receive in-hospital treatments. The elevated risk of mortality among RAAS inhibitor users disappeared after adjusting for these confounding factors.</p> <p>This study in an Asian population is clinically relevant, given that the East Asian populations have higher ACE2 expression in tissues than other populations under the similar conditions.</p> <p>Limitations: accuracy of diagnostic codes may be limited; retrospective observational design.</p>
Clinical infectious diseases 22MAY2020	Thymosin alpha 1 (Talpha1) reduces the mortality of severe COVID-19 by restoration of lymphocytopenia and reversion of exhausted T cells	Liu, Yueping et al. China gotopaper	Therapeutic	<p>Retrospective cohort study to evaluate the clinical outcomes of severe or critical COVID 19 hospitalized patients receiving Thymosin alpha 1 (Tα1) supplement. A total of 76 patients were enrolled (36 in the treatment group and 40 in the non treatment group)</p> <p>Compared with untreated group, Tα1 treatment significantly reduces mortality of severe COVID-19 patients (11% vs. 30%, p=0.044). Tα1 timely enhances blood T cell numbers in COVID-19 patients with severe lymphocytopenia. Under such conditions, Tα1 also successfully restores CD8+ and CD4+ T cell numbers in aged patients. Meanwhile, Tα1 reduces PD-1 and Tim-3 expression on CD8+ T cells from severe COVID-19 patients in comparison with untreated cases.</p> <p>Limitations: issue with the normalization of TREC levels among individuals; retrospective study and small sample size; mortality as primary clinical outcome and not clinical improvement.</p>

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NEJM 22MAY2020	Remdesivir for the Treatment of Covid-19 — Preliminary Report	Beigel, John H. et al., USA gotopaper	Therapeutic	<p>Double-blind, randomized, placebo-controlled trial of intravenous remdesivir in 1063 adults hospitalized with Covid-19 with evidence of lower respiratory tract involvement in 60 trial sites in 10 countries.</p> <p>The primary outcome was the time to recovery, defined by either discharge from the hospital or hospitalization for infection-control purposes only.</p> <p>Early unblinding of the results recommended by the DSMB based on findings from an analysis that showed shortened time to recovery in the remdesivir group.</p> <p>Preliminary results from the 1059 patients (538 assigned to remdesivir and 521 to placebo) suggest that a 10-day course of remdesivir was superior to placebo in the treatment of hospitalized patients with Covid-19.</p> <ul style="list-style-type: none"> - This benefit was seen in the number of days to recovery (median, 11 days, as compared with 15; rate ratio for recovery, 1.32 [95% CI, 1.12 to 1.55]) and in recovery according to the ordinal scale score at day 15 (odds ratio, 1.50; 95% CI, 1.18 to 1.91). - Mortality was numerically lower in the remdesivir group than in the placebo group, but the difference was not significant (hazard ratio for death, 0.70; 95% CI, 0.47 to 1.04; 1059 patients). - Incidence of adverse events was not found to be significantly different between the remdesivir group and the placebo group. <p>Awaiting final visits, data entry, monitoring, and data lock for the last of the 1063 patients enrolled, to provide an update of the results.</p>
The Lancet 22MAY2020	Hydroxychloroquine or chloroquine with or without a macrolide for treatment of COVID-19: a multinational registry analysis	Mandeep R Mehra et al., USA gotopaper	Therapeutic	RETRACTED
mBio 22MAY2020	Antiviral Efficacies of FDA-Approved Drugs against SARS-CoV-2 Infection in Ferrets	Park, Su-Jin et al. Korea gotopaper	Therapeutic	<p>FDA-approved drugs lopinavir-ritonavir, hydroxychloroquine sulfate, and emtricitabine-tenofovir were tested against SARS-CoV-2 infection in a highly susceptible ferret infection model.</p> <p>While most of the drug treatments marginally reduced clinical symptoms, they did not reduce virus titers, with the exception of emtricitabine-tenofovir treatment, which led to diminished virus titers in nasal washes at 8 dpi.</p> <p>Further, the azathioprine-treated immunosuppressed ferrets showed delayed virus clearance and low SN titers, resulting in a prolonged infection.</p>

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BMJ 22MAY2020	Factors associated with hospital admission and critical illness among 5279 people with coronavirus disease 2019 in New York City: prospective cohort study	Petrilli CM, et al., USA gotopaper	Clinic	<p>Aim: To describe outcomes, and clinical and laboratory characteristic associated with severity of illness of 5279 patients admitted with Covid-19 in NYC/Long Island (US).</p> <p>→ 48.2% of people tested (5566/11544) were positive for SARS-CoV2; of the 5279 patients included, 51.9% were admitted to hospital. Of these, 69.5% were discharged without hospice care, 24.3% were discharged to hospice care or died. Of 647 (23.6% of hospitalised) patients requiring mechanical ventilation, 60.4% died and 26.2% were extubated or discharged.</p> <p>→ Risk for hospital admission was associated with age (odd ratio >2 for age groups >44 years, 37.9 (95% CI[26.1 to 56.0]) for >75 years), heart failure (4.4, 2.6 to 8.0), male sex (2.8, 2.4 to 3.2), chronic kidney disease (2.6, 1.9 to 3.6), increase in body mass index (BMI) (eg, for BMI >40: 2.5, 1.8 to 3.4).</p> <p>→ Risk for critical illness besides age was associated with heart failure (1.9, 1.4 to 2.5), BMI >40 (1.5, 1.0 to 2.2), and male sex (1.5, 1.3 to 1.8). Admission oxygen saturation of <88% (3.7, 2.8 to 4.8), troponin level >1 (4.8, 2.1 to 10.9), C reactive protein level >200 (5.1, 2.8 to 9.2), and D-dimer level >2500 (3.9, 2.6 to 6.0) were more strongly associated with critical illness than age or comorbidities.</p> <p>→ Risk of critical illness decreased significantly over the study period, and similar associations were found for mortality alone, potentially suggesting improvement in care.</p>
Science 22MAY2020	Safety, tolerability, and immunogenicity of a recombinant adenovirus type-5 vectored COVID-19 vaccine: a dose-escalation, open-label, non-randomised, first-in-human trial	Zhu FC et al. China, gotopaper	Vaccine	<p>Phase 1 vaccine trial using the recombinant non-replicating adenovirus 5 type vectored COVID 19 vaccine expressing the S protein (open label; non randomised; dose escalation-5x10¹⁰/1x10¹¹/5x10¹¹ viral particles). NCT04313127 108 patients recruited (18-60 years; 51% male-49% female)</p> <p>Endpoint for safety: 7D post vaccination/recording of AE until 28D post-vaccination</p> <p>Humoral immunogenicity endpoints: The specific ELISA antibody titres to RBD and S protein, and the neutralising antibody amounts against live SARS-CoV-2</p> <p>Positive antibody response (seroconversion): at least a four-fold increase in post-vaccination titre from baseline</p> <p>SAE and Safety > 83%/83%/75% (related to increasing dose, non-significant difference) of patients had at least an AE of moderate/mild severity within the first 7 days (pain, fever, fatigue, headache or muscle pain) > no serious AE were recorded at 28d post vaccination</p> <p>Protection Elisa antibodies and neutralizing antibodies increased at D14 and peaked at D28 post-vaccination. Specific T cells response peaked at D14 post-vaccination</p> <p>Comments > Older age participants could have a negative effect on the vaccine-elicited responses to SARS-CoV-2 > ADE not evaluated (because of low number of participants) > Pre-existing Ad5 immunity might also have a negative effect on the persistence of the vaccine-elicited immune responses. Issues to evaluate in Phase 2</p>

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Neurology 22MAY2020	Clinical characteristics and outcomes of inpatients with neurologic disease and COVID-19 in Brescia, Lombardy, Italy	Benussi A et al Italy gotopaper	Clinic	<p>Outcomes of patients admitted with neurological disorders with and without COVID-19 173 patients included: 56 COVID-19 pos & 117 COVID-19 neg No difference for comorbidities Patients with COVID-19: -Older: 77,0 versus 70,1 years ($p=0,006$) -More cerebrovascular disorders: 76,8% versus 58,1% ($p=0,035$) -Higher qSOFA: 0,9 versus 0,5 ($p=0,006$) -Higher incidence of delirium: 26,8% versus 7,7% ($p=0,003$) -Higher in-hospital mortality: 75,5% versus 4,3% ($p<0,001$) -Wider use of high flow oxygenation: 76,8% versus 9,4% ($p<0,001$) -Prolonged length of stay Potential risk factor of poor prognosis: high qSOFA score – thrombocytopenia – increase lactate deshydrogenase level RT-PCR detects RNA, not infectious virus, thus its ability to determine duration of infectivity of patients is limited.</p>
Clinical infectious diseases 22MAY2020	Predicting infectious SARS-CoV-2 from diagnostic samples	Bullard, Jared and al. Canada gotopaper	Diagnostic	<p>Objective: to determine the relationship between E gene SARS-CoV-2 RT-PCR cycle threshold (Ct) values from respiratory samples, symptom onset to test (STT) and infectivity in cell culture. => SARS-CoV-2 Vero cell infectivity was only observed for RT-PCR Ct < 24 and STT < 8 days. Infectivity of patients with Ct >24 and duration of symptoms >8 days may be low. CI^o: this information can inform public health policy and guide clinical, infection control and occupational health decisions. However, further studies of larger size are needed.</p>
Analytical chemistry 22MAY2020	A novel one-step single-tube nested quantitative Real-Time PCR assay for highly sensitive detection of SARS-CoV-2	Wang, Ji and al. China gotopaper	Diagnostic	<p>qRT-PCR results could be false-negative due to the inadequate sensitivity of qRT-PCR. In this study, we have developed and evaluated a novel one-step single-tube nested quantitative Real-Time PCR (OSN-qRT-PCR) assay for highly sensitive detection of SARS-CoV-2 targeting the ORF1ab and N genes. The sensitivity of the OSN-qRT-PCR assay was 1 copy/reaction and 10-fold higher than that of commercial qRT-PCR kit (10 copies/reaction). CI^o : Compared to the qRT-PCR kit, OSN-qRT-PCR assay revealed higher sensitivity and specificity hence better suited to clinical applications for the detection of SARS-CoV-2 in patients with low viral load.</p>
New England Journal of Medicine 21MAY2020	Pulmonary Vascular Endothelialitis, Thrombosis, and Angiogenesis in Covid-19	Ackermann, Maximilian, et al. Germany-Belgium-UK-USA gotopaper	Clinic	<p>Lungs (autopsy) from patients: 7 who died from Covid-19 vs 7 who died from acute respiratory distress syndrome secondary to influenza A (H1N1) infection vs 10 age-matched, uninfected control lungs. Common to both Covid-19 and influenza-associated respiratory failure : - diffuse alveolar damage with perivascular T-cell infiltration In Covid-19 patients : - severe endothelial injury (associated to intracellular virus and disrupted cell membranes) - widespread thrombosis with microangiopathy - capillary microthrombi 9x more prevalent compared to influenza patients - new vessel growth 2.7x higher than in lungs from influenza patients -> Vascular angiogenesis distinguished pulmonary pathobiology of Covid-19 from that of equally severe influenza virus infection</p>

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JAMA 21MAY2020	Postmortem Examination of Patients With COVID-19	Schaller, Tina, <i>et al.</i> Germany gotopaper	Clinic	<p>Serial postmortem examinations, 10 patients with proven SARS-CoV-2 infection who died at University Medical Center Augsburg. Median age: 79; range: 64-90 yrs, 7 male; all SARS-CoV-2 +ve by nasopharyngeal swab at hospital admission. Admission median till death: 7.5 days (range, 1-26 days), median of 4 known preexisting comorbidities.</p> <ul style="list-style-type: none"> - At autopsy, SARS-CoV-2 detectable in respiratory tracts of all patients, and PCR +ve in pleural effusion but not in all CSF samples. - Predominant histopathologic findings: acute and organizing diffuse alveolar damage and SARS-CoV-2 persistence in the respiratory tract, constituting the leading cause of death in patients with and without invasive ventilation. - Periportal liver lymphocyte infiltration considered unspecific inflammation. - Whether myoepicardial alterations represented systemic inflammation or early myocarditis is unclear (criteria for true myocarditis not met). - Central nervous system involvement by COVID-19 could not be detected <p>Limitations: small number of cases from a single center and missing proof of direct viral organ infection</p>
Nature 21MAY2020	Structure of replicating SARS-CoV-2 polymerase	Hillen, Hauke <i>S. et al.</i> Germany gotopaper	Structural biology	<p>Cryo-EM structure of SARS-CoV-2 RdRp in active form, mimicking the replicating enzyme:</p> <ul style="list-style-type: none"> - Active site cleft of nsp12 binds first turn of RNA and mediates RdRp activity with conserved residues. - Two copies of nsp8 bind to opposite sides of the cleft and position the second turn of RNA. - Long helical extensions in nsp8 protrude along exiting RNA, forming +vely charged 'sliding poles'. -> sliding poles can account for known processivity of RdRp required for replicating the long coronavirus genome. <p>- Previous study suggested remdesivir functions as 'immediate' RNA chain terminator, while this study showed that several more nucleotides can be added to RNA following remdesivir incorporation, leading to 'delayed' termination -> mechanism that could explain how remdesivir escapes removal from the RNA 3'-end by the viral exonuclease nsp14.</p>
Cell 21MAY2020	Pathogenesis of SARS-CoV-2 in transgenic mice expressing human angiotensin-converting enzyme 2	Jiang, Ren-Di. <i>et al.</i> China-USA gotopaper	Animal model	<p>Developed a SARS-CoV-2 hACE2 transgenic mouse (HFH4-hACE2 in C3B6 mice) infection model, generating:</p> <ul style="list-style-type: none"> - Typical interstitial pneumonia and pathology, similar COVID-19 patients. - Viral quantification: lungs are the major site of infection (viral RNA also found in eye, heart, and brain in some mice). - Full-genome sequences of virus identical to SARS-CoV-2 isolated from the infected lung and brain tissues. - Pre-exposure to SARS-CoV-2 could protect mice from severe pneumonia. <p>-> The hACE2 mouse would be a valuable tool for testing potential vaccines and therapeutics.</p>

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Nature 20MAY2020	Viral and host factors related to the clinical outcome of COVID-19	Zhang, Xiaonan, <i>et al.</i> China gotopaper	Clinic	<p>326 confirmed COVID-19 cases in Shanghai. (SARS-CoV-2 genomic sequences assembled from 112 samples + sequences in the Global Initiative on Sharing All Influenza Data (GISAID)).</p> <p>Observations:</p> <ul style="list-style-type: none"> - stable evolution and 2 major lineages suggested with differential exposure history during the early phase of outbreak in Wuhan (similar virulence and clinical outcomes for both lineages). - Lymphocytopenia predictive of disease progression (especially reduced CD4+ and CD8+ T cell counts upon admission). - High IL-6 and IL-8 levels during treatment in patients with severe/critical disease, which correlated with decreased lymphocyte count. <p>-> Determinants of disease severity seemed to stem mostly from host factors (age, lymphocytopenia and associated cytokine storm), whereas viral genetic variation did not significantly affect outcomes.</p>
Eur. Respir. J. MAY2020	A Fully Automatic Deep Learning System for COVID-19 Diagnostic and Prognostic Analysis	Wang et al., China gotopaper	Diagnostic	<p>Retrospective collection of 5372 patients with computed tomography images from 7 cities or provinces.</p> <p><u>Steps:</u></p> <p>1st-> 4106 patients with computed tomography images were used to pre-train the DL system, making it learn lung features</p> <p>2nd-> 1266 patients from 6 cities or provinces were enrolled to train and externally validate the performance of the deep learning system</p> <p>-> Deep learning system achieved good performance in identifying COVID-19 from other pneumonia (AUC=0.87 and 0.88) and viral pneumonia (AUC=0.86).</p> <p>-> Succeeded to stratify patients into high-risk and low-risk groups whose hospital-stay time have significant difference (p=0.013 and 0.014)</p> <p>-> Without human-assistance, the deep learning system automatically focused on abnormal areas that showed consistent characteristics with reported radiological findings</p>
Science 20MAY2020	SARS-CoV-2 infection protects against rechallenge in rhesus macaques	Chandrashekar A et al. USA gotopaper	Vaccine	<p>Infection of macaques with SARS-CoV-2 results in protective immunity against re-exposure?</p> <p>Methods: Infection of 9 rhesus macaques (6-12 years) with SARS-CoV-2 showing high viral loads in the upper and lower respiratory tract, humoral and cellular immune responses and pathologic evidence of viral pneumonia, re-challenged after virus clearance (D35 post initial infection), + 3 naïve animals as positive controls in the rechallenge experiment</p> <p>Results</p> <ul style="list-style-type: none"> > After primary infection all 9 macaques developed binding antibody responses to S protein and NAb responses and cellular immune responses. > 5 log₁₀ reductions in median viral loads in bronchoalveolar lavage and nasal mucosa compared with primary infection and infected naïve animals > All animals developed anamnestic antibody responses following re-challenge → protection mediated by immunologic control
Cell 20MAY2020	Targets of T Cell Responses to SARS-CoV-2 Coronavirus in Humans with COVID-19 Disease and Unexposed Individuals	Grifoni et al., USA gotopaper	Immuno	<p>Measuring immunity to SARS-CoV-2 is key for understanding COVID-19 and vaccine development</p> <ul style="list-style-type: none"> • Epitope pools detect CD4+ and CD8+ T cells in 100% and 70% of convalescent COVID patients • T cell responses are focused not only on spike but also on M, N, and other ORFs • T cell reactivity to SARS-CoV-2 epitopes is also detected in non-exposed individuals

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The Lancet Infectious Diseases 20MAY2020	Individual quarantine versus active monitoring of contacts for the mitigation of COVID-19: a modelling study	Peak, C. et al, USA gotopaper	Public Health/Epidemiology	<p>Aim: to estimate the comparative efficacy of individual quarantine and active monitoring of contacts to control SARS-CoV-2, fitting a model to the incubation period distribution (mean 5.2 days) and to two estimates of the serial interval distribution (4.8 and 7.5 days).</p> <p>Two feasibility settings: - high-feasibility (90% of contacts traced, half-day average delay in tracing and symptom recognition, 90% effective isolation) - low-feasibility (50% of contacts traced, 2-day average delay, 50% effective isolation).</p> <p>→ Mean time of infectiousness onset before symptom onset : 0.77 days (shorter serial interval) and 0.51 days (longer serial interval).</p> <p>→ Individual quarantine in high-feasibility settings (>75% of infected contacts individually quarantined), contains an outbreak of SARS-CoV-2 with a short serial interval 84% of the time. In low-feasibility setting: the outbreak continues to grow and so does the burden of the number of contacts traced for active monitoring or quarantine, particularly asymptomatic contacts.</p> <p>Conclusion: When resources are prioritised for scalable interventions such as physical distancing, active monitoring or individual quarantine of high-risk contacts, this can contribute synergistically to mitigation efforts.</p>
Science 20MAY2020	DNA vaccine protection against SARS-CoV-2 in rhesus macaques	Yu et al., USA gotopaper	Vaccine	<p>Development of a series of DNA vaccine candidates expressing different forms of the SARS-CoV-2 Spike (S) protein and evaluated them in 35 rhesus macaques.</p> <p>-> humoral and cellular immune response with neutralizing antibody (titers = those found in convalescent humans and macaques).</p> <p>-> challenged with SARS-CoV-2: the vaccine encoding the full-length S protein resulted in >3.1 and >3.7 log₁₀ reductions in median viral loads in bronchoalveolar lavage and nasal mucosa.</p> <p>-> Vaccine-elicited neutralizing antibody titers correlated with protective efficacy: suggests an immune correlate of protection</p>
JAMA 20MAY2020	Nasal Gene Expression of Angiotensin-Converting Enzyme 2 in Children and Adults	Bunyavanich, Supinda, <i>et al.</i> USA gotopaper	Clinic	<p>Nasal epithelium from 305 individuals aged 4-60, with or without asthma (Mount Sinai Health System, New York, during 2015-2018) collected using a cytology brush.</p> <p>ACE2 gene expression in nasal epithelium: - lowest in aged <10 yrs, and significantly higher in older children (10-17 yrs), young adults (18-24 yrs), and adults (≥25 yrs). - ACE2 gene expression and age was independent of sex and asthma.</p> <p>-> Lower ACE2 expression in children nasal epithelium relative to adults may help explain why COVID-19 is less prevalent in children.</p> <p>Limitation: study did not include individuals older than 60 years.</p>

Journal and date	Title	Authors and link	Field of expertise	Key facts
NEJM 19MAY2020	Respecting disability rights – towards improved crisis standards of care	Mello M. et al, US gotopaper	HSS/Politic	<p>Policymakers and hospitals can take key steps to honor commitments to antidiscrimination principles while appropriately stewarding scarce resources during a public health emergency.</p> <p>1- Do not use categorical exclusions. Patients must not be categorically excluded from access to treatment because of a disability or diagnosis. Consider not whether someone has a disability but patient’s prospects of benefiting from treatment.</p> <p>2- Do not use perceived quality of life = biases in how the public/physicians evaluate the quality of life of persons with disabilities.</p> <p>3- Use hospital survival and near-term prognosis but not long-term life expectancy. Predictions of long-term life expectancy are much more uncertain + prone to bias than predictions of short-term survival + affected by social circumstances (poverty). Ignoring near-term prognosis can produce outcomes inconsistent with responsible stewardship of scarce resources.</p> <p>4- Designate triage officers as the decision-makers and train them to respect disability rights. Include disability rights advocates in policy development and dissemination = it will also help in avoiding inflammatory language and ensure public understanding for operationalization.</p>
Clinical Infectious Diseases 19MAY2020	Early Short Course Corticosteroids in Hospitalized Patients with COVID-19	Fadel, Raef et al. USA gotopaper	Therapeutic	<p>Multi-center quasi-experimental study of 213 adult patients with confirmed moderate to severe COVID, 81 (38%) and 132 (62%) in SOC and early short course corticosteroid (methylprednisolone) groups, respectively. Outcomes were evaluated with a primary composite endpoint of escalation of care from ward to ICU, new requirement for mechanical ventilation, and mortality.</p> <p>- The composite endpoint occurred at a significantly lower rate in the early corticosteroid group (34.9% vs. 54.3%, p=0.005). Treatment effect observed within each individual component of the composite endpoint.</p> <p>- Significant reduction in median hospital length of stay was also observed in the early corticosteroid group (8 vs. 5 days, p < 0.001).</p> <p>- Multivariate regression analysis demonstrated an independent reduction in the composite endpoint at 14-days controlling for other factors (aOR: 0.41; 95% CI [0.22 – 0.77]).</p> <p>Conclusion: An early short course of methylprednisolone in patients with moderate to severe COVID-19 reduced escalation of care and improved clinical outcomes.</p> <p>Limitations: pragmatic quasi-experimental design was used and there are some differences in the baseline characteristics of the comparator groups ; limited follow up period of 14 days.</p>

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J Infect Dis 19MAY2020	Influence of storage conditions on SARS-CoV-2 nucleic acid detection in throat swabs	Li, Lin and al. China gotopaper	Virology	<p>For the detection of SARS-CoV-2 infection, samples often need to be shipped or inactivated before SARS-CoV-2 testing. In this study, we checked the influence of sample storage conditions on SARS-CoV-2 nucleic acid testing results, including sample inactivation time, storage temperature and the time.</p> <p>All of these conditions caused an increase in the Ct values of the nucleic acid tests and led to the misclassification of at least 10.2% of positive cases as negative or suspected.</p> <p>CL^o: results highlight the importance of immediate testing of samples for SARS-CoV-2 nucleic acid and detection.</p>
Lancet 19MAY2020	Epidemiology, clinical course, and outcomes of critically ill adults with COVID-19 in New York City: a prospective cohort study	Cummings MJ et al USA gotopaper	Clinic	<p>2 hospitals in NY – critically ill patient with COVID-19 – At least 28 days of observation</p> <p>1150 adults admitted COVID-19 which 257 (22%) were critically ill (included) Median age: 62 years – 67% male – 82% at least one comorbidity (HTA, diabetes) 46% had obesity</p> <p><u>Treatment</u></p> <ul style="list-style-type: none"> - 72% received hydroxychloroquine and 9% remdesivir - 26% received corticosteroid - 66% received vasopressor - 31% received RRT <p><u>Outcomes:</u></p> <ul style="list-style-type: none"> - 79% received IMV median of 18 days - 39% died (median of 9 days in the hospital) and 37% remained hospitalized <p><u>Association with in hospital death</u> (significantly)</p> <ul style="list-style-type: none"> - Older age aHR: 1,31 [1,09 – 1,57] per 10 years increase - Chronic cardiac disease aHR: 1,76 [1,08 – 2,86] - Chronic pulmonary disease aHR: 2,94 [1,48 – 5,84] - Concentration of IL-6 aHR: 1,11 [1,02 – 1,20] per decile increase - Concentration of D-dimer aHR: 1,10 [1,01 – 1,19] per decile increase <p>→ high frequency of IMV & in hospital mortality</p>
Nature Medicine 19MAY2020	Artificial intelligence-enabled rapid diagnosis of patients with COVID-19	Mei et al., USA gotopaper	Diagnostic	<p>Use of artificial intelligence (AI) algorithms to integrate chest CT findings with clinical symptoms, exposure history and laboratory testing to rapidly diagnose patients who are positive for COVID-19.</p> <p>-> In a test set of 279 patients, the AI system achieved an area under the curve of 0.92 and had equal sensitivity as compared to a senior thoracic radiologist.</p> <p>-> The AI system also improved the detection of patients who were positive for COVID-19 via RT-PCR who presented with normal CT scans, correctly identifying 17 of 25 (68%) patients, whereas radiologists classified all of these patients as COVID-19 negative</p> <p>When CT scans and associated clinical history are available, the proposed AI system can help to rapidly diagnose COVID-19 patients.</p>

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Circulation 19MAY2020	Deep Vein Thrombosis in Hospitalized Patients with Coronavirus Disease 2019 (COVID-19) in Wuhan, China: Prevalence, Risk Factors, and Outcome	Zang L et al, China gotopaper	Clinic	<p>Investigation of deep vein thrombosis (DVT) in hospitalized patient with COVID-19 143 patients from Jan 29 and Feb 29 <u>Demographic</u>: 51,7% man – median age= 63 46,1% (66) lower extremity DVT= 23 proximal DVT and 43 distal DVT <u>DVT vs no DVT</u>:</p> <ul style="list-style-type: none"> - Older - Lower oxygenation index - Higher rate of cardiac injury - Increase death (23 vs 9, p=0,001) <p><u>Multivariate analysis, DVT associated with</u></p> <ul style="list-style-type: none"> - CURB-65 score3-5, OR:6,12 - Padua prediction ≥ 4, OR: 4,01 - D-dimer>1μg/ml OR :5,81 <p><u>Predicting DVT</u> CURB-65 score3-5, Padua prediction score ≥ 4 + D-dimer>1 had Se 88% and Spe 61,4%</p> <p>→ prevalence of DVT is high → importance of prophylaxis for venous thromboembolism (Padua prediction score ≥ 4)</p>
Science 18MAY2020	Susceptible supply limits the role of climate in the early SARS-CoV-2 pandemic	Baker, Rachel E. et al. USA gotopaper	Climate	<p>Climate-dependent model to simulate SARS-CoV-2 pandemic, probing different scenarios based on known coronavirus biology.</p> <p>Results suggest:</p> <ul style="list-style-type: none"> • While climate may play a role in details of the size and timescales of an endemic outbreak, population immunity is a much more fundamental driver of pandemic invasion dynamics. • Both tropical and temperate locations should prepare for severe outbreaks and summertime temperatures will not effectively limit spread of infection. • Endemic cycles will likely be tied to climate factors and seasonal peaks may vary with latitude.
Cell 18MAY2020	Potent neutralizing antibodies against SARS-CoV-2 identified by high-throughput single-cell sequencing of convalescent patients' B cells	Yunlong Cao et al., Chine, gotopaper	Immunology	<p>Rapid and efficient identification of SARS-CoV-2 neutralizing antibodies achieved by high-throughput single-cell RNA and VDJ sequencing of antigen-binding B cells from 60 convalescent COVID-19 patients reveal over 8,500 antigen-binding B cell clonotypes expressing IgG1 antibodies.</p> <p>=> among of which,14 potent neutralizing mAbs were identified</p> <p>=> one of them, BD-368-2, exhibited an IC50 of 1.2 ng/mL and 15 ng/mL against pseudotyped and authentic SARS-CoV-2.</p> <p>=> in vivo experiments confirmed that BD-368-2 provide strong therapeutic efficacy and prophylactic protection against SARS-CoV-2, using the hACE2 transgenic mice model</p> <p>Conclusion: The potent neutralizing antibodies we identified may provide an effective therapeutic and prophylactic solution</p> <p>Limitation: deeper sequencing of the scRNA libraries is needed to further evaluate the effectiveness of removing exhausted memory B cells to improve the identification of neutralizing mAbs.</p>
Ann. Intern. Med. 18MAY2020	Tocilizumab for Hemophagocytic Syndrome in a Kidney Transplant Recipient With COVID-19	Faguer, Stanislas et al. France, gotopaper	Therapeutic	<p>Case Report describing an immunocompromised patient with COVID-19 and a related hemophagocytic syndrome who was treated with tocilizumab.</p> <p>The cytokine storm and multiorgan failure rapidly reversed, and the patient made a speedy recovery. On hospital day 30, the patient was breathing spontaneously with protective tracheotomy, and rehabilitation is ongoing.</p>

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The Lancet Diabetes & Endocrinology 18MAY2020	Prevalence of obesity among adult inpatients with COVID-19 in France	Causy, Cyrielle et al. France gotopaper	Population studies	<p>Lyon University Hospital admissions with BMI values: 340 patients with confirmed severe COVID-19 (68% non-critical and 32% critical COVID-19 patients) vs 1210 retrospective non-COVID-19 ICU patients admitted each year between 2007 - 2019.</p> <p>Results :</p> <ul style="list-style-type: none"> - 25% of severe COVID-19 patients had obesity, vs 15·3% in French adult population in 2014. -> Obesity prevalence 1·35 times higher in severe COVID-19 patients vs general French population. -> In ICU, obesity prevalence 1·89 times higher vs general population. -> Obesity prevalence higher in critical vs non-critical COVID-19 patients. <p>In agreement with preliminary data from 124 patients with critical COVID-19 and 306 ICU patients without COVID-19 from Lille University Hospital (Simonnet A et al. 2020) :</p> <ul style="list-style-type: none"> -> obesity prevalence 2·88 times higher in critical COVID-19 vs French general population -> Obesity prevalence higher in critical COVID-19 vs Lille ICU patients without COVID-19 (n=306). <p>=> Report significant association in obesity prevalence and severe COVID-19, including critical COVID-19, and suggests obesity => risk factor of pejorative evolution of COVID-19, increasing risk of ICU admission.</p>
Circulation 17MAY2020	Acute heart failure in multisystem inflammatory syndrome in children (MIS-C) in the context of global SARS-CoV-2 pandemic	Belhadjer S et al, France gotopaper	Clinic	<p>A series of children admitted to PICU for cardiogenic shock + left ventricular dysfunction + severe inflammatory state (14 centers)</p> <p>35 children – median age: 10 y [2 – 16]</p> <p>Comorbidities: 28% of the children which 17% were overweight</p> <p><u>Symptoms:</u> Fever and asthenia (100%) / Gastrointestinal symptoms (83%) / Respiratory distress (65%) – rhinorrhea (43%)</p> <p><u>Left ventricular ejection at baseline</u> < 30 for 28% / 30 to 50 for 72%</p> <p><u>Laboratory:</u> cytokine storm → high IL-6 and D-dimer (= macrophage activation) + elevation of CRP and PCT 88% were positive for SARS-CoV-2 (nasopharyngeal swabs or serology)</p> <p><u>Treatment:</u> 94% Respiratory support: invasive (62%) – noninvasive (32%) / 28% ECMO / 80% inotropic support / 100% IV globuline / 1/3 received steroid therapy</p> <p><u>At discharge:</u> 25/35 had left ventricular function restored - no death</p> <p>→ SARS-COV-2 + severe inflammatory state in children → acute cardiac decompensation</p>
The Journal of Antimicrobial Chemotherapy 17MAY2020	COVID-19 infection also occurs in patients taking hydroxychloroquine	Lahouati, M et al. France gotopaper	Therapeutic	<p>Report on two severe cases of COVID-19 in patients already using hydroxychloroquine for a long time to treat inflammatory disease.</p> <p>High plasma levels of hydroxychloroquine collected on admission in those cases confirm chronic exposure and adherence to hydroxychloroquine. These values are close to or higher than the EC50 described by Yao et al. not taking into account lung diffusion. Those potentially immunosuppressed patients do not represent the general population exposed to COVID-19.</p> <p>It cannot be excluded that chloroquine and hydroxychloroquine negatively impact the early inflammatory response to the virus and the risk of acquisition of infection owing to their anti-inflammatory activity.</p> <p>These observational data are not in favour of a universal protective effect of hydroxychloroquine, and clinicians should use it carefully, awaiting the results of clinical trials, particularly in the context of prevention.</p>

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Water research 16MAY2020	SARS-CoV-2 RNA in wastewater anticipated COVID-19 occurrence in a low prevalence area	Randazzo et al, Spain gotopaper	Public Health/Epidemiology	<p>Faecal shedding of SARS-CoV-2 RNA from COVID-19 patients has extensively been reported.</p> <p>We investigated the occurrence of SARS-CoV-2 RNA in six wastewater treatment plants serving the major municipalities within the Region of Murcia, Spain (low COVID-19 prevalence).</p> <p>-> The estimated quantification of SARS-CoV-2 RNA titers in untreated wastewater waters of $5.4 \pm 0.2 \log_{10}$ genomic copies/L on average.</p> <p>-> Two secondary water samples resulted positive (2/18) and all tertiary water samples tested as negative (0/12). SARS-CoV-2 RNA shedding in stools was present even before the first cases were reported by the authorities.</p> <p>This strategy could be implemented in environmental surveillance as an early indicator of the infection within a specific population.</p>
Developmental Cell 16MAY2020	Cigarette smoke exposure and inflammatory signaling increase the expression of the SARS-CoV-2 receptor ACE2 in the respiratory tract	Smith, Joan C. <i>et al.</i> USA gotopaper	Fundamental research	<p>Cigarette smoke causes dose-dependent upregulation of ACE2 receptor in rodent and human lungs.</p> <p>Single-cell sequencing data:</p> <ul style="list-style-type: none"> - ACE2 expressed in a subset of secretory cells in respiratory tract. - Chronic smoke exposure triggers expansion of this cell population and increased ACE2 expression. - Quitting smoking has converse effect (decreases this cell population and ACE2 levels). - ACE2 expression responsive to inflammatory signalling and upregulated by viral infections / interferon treatment. <p>-> May partially explain why smokers are particularly susceptible to severe SARS-CoV-2 infections</p> <p>-> identifies ACE2 as interferon-stimulated gene in lung cells -> possible positive-feedback loops increasing ACE2 levels and facilitating viral dissemination.</p>
J. Clin. Virol. 16MAY 2020	A combined oropharyngeal/nares swab is a suitable alternative to nasopharyngeal swabs for the detection of SARS-CoV-2	LeBlanc, Jason J. and al., Canada gotopaper	Diagnostic	<p>Given the global shortage of nasopharyngeal (NP) swabs typically used for respiratory virus detection, alternative collection methods were evaluated during the COVID-19 pandemic.</p> <p>This study showed that a combined oropharyngeal/nares swab is a suitable alternative to NP swabs for the detection of SARS-CoV-2, with sensitivities of 91.7% and 94.4%, respectively.</p>
The Lancet Infectious Diseases 15MAY2020	Risk factors for SARS-CoV-2 among patients in the Oxford Royal College of General Practitioners Research and Surveillance Centre primary care network: a cross-sectional study	Lusignan, Simon de et al. UK-South Africa gotopaper	Clinic	<p>Routinely collected, pseudonymised data for patients in the RCGP Research and Surveillance Centre primary care network +ve for SARS-CoV-2 (Jan 28 - April 4 2020):</p> <ul style="list-style-type: none"> - 587 SARS-CoV-2 +ve out of 3802 test results. - male sex independently associated with testing +ve (18 vs 13 % for women) <p>Clinical factors and demographics more likely to testing +ve :</p> <ul style="list-style-type: none"> - Adults, in particular ages 40-64, vs children (19 % in aged 40-64 vs 5 % in children) - People with chronic kidney disease (33 vs 14 % without chronic kidney disease), but no significant association with other chronic conditions. - Obese people (21 vs 13 % for people of normal weight) - Active smoking at decreased odds of testing +ve (11 vs 18 % in non-smokers) - black people vs white (62 vs 16 %) - People living in urban areas vs rural areas (26 vs 5-6% in rural areas) - People living in deprived areas (30 vs 8% in least deprived areas) <p>-> +ve SARS-CoV-2 test results in primary care cohort was associated with similar risk factors as for severe outcomes of COVID-19 in hospital settings, except for smoking.</p> <p>-> Provides evidence of potential sociodemographic factors associated with a +ve test : deprivation, population density, ethnicity and chronic kidney disease.</p>

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Gastroenterology 15MAY2020	Associations between Angiotensin Converting Enzyme Inhibitors and Angiotensin II Receptor Blocker Use, Gastrointestinal Symptoms, and Mortality among Patients with COVID-19	Tan, Nian-Di et al. China gotopaper	Therapeutic/ Clinic	<p>Retrospective cohort study of consecutive patients with COVID-19. Among the 100 participants with hypertension, 31 were classified as ACEI/ARB group and the remaining 69 were classified as non-ACEI/ARB group.</p> <p>Inpatient treatment with ACEI/ARB was associated with lower risk of digestive system involvement and lower risk of all-cause mortality compared with ACEI/ARB non-users in COVID-19 patients with hypertension.</p> <p>Limitations: small sample-size, possible unappreciated confounding effect.</p>
Science 15MAY2020	Serology assays to manage COVID-19	Krammer F., Simon V., USA gotopaper	Public Health/Epidemiol	<p>Measurement of antibodies to SARS-CoV-2 will improve disease management if used correctly.</p> <p>This perspective article describes the serological assays available and discusses the potential applications, including:</p> <ul style="list-style-type: none"> - understand the antibody responses mounted upon SARS-CoV-2 infection and vaccination; - inform on the prevalence of SARS-CoV-2 infection if different populations; - identification of donors for convalescent plasma therapy; - identify individuals who are immune (and the caveats concerning this point). <p>With high-quality serological assays now available, the key challenge will be to apply and deploy these tests in a strategic manner.</p>
Clinical microbiology and infection 15MAY2020	A multiple center clinical evaluation of an ultra-fast single-tube assay for SARS-CoV-2 RNA	Wang, Ji and al. China gotopaper	Diagnostic	<p>To evaluate the performance of an ultra-fast single-tube nucleic acid isothermal amplification detection assay for SARS-CoV-2 RNA using clinical samples from multiple centers.</p> <p>A reverse transcription recombinase-aided amplification (RT-RAA) assay for SARS-CoV-2 was conducted within 15minutes at 39°C with portable instruments after addition of extracted RNA. The clinical performance of RT-RAA assay was evaluated using 947 clinical samples and the approved commercial real-time fluorescent RT-PCR (qRT-PCR) kits were used for parallel detection. The sensitivity and specificity of RT-RAA were compared and analyzed.</p> <p>CI^o: with comparable sensitivity and specificity to the commercial qRT-PCR kits, RT-RAA assay for SARS-CoV-2 exhibited distinctive advantages of simplicity and rapidity in terms of operation and turn-around time.</p>
Science 15MAY2020	Inferring change points in the spread of COVID-19 reveals the effectiveness of interventions	Dehning et al., Germany gotopaper	PublicHealth/Epidemiology	<p>By combining an established epidemiological model with Bayesian inference -> analysis of the time dependence of the effective growth rate of new infections</p> <p>Focusing on COVID-19 spread in Germany, detection of change points in the effective growth rate that correlate well with the times of publicly announced interventions -> Possibility to quantify the effect of interventions, and we can incorporate the corresponding change points into forecasts of future scenarios and case numbers. This code is freely available and can be readily adapted to any country or region.</p>
Nature 14MAY2020	Proteomics of SARS-CoV-2-infected host cells reveals therapy targets	Bojkova, Denisa et al. Germany gotopaper	Therapeutic	<p>Identification of the host cell pathways modulated by SARS-CoV-2 infection and inhibition of these pathways showed to prevent viral replication in human cells. A human cell culture model for infection with SARS-CoV-2 clinical isolate was established. Employing this system, the SARS-CoV-2 infection profile was determined by translato3 and proteome proteomics at different times after infection. These analyses revealed that SARS-CoV-2 reshapes central cellular pathways, such as translation, splicing, carbon metabolism and nucleic acid metabolism. Small molecule inhibitors targeting these pathways prevented viral replication in cells.</p>

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Lancet 14MAY2020	Use of renin–angiotensin–aldosterone system inhibitors and risk of COVID-19 requiring admission to hospital: a case-population study	Abajo, Francisco J. De, et al. Spain gotopaper	Therapeutic/ Clinic	<p>Case-population study of consecutively selected hospitalized patients with a PCR-confirmed diagnosis of COVID-19, and randomly sampled ten patients per case, individually matched for age, sex, region, and date of admission to hospital as a reference group. 1139 cases and 11 390 population controls.</p> <p>Despite being matched on sex and age, a significantly higher proportion of cases had pre-existing cardiovascular disease (OR 1.98, 95% CI 1.62–2.41) and risk factors (1.46, 1.23–1.73) than did controls.</p> <p>The current use of RAAS inhibitors is not associated with an increased risk of COVID-19 requiring admission to hospital (including fatal cases and those admitted to an ICU) compared with other antihypertensive drugs. No substantial difference was observed between ACE inhibitors and angiotensin-receptor blockers, nor among short-term and long-term users. Sex, age, and background cardiovascular risk did not significantly affect the results, although use of RAAS inhibitors was associated with a reduced risk of COVID-19 requiring admission to hospital in patients with diabetes.</p> <p>Limitations: different data sources to extract information from cases and controls ; cases and controls were recorded at different dates ; data on smoking and other lifestyle habits not collected; observational study, residual confounding due to unmeasured or unknown confounders cannot be ruled out.</p>
BMJ 14MAY2020	Hydroxychloroquine in patients with mainly mild to moderate coronavirus disease 2019: open label, randomised controlled trial	Tang, Wei et al. China gotopaper	Therapeutic	<p>Multicentre, randomised, parallel, open label trial of hydroxychloroquine (1200 mg daily for three days, then 800 mg daily) versus standard of care in 150 patients admitted to hospital with covid-19.</p> <p>No evidence to support an increase in the probability of negative conversion of SARS-CoV-2 conferred by the addition of hydroxychloroquine administration to the current standard of care in patients admitted to hospital with mainly persistent mild to moderate covid-19. Adverse events, particularly gastrointestinal events, were more frequently reported in patients receiving hydroxychloroquine.</p> <p>Limitations: open label ; use of sequential envelopes for randomisation ; no patients at the early stage of disease ; 148/150 (99%) patients had mild to moderate disease ; underpowered sample size due to the lack of enough eligible patients to enrol.</p>
American journal of obstetrics and gynecology 14MAY2020	Clinical Characteristics of 46 Pregnant Women with a SARS-CoV-2 Infection in Washington State	Lokken EM et al, USA gotopaper	Clinic	<p>Description of maternal disease and obstetrical outcomes – 6 hospital in Washington state</p> <p>46 pregnant women</p> <p>Demographic: median age: 29y – 6,5% in first & 43,4% second & 50% in third trimester</p> <p>26,1% had at least one comorbidity: asthma – hypertension – diabetes -</p> <p>28,6% were overweight and 35,7% obese</p> <p>Symptoms: 93,5% had one – cough (70%) – fever (51%) – dyspnea – headache</p> <p>Outcomes:</p> <ul style="list-style-type: none"> - 15% categorized has severe disease: overweight/obese/comorbidity - 16% hospitalized & 1 to ICU (all severe disease) - 8 delivered during the study period (median: 38,4 week) - 1 stillbirth: unknown etiology <p>→ higher risk group: chronic comorbidity / obese / overweight</p>

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Clinica Chimica Acta 14MAY2020	The underlying changes and predicting role of peripheral blood inflammatory cells in severe COVID-19 patients: a sentinel?	Sun, Da-wei and al. China gotopaper	Virology	<p>The underlying changes of peripheral blood inflammatory cells (PBICs) in COVID-19 patients are little known. Moreover, the risk factors for the underlying changes of PBICs and their predicting role in severe COVID-19 patients remain uncertain.</p> <p>This retrospective study includes two cohorts: the main cohort enrolling 45 patients of severe type serving as study group, and the secondary cohort enrolling 12 patients of no-severe type serving as control group. The PBICs analysis was based on blood routine and lymphocyte subsets. The inflammatory cell levels were compared among patients according to clinical classifications, disease-associated phases, as well as one-month outcomes.</p> <p>Results: the patients of severe type suffered from significantly decreased counts of lymphocytes, eosinophils, basophils, but increased counts of neutrophils. These PBICs alterations got improved in recovery phase, but persisted or got worse in aggravated phase.</p> <p>CI^o: lymphopenia and eosinopenia may serve as predictors of disease severity and disease progression in COVID-19 patients, and enhancing the cellular immunity may contribute to COVID-19 treatment. Thus, PBICs might become a sentinel of COVID-19, and it deserves attention during COVID-19 treatment</p>
Journal of Allergy and Clinical Immunology 14MAY2020	Complement activation in patients with COVID-19: a novel therapeutic target	Cugno, Massimo et al. Italy gotopaper	Therapeutic	<p>Preliminary data providing evidence of complement activation in patients with COVID-19 with different degrees of respiratory failure. Investigation of the plasma levels of sC5b-9 and C5a as markers of complement activation in 31 COVID-19 patients, compared with 27 healthy subjects.</p> <ul style="list-style-type: none"> - Plasma levels of sC5b-9 were significantly higher in the patients with moderate disease and those with severe disease than in the healthy controls, and significantly higher in the patients with severe disease than in those with moderate disease. - The plasma levels of C5a were higher in the patients with moderate disease and those with severe disease than in the healthy (P=0.0001 for both), with no statistically significant difference between the two patient groups. - The cohort of patients had increased levels of acute-phase proteins and coagulation system abnormalities. <p>Complement activation may contribute to the development of lung and endothelial damage in patients. Possibility that the coronavirus may directly cause damage to endothelial cells.</p>
BMJ 14MAY2020	Clinical efficacy of hydroxychloroquine in patients with covid-19 pneumonia who require oxygen: observational comparative study using routine care data	Mahévas, Matthieu et al. France gotopaper	Therapeutic	<p>Comparative study that uses real world data collected from routine care to assess the efficacy and safety of hydroxychloroquine in a population of 181 patients admitted to hospital with covid-19 hypoxaemic pneumonia.</p> <ul style="list-style-type: none"> - Hydroxychloroquine treatment at 600 mg/day added to standard care was not associated with a reduction of admissions to the intensive care unit or death 21 days after hospital admission compared with standard care alone. - The rate of survival without acute respiratory distress syndrome did not increase. - Eight patients in the treatment group (10%) experienced electrocardiographic modifications that required discontinuation of treatment. <p>The results of this study do not support its use in patients admitted to hospital with covid-19 who require oxygen. Limitations: observational data, centre effect not taken into account ; limited sample ; only patients admitted to hospital.</p>

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Clinical Infectious Disease 14MAY2020	Risk Factors of Severe Disease and Efficacy of Treatment in Patients Infected with COVID-19: A Systematic Review, Meta-Analysis and Meta-Regression Analysis	Zhang, John J. Y et al. Singapore gotopaper	Therapeutic/ Clinic	<p>Systematic review and meta-analysis on COVID-19 clinical features and/or treatment outcomes.</p> <p>45 studies reporting 4203 patients were included. Pooled rates of intensive care unit (ICU) admission, mortality and acute respiratory distress syndrome (ARDS) were 10.9%, 4.3% and 18.4%, respectively.</p> <ul style="list-style-type: none"> - On meta-regression, ICU admission was predicted by raised leukocyte count ($p < 0.0001$), raised alanine aminotransferase ($p = 0.024$), raised aspartate transaminase ($p = 0.0040$), elevated lactate dehydrogenase (LDH) ($p < 0.0001$) and increased procalcitonin ($p < 0.0001$). - ARDS was predicted by elevated LDH ($p < 0.0001$), while mortality was predicted by raised leukocyte count ($p = 0.0005$) and elevated LDH ($p < 0.0001$). - Treatment with lopinavir-ritonavir showed no significant benefit in mortality and ARDS rates. Corticosteroids were associated with a higher rate of ARDS ($p = 0.0003$). <p>Limitations: possible selection bias (publications in English) ; only studies from Asia at the time of the literature search ; studies included were observational ; heterogeneity in the range of symptoms and comorbidities recorded in the different studies.</p>
Nature 14MAY2020	Infection of dogs with SARS-CoV-2	Sit, Thomas H. C Hong Kong gotopaper	Fundamental research	<p>2/15 dogs from households with confirmed human COVID-19 cases in Hong Kong were found to be infected (qRT-PCR, serology, viral genome sequencing, and virus isolation in 1 dog):</p> <ul style="list-style-type: none"> - a 17yr-old male Pomeranian (SARS-CoV-2 RNA detected from 5 nasal swabs over 13-days). - a 2.5yr-old male German Shepherd dog (SARS-CoV-2 RNA on two occasions and virus isolated from nasal and oral swabs) - Both had antibody responses (plaque reduction neutralization assays). - Viral genetic sequences from both dogs were identical to virus detected in respective human cases. Animals asymptomatic during quarantine. <p>-> These are instances of human-to-animal transmission of SARS-CoV-2. Unclear whether infected dogs can transmit the virus to other animals or back to humans.</p>
Nature 14MAY2020	Pathogenesis and transmission of SARS-CoV-2 in golden hamsters	Sia, Sin Fun et al. Hong Kong gotopaper	Animal model	<p>Pathogenesis and transmissibility of the SARS-CoV-2 in golden Syrian hamsters (intranasal infection):</p> <ul style="list-style-type: none"> - viral antigens (immunohistochemistry) in nasal mucosa, bronchial epithelial cells and in areas of lung on 2 and 5 dpi, followed by rapid viral clearance and pneumocyte hyperplasia on 7 dpi. - Viral antigen found in duodenum epithelial cells and viral RNA in feces. <p>-> Efficient SARS-CoV-2 transmission from inoculated hamsters to naïve by direct contact and via aerosols. Transmission via fomites less efficient.</p> <p>-> Communicable period was short and correlated with detection of infectious virus but not viral RNA.</p> <p>-> Inoculated and naturally-infected hamsters showed apparent weight loss, and all animals recovered with detection of neutralizing antibodies.</p>
Proc. Natl. Acad. Sci. U. S. A. 13MAY2020	The airborne lifetime of small speech droplets and their potential importance in SARS-CoV-2 transmission	Stadnytskyi et al. USA gotopaper	Public Health/Epidemiology	<p>Speech droplets generated by asymptomatic carriers of SARS-CoV-2 likely to be a mode of disease transmission.</p> <p>-> Highly sensitive laser light scattering observations have revealed that loud speech can emit thousands of oral fluid droplets per second.</p> <p>-> In a closed, stagnant air environment, they disappear from the window of view with time constants in the range of 8 to 14 min (droplet nuclei of ca. 4 μm diameter, or 12- to 21-μm droplets prior to dehydration).</p> <p>There is therefore a substantial probability that normal speaking causes airborne virus transmission in confined environments.</p>

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Science 13MAY2020	Estimating the burden of SARS-CoV-2 in France	Salje et al., France gotopaper	Public Health/Epidemiology	<p>Using models applied to hospital and death data, we estimate the impact of the lockdown and current population immunity in France.</p> <p>-> We find 3.6% of infected individuals are hospitalized and 0.7% die (0.001% in <20 years of age (ya), 10.1% in >80ya). The lockdown reduced the reproductive number from 2.90 to 0.67 (77% reduction). By 11 May 2020, when interventions are scheduled to be eased, we project that 4.4% (range: 2.8–7.2) of the population will have been infected.</p> <p>Population immunity appears insufficient to avoid a second wave if all control measures are released at the end of the lockdown</p>
Ann. Intern. Med. 13MAY2020	Variation in False-Negative Rate of Reverse Transcriptase Polymerase Chain Reaction–Based SARS-CoV-2 Tests by Time Since Exposure	Kucirka, Lauren M. and al. USA gotopaper	Virology	<p>Tests for SARS-CoV-2 based on RT-PCR are being used to “rule out” infection among high-risk persons, such as exposed inpatients and health care workers. It is critical to understand how the predictive value of the test varies with time from exposure and symptom onset to avoid being falsely reassured by negative test results.</p> <p>Objective: To estimate the false-negative rate by day since infection.</p> <p>CI°: care must be taken in interpreting RT-PCR tests for SARS-CoV-2 infection—particularly early in the course of infection—when using these results as a basis for removing precautions intended to prevent onward transmission. If clinical suspicion is high, infection should not be ruled out on the basis of RT-PCR alone, and the clinical and epidemiologic situation should be carefully considered.</p>
N. Engl. J. Med. 13MAY2020	Multiorgan and Renal Tropism of SARS-CoV-2	Puelles, Victor G. et al Germany gotopaper	Cellular tropism	<p>Autopsy series from 22 patients who died from Covid-19:</p> <ul style="list-style-type: none"> - 77% had more than 2 coexisting conditions, and greater coexisting conditions associated with SARS-CoV-2 tropism for kidneys. - highest SARS-CoV-2 copies per cell = respiratory tract, - lower viral copies per cell = kidneys, liver, heart, brain, and blood. <p>Kidney tissue microdissection from 6 patients :</p> <ul style="list-style-type: none"> - 3 = detectable SARS-CoV-2 viral load in all kidney compartments examined, with preferential targeting of glomerular cells. -> SARS-CoV-2 organotropism beyond respiratory tract includes heart, liver, brain, and kidneys. Renal tropism is a potential explanation of commonly reported new clinical signs of kidney injury in Covid-19 patients
The Journal of Molecular Diagnostics 13MAY2020	Detection of SARS-CoV-2 is comparable in clinical samples preserved in saline or viral transport media	Radbel, Jared and al. USA gotopaper	Virology	<p>The availability of viral transport media (VTM) has become severely limited, contributing to delays in diagnosis and rationing of diagnostic testing.</p> <p>The phosphate buffered saline (PBS) may be a viable transport medium, as an alternative to VTM, for clinical qPCR testing. We assessed the intra- and inter-individual reliability of SARS-CoV-2 qPCR in clinical endotracheal secretion samples transported in VTM or PBS, evaluating the stability of the RT-qPCR signal for three viral targets (N gene, ORF1ab, and S gene) when samples were stored in these media at room temperature for up to 18 hours.</p> <p>Results: using PBS as a transport medium has high intra- and inter-individual reliability, maintains viral stability, and is comparable to VTM in the detection of the three SARS-CoV-2 genes through 18 hours of storage.</p> <p>CI°: PBS as a clinically useful medium for transporting and short-term preservation of specimens containing SARS-CoV-2 has the potential to increase testing capacity for SARS-CoV-2</p>

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Lancet 13MAY2020	An outbreak of severe Kawasaki-like disease at the Italian epicentre of the SARS-CoV-2 epidemic: an observational cohort study	Verdoni L et al Italy gotopaper	Clinic	<p>29 children with Kawasaki disease Group1(n=19): before SARS-CoV-2 outbreak Group2(n=10): after SARS-CoV-2 outbreak <u>Group1 versus group2:</u></p> <ul style="list-style-type: none"> - Higher incidence in group2: 0,3 vs 10/month (p<0,05) - Older group2: 3,0 vs 7,5 y (p<0,05) - Abnormal echocardiogram: 60%(grp2) vs 10%(grp1), p<0,05 - More MAS group2: 50% vs 0% <p>→ 30-fold increased incidence of KD in the past month</p> <p>→ SARS-CoV-2 outbreak is associated with high incidence of severe form of KD</p>
Nature Medicine 13MAY2020	Infection of bat and human intestinal organoids by SARS-CoV-2	Zhou, Jie et al. Hong Kong gotopaper	Fundamental research	<p>Establishment and characterization of intestinal organoids derived from horseshoe bats (<i>Rhinolophus sinicus</i>) can recapitulate bat intestinal epithelium:</p> <ul style="list-style-type: none"> - bat enteroids are fully susceptible to SARS-CoV-2 infection and robust viral replication. - human intestinal organoids also sustain active replication of SARS-CoV-2 <p>-> First expandable organoid culture system of bat intestinal epithelium and evidence that SARS-CoV-2 can infect bat intestinal cells.</p> <p>-> Robust SARS-CoV-2 replication in human intestinal organoids suggests that the human intestinal tract might be a transmission route of SARS-CoV-2.</p>
JAMA 13MAY2020	SARS-CoV-2 Rates in BCG-Vaccinated and Unvaccinated Young Adult	Hamiel et al., Israel gotopaper	Vaccine	<p>The BCG vaccine was routinely administered to all newborns in Israel as part of the national immunization program between 1955 and 1982</p> <p>Since 1982, the vaccine has been administered only to immigrants from countries with high prevalence of tuberculosis. This change allowed comparison of infection rates and proportions with severe COVID-19 disease in 2 similar populations with differing BCG status: individuals born during the 3 years before and 3 years after cessation of the universal BCG vaccine program.</p> <p>-> This study does not support the idea that BCG vaccination in childhood has a protective effect against COVID-19 in adulthood.</p>
Annals of Internal Medicine 12MAY2020	Pharmacokinetics of Lopinavir and Ritonavir in Patients Hospitalized With Coronavirus Disease 2019 (COVID-19)	Schoergenhofer, Christian et al. Austria gotopaper	Therapeutic	<p>First pharmacokinetic data of lopinavir and ritonavir in patients hospitalized with COVID-19. Series of 8 patients.</p> <ul style="list-style-type: none"> - Lopinavir trough levels were approximately 2-fold higher in this population than in patients with HIV receiving the same dose (7.1 µg/mL). - A correlation of drug concentrations with C-reactive protein, a downstream marker of IL-6, was observed. <p>However, approximately 60- to 120-fold higher concentrations are required to reach the assumed EC50 at trough levels, making effective treatment of COVID-19 with lopinavir and ritonavir at the currently used doses unlikely.</p> <p>Limitations: only trough levels were quantified, more detailed pharmacokinetics not available ; no data on the half-maximal effective dose of lopinavir for SARS-CoV-2 in vivo.</p>

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Nature 12MAY2020	Respiratory disease in rhesus macaques inoculated with SARS-CoV-2	Munster, Vincent J. et al. USA gotopaper	Animal model	<p>SARS-CoV-2 causes respiratory disease in infected rhesus macaques, with disease lasting 8-16 days:</p> <ul style="list-style-type: none"> - 8 adult rhesus macaques (4 males, 4 females, age 4-6 yrs) inoculated with combination of intranasal (0.5ml per nostril), intratracheal, oral and ocular of a 4×10^5 TCID₅₀/ml (3×10^8 genome copies/ml). - Pulmonary infiltrates visible in lung radiographs - High viral load in nose and throat swabs and bronchoalveolar lavages of all animals. - prolonged rectal shedding detected in 1 animal <p>-> Rhesus macaque recapitulates moderate disease with regard to virus replication, shedding, presence of pulmonary infiltrates, histological lesions and seroconversion.</p>
Nat Med 12MAY2020	A serological assay to detect SARS-CoV-2 seroconversion in humans	Amanat et al., USA gotopaper	Diagnostic	<p>Describing a serological enzyme-linked immunosorbent assay for the screening and identification of human SARS-CoV-2 seroconverters.</p> <ul style="list-style-type: none"> -> based on reactivity to the immunogenic S protein of the virus, is relatively simple and quick in its execution and can be performed at biosafety level 2 -> there is no or only negligible cross-reactivity from human coronaviruses to SARS-CoV-2 in the tested individuals -> strong seroconversion with ELISA AUC values in the 1:1,000 range after natural infection with SARS-CoV-2 <p>Analyses on 69 consecutive patients with lung cancers who were diagnosed with COVID-19. Severity based on no or prior receipt of PD-1 blockade was examined.</p>
Cancer discovery 12MAY2020	Impact of PD-1 blockade on severity of COVID-19 in patients with lung cancers	Luo, Jia et al. USA gotopaper	Therapeutic/ Clinic	<ul style="list-style-type: none"> - Overall, the severity of COVID-19 in patients with lung cancer was high, including need for hospitalization in more than half of patients and death in nearly a quarter. - Prior PD-1 blockade was, as expected, associated with smoking status. - After adjustment for smoking status, PD-1 blockade exposure was not associated with increased risk of severity of COVID-19. PD-1 blockade does not appear to impact the severity of COVID-19 in patients with lung cancers. <p>These initial results in patients with lung cancers support the safety of PD-1 blockade treatment to achieve optimal cancer outcomes.</p>
JAMA Intern Med 12MAY2020	Development and Validation of a Clinical Risk Score to Predict the Occurrence of Critical Illness in Hospitalized Patients With COVID-19	Liang W et al, China gotopaper	Clinic	<p>Develop and validate a clinical score at admission for predicting critical illness</p> <p>Retrospective cohort (575 hospital in China)</p> <p><u>1590 patients with data were include for variable selection:</u></p> <ul style="list-style-type: none"> - Mean age: 48,9y – 57,3% were men – 25,1% had at least 1 comorbidity - 72 variables entered in selection process (LASSO and logistic regression) <p><u>10 variables were independently statistically significant predictors of critical illness:</u></p> <ul style="list-style-type: none"> - CXR abnormality: OR: 3,39 - Age OR: 1,03 - Hemoptysis OR 4,53 - Dyspnea OR 1,88 - Unconsciousness OR 4,71 - Number of comorbidities OR 1,60 - Cancer history OR 4,07 - Neutrophil to lymphocyte ratio OR 1,06 - Lactate dehydrogenase OR: 1,002 - Direct bilirubin OR: 1,15 <p><u>Validation:</u> cohort of 710 patients AUC of COVID-GRAM 0,88 IC_{95%} [0,84 – 0,93]</p> <p><u>Limitations:</u> data are entirely from China -> risk score at the admission for predicting critical illness</p>

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JAMA 11MAY2020	Association of Treatment With Hydroxychloroquine or Azithromycin With In-Hospital Mortality in Patients With COVID-19 in New York State	Rosenberg, Eli S. et al. USA gotopaper	Therapeutic	<p>Retrospective multicenter cohort study of 1438 hospitalized patients who received both hydroxychloroquine and azithromycin, hydroxychloroquine alone, azithromycin alone, or neither.</p> <p>=> Compared with patients receiving neither drug, there were no significant differences in mortality for patients receiving hydroxychloroquine + azithromycin (HR, 1.35 [95% CI, 0.76-2.40]), hydroxychloroquine alone (HR, 1.08 [95% CI, 0.63-1.85]), or azithromycin alone (HR, 0.56 [95% CI, 0.26-1.21]).</p> <p>=> Compared with patients receiving neither drug, cardiac arrest was significantly more likely in patients receiving hydroxychloroquine + azithromycin (adjusted OR, 2.13 [95% CI, 1.12-4.05]), but not hydroxychloroquine alone (adjusted OR, 1.91 [95% CI, 0.96-3.81]) or azithromycin alone (adjusted OR, 0.64 [95% CI, 0.27-1.56]).</p> <p>=> No significant differences in the relative likelihood of abnormal electrocardiogram findings.</p> <p>Limitations: mortality limited to in-hospital death ; potential confounders such as inflammatory markers were not frequently measured ; confidence intervals for some of the findings are wide, reflecting limits in study power for some analyses</p>
Bio-design and manufacturing 11MAY2020	Development of a rapid test kit for SARS-CoV-2: an example of product design	Cui, Zhanfeng and al. China gotopaper	Diagnostic	<p>The urgent need for large numbers of tests in field setting imposes constraints such as short test time and lack of access to specialist equipment, laboratories and skilled technicians to perform the test and interpret results.</p> <p>To meet these needs, an antigen test based on RT-LAMP with colorimetric readout was chosen. Direct use of swab sample with no RNA extraction was explored.</p> <p>After extensive experimental study, a rapid test kit has been fabricated to satisfy all design criteria</p>
J. Clin. Microbiol. 11MAY2020	Open Development and Clinical Validation Of Multiple 3D-Printed Nasopharyngeal Collection Swabs: Rapid Resolution of a Critical COVID-19 Testing Bottleneck	Callahan, Cody J. and al. USA gotopaper	Diagnostic	<p>To address the shortage of the nasopharyngeal swabs, we designed and executed a translational-research program to allow immediate mass production by 3D printing.</p> <p>We validated four prototypes through an institutional review board (IRB)-approved clinical trial that involved 276 outpatient volunteers.</p> <p>Each participant was swabbed with a reference swab (the control) and a prototype, and SARS-CoV-2 reverse-transcriptase polymerase chain reaction (RT-PCR) results were compared.</p> <p>All prototypes displayed excellent concordance with the control. Contact information for ordering can be found at http://printedswabs.org</p>
Nature Medicine 11MAY2020	Real-time tracking of self-reported symptoms to predict potential COVID-19	Menni et al, UK gotopaper	Public Health/Epidemiology	<p>A total of 2,618,862 participants reported their potential symptoms of COVID-19 on a smartphone-based app.</p> <p>-> Of 18,401 who had undergone a SARS-CoV-2 test, participants reporting loss of smell and taste was 65.03% in those with a positive test result and 21.72% in those with a negative test result (odds ratio = 6.74; 95% CI = 6.31–7.21).</p> <p>->A model combining symptoms to predict probable infection was applied to the data from all app users who reported symptoms (805,753) and predicted that 140,312 (17.42%) participants are likely to have COVID-19</p>

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Journal of Allergy and Clinical Immunology 11MAY2020	Safety and efficacy of early high-dose IV anakinra in severe COVID-19 lung disease	Pontali, Emanuele et al. Italy gotopaper	Therapeutic	<p>Pilot study of early use of high IV doses of anti-IL-1 anakinra in 5 patients with severe/moderate COVID-19 with pulmonary involvement.</p> <p>->All five patients experienced rapid resolution of systemic inflammation, and remarkable improvement of respiratory parameters, with reduction of oxygen support requirement and early amelioration of chest CT scan abnormalities before discharge in 3 patients.</p> <p>-> All patients were discharged 6 to 13 days after the start of anakinra.</p> <p>-> No secondary infections or other adverse events were observed.</p> <p>Limitations: non-controlled study ; small size ; short-term duration of the treatment ; variability of laboratory biomarkers.</p>
Clin. Infect. Dis. 11MAY2020	Hydroxychloroquine in COVID-19 patients: what still needs to be known about the kinetics	Martin-Blondel, G. et al. France gotopaper	Therapeutic	<p>Aim: to determine whether or not the pharmacokinetics in systemic lupus erythematosus (SLE) patients can be applied to COVID-19 patients.</p> <p>Different dosage regimens were applied based on data that emerged: regimen 1 (200 mg x 3/day), regimen 2 (400 mg x 2 on day 1 followed by 200 mg x 3/day), regimen 3 (400 mg x 2 on day 1 followed by 400 mg x 1/day) and regimen 4 (600 mg x 2 followed by 400 mg x 1 /day).</p> <p>Blood samples (n=101) were collected from 57 COVID-19 patients for 7 days and concentrations were compared with simulated kinetic profiles.</p> <p>⇒ Hydroxychloroquine exposure tends to be low and in most instances lower than the values reported in SLE patients, in particular for the standard regimen of “200 mg x 3/day”.</p> <p>⇒ The pharmacokinetic behavior in COVID-19 patients cannot be predicted by the SLE population or by rheumatoid arthritis patients.</p>
European heart journal 11MAY2020	Characteristics and clinical significance of myocardial injury in patients with severe coronavirus disease 2019	Shi S and al, China gotopaper	Clinic	<p>671 hospitalized patients COVID-19 Median age: 63 years Main comorbidities: hypertension (29,7%) –diabetes (14,5%) – CHD(9%) Case fatality rate 9,2%</p> <p><u>Death versus survivor group</u></p> <ul style="list-style-type: none"> - Older and more often male (p<0,001) - More comorbidities (p<0,001) - More myocardial injury: 75,8% vs 9,7% (p<0,001) <p><u>Cardiac troponin I predicting in-hospital mortality:</u></p> <ul style="list-style-type: none"> - AUC 0,92 - Se 86% and Spe 86% - Single cut-off concentrations 73 µg/L <p><u>Predictor of myocardial injury:</u></p> <ul style="list-style-type: none"> - Older age – comorbidities - High level of CRP <p>Limitation: small sample size, cause of death or myocardial injury underestimated → CtnI and CK-MB predict risk for in hospital mortality</p>

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JAMA ped 11MAY2020	Characteristics and Outcomes of Children with Coronavirus Disease 2019 (COVID-19) Infection Admitted to US and Canadian Pediatric Intensive Care Units	Shekerdeman LS and al, USA gotopaper	Clinic	<p>46 PICU (March 14 and April 3) → 48 children (40 in US & 6 in Canada) Median age: 13 years [4,2 – 16,6] Comorbidities (83%) Median PICU length of stay: 5 days Respiratory symptoms: 73 % → 39/48 required ventilatory support: 21 non-invasively and 19 IMV Specific therapies (28/46): Hydroxychloroquine or hydroxy+azithro or remdesivir or tocilizumab Case fatality rate: 4,2% (2/48) → pre-hospital comorbidities = important factor</p>
Emerging Infectious Disease journal 08MAY2020	Prolonged Persistence of SARS-CoV-2 RNA in Body Fluids	Jiufeng Sun and al. gotopaper	Virology	<p>To estimate the frequency and duration of detectable SARS-Cov-2 RNA in human body fluids. The prolonged persistence of virus RNA in various body fluids may guide the clinical diagnosis and prevention of onward virus transmission.</p> <p>43 patients with mild cases of COVID-19 - 490 specimens collected.</p> <p>Results: through an AFT-based modeling study: persistent shedding of virus RNA in nasopharyngeal swab and feces samples. The estimated time until loss of virus RNA detection ranged from 45.6 days for nasopharyngeal swab samples to 46.3 days for feces samples in mild cases and from 48.9 days for nasopharyngeal swab samples to 49.4 days for feces samples in severe cases (longer than those for SARS-Cov and MERS-Cov).</p> <p>CI*: results show prolonged persistence of SARS-CoV-2 RNA in hospitalized patients with COVID-19. Health professionals should consider these findings in diagnostic recommendations and prevention measures for COVID-19.</p>
Pediatric Blood Cancer 08MAY2020	COVID-19 infection in children and adolescents with cancer in Madrid	De Roja T and al, Spain gotopaper	Clinic	<p>15 pediatric oncology patients Median age: 10,6 years [0,6 – 18,6]</p> <p>Hematological malignancy (73%) and solid tumor (27%) 60% received chemotherapy in the 15 days before infection</p> <p>Symptoms: fever (67%) – cough (40%) – asymptomatic (13%) Radiological finding: 8/14 pathological findings</p> <p>2 patients received oxygen therapy Median hospital stays: 8 days</p> <p>All favorable outcome → prevalence among children with cancer in Madrid: 1,3% → mild symptomatic and better prognosis than adults 64 pregnant women hospitalized: 44 severe and 20 critical – no death</p>
American Journal of Obstetrics & Gynecology MFM 08MAY2020	Clinical course of severe and critical COVID-19 in hospitalized pregnancies: a US cohort study	Rebecca Am, and al USA gotopaper	Clinic	<p>64 pregnant women hospitalized: 44 severe and 20 critical – no death</p> <p>Gestational age at admission: 30 ± 6 weeks Admission: 7 days after onset symptoms Majoration of dyspnea at day 8 and MV at day 9 Median duration of hospital stays: 6 day for severe and 12 for critical</p> <p>Delivery preterm: 75% of critical women - Severe: 37 ± 2 - Critical: 32 ± 4</p> <p>Critical cases: 95% required MV - 70% ARDS - 20% prone position</p> <p>Neonate: - 64% need ICU - One tested positive at 48-h without any symptoms</p> <p>→ clinical course not different from not pregnant women → pregnancy should not be considered an independent risk of factor</p>

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Cell 08MAY2020	Host-viral infection maps reveal signatures of severe COVID-19 patients	Bost, Pierre; et al. Israel-France-China gotopaper	Fundamental research	<p>Viral-Track, a new computational method to analyze host-viral infection maps :</p> <ul style="list-style-type: none"> - enables transcriptional sorting of infected vs bystander cells and reveals virus-induced expression (scans unmapped scRNA-seq data for presence of viral RNA). - Applicable to multiple models of infection (HBV, HIV, VSV, etc) <p>Applied to Bronchoalveolar-Lavage samples from severe vs mild COVID-19 patients, reveals:</p> <ul style="list-style-type: none"> - SARS-CoV-2 infects epithelial cells and alters immune landscape in severe patients. - detected unexpected coinfection with hMPV (human MetaPneumoVirus) mainly in monocytes, dampening interferon response. <p>-> robust technology for dissecting mechanisms of viral-infection and pathology.</p>
Lancet 08MAY2020	Triple combination of interferon beta-1b, lopinavir-ritonavir, and ribavirin in the treatment of patients admitted to hospital with COVID-19: an open-label, randomised, phase 2 trial	Hung, Ivan Fan-Ngai et al. China gotopaper	Therapeutic	<p>Multicentre, prospective, open-label, randomised, phase 2 trial in 127 adults with COVID-19 hospitalized in Hong Kong. Random assignment (2:1) to the combination group (lopinavir-ritonavir + ribavirin+ interferon beta-1) or to the control group (lopinavir-ritonavir).</p> <p>=> The triple combination, when given within 7 days of symptom onset, is effective in suppressing the shedding of SARS-CoV-2, not just in a nasopharyngeal swab, but in all clinical specimens, compared with lopinavir-ritonavir alone.</p> <p>=> The significant reductions in duration of RT-PCR positivity and viral load were associated with clinical improvement as shown by the significant reduction in NEWS 2 and duration of hospital stay.</p> <p>=> Subgroup comparison suggested interferon beta-1b to be a key component of the combination treatment.</p> <p>Limitations: open label, no placebo group, confounded by a subgroup omitting interferon beta-1b within the combination group, no critically ill patients.</p>
Science 08MAY2020	A highly conserved cryptic epitope in the receptor-binding domains of SARS-CoV-2 and SARS-CoV	Yuan, Meng; et al. USA-China gotopaper	Fundamental research	<p>Crystal structure of CR3022 (neutralizing antibody from convalescent SARS-CoV infected patient) in complex with the receptor-binding domain of the SARS-CoV-2 spike :</p> <ul style="list-style-type: none"> - 3.1a resolution <p>-> CR3022 targets a highly conserved epitope (conserved in SARS-CoV-2 and SARS-CoV) that is distal from the receptor binding site, and enables cross-reactive binding between SARS-CoV-2 and SARS-CoV.</p> <ul style="list-style-type: none"> - CR3022 likely binds more tightly to SARS-CoV because its epitope contains a glycan absent in SARS-CoV-2. <p>-> Modeling showed this epitope only accessible when at least 2 of the 3 spike proteins are in a conformation competent to bind the receptor.</p>
Science 08MAY2020	Harnessing multiple models for outbreak management	Shea et al, USA gotopaper	Public Health/Epidemiology	<p>COVID-19 pandemic has triggered the development of several valuable models that can differ in various elements and provide disparate predictions, which could ultimately hinder intervention planning and response by policymakers.</p> <p>We advocate a more systematic approach, by merging two well-established research fields.</p> <ol style="list-style-type: none"> 1. Formal expert elicitation methods applied to multiple models to deliberately generate, retain, and synthesize valuable individual model ideas and share important insights during group discussions, while minimizing various cognitive biases. 2. Using a decision-theoretic framework to capture and account for within- and between-model uncertainty as we evaluate actions in a timely manner to achieve management objectives.

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JAMA 08MAY2020	Changes in SARS-CoV-2 Positivity Rate in Outpatients in Seattle and Washington State, March 1-April 16, 2020	Randhawa et al, USA gotopaper	Public Health/Epidemiology	<p>Patient demographics: SARS-CoV-2 positivity rates were 8.2% in Washington State outpatient clinics, 8.4% in Seattle-area outpatient clinics, and 14.4% in Seattle EDs.</p> <p>The SARS-CoV-2 positivity rate was analysed by fitting penalized cubic regression splines to binomial testing data, and accounting for variation in the daily testing totals. SARS-CoV-2 positivity rate was 17.6% in the outpatient clinics and 14.3% in EDs at the peak period and 3.8% and 9.8%, respectively, at the end of the analysis period.</p> <p>SARS-CoV-2 infections in patients of Washington outpatient clinics and Seattle ED settings peaked in late March and have been declining.</p> <p>-> This trajectory is aligned with local physical distancing and the “Stay Home, Stay Healthy” order announced March 23, 2020.</p>
Nature structural & molecular biology 07MAY2020	Structural basis for the inhibition of SARS-CoV-2 main protease by antineoplastic drug carmofur	Jin, Zhenming et al. China gotopaper	Therapeutic	<p>The antineoplastic drug carmofur is shown to inhibit the SARS-CoV-2 main protease (M^{pro}). The X-ray crystal structure of M^{pro} in complex with carmofur reveals that the carbonyl reactive group of carmofur is covalently bound to catalytic Cys145, whereas its fatty acid tail occupies the hydrophobic S2 subsite. Carmofur inhibits viral replication in VeroE6 cells (EC50 = 24.30 μM). Carmofur has a favorable selectivity index (SI) of 5.36, but further optimization will be required to develop an effective drug.</p> <p>This study provides a basis for rational design of carmofur analogs with enhanced inhibitory efficacy to treat COVID-19.</p>
The Lancet Rheumatology 07MAY2020	Interleukin-1 blockade with high-dose anakinra in patients with COVID-19, acute respiratory distress syndrome, and hyperinflammation: a retrospective cohort study	Cavalli, Giulio et al. Italy gotopaper	Therapeutic	<p>Retrospective cohort study in adult patients with COVID-19, moderate-to-severe ARDS, and hyperinflammation, managed with non-invasive ventilation outside of the ICU and who received standard treatment of hydroxychloroquine and lopinavir-ritonavir, with or without anakinra.</p> <p>29 patients received high-dose intravenous anakinra, 16 patients comprised the comparison group for this study, and 7 patients received low-dose subcutaneous anakinra but treatment was interrupted after 7 days.</p> <p>At 21 days, treatment with high-dose anakinra was associated with clinical improvement in 21 (72%) of 29 patients versus 8 (50%) in the standard treatment group. At 21 days, survival was 90% in the high-dose anakinra group and 56% in the standard treatment group (p=0.009). Discontinuation of anakinra was not followed by inflammatory relapses.</p> <p>Limitations: retrospective nature, relatively small size of the cohorts (particularly the historical comparator group), a more extended follow-up is also needed to assess long-term outcomes of treated patients.</p>
Journal of Clinical Virology 07MAY2020	SARS-CoV-2 detection by direct rRT-PCR without RNA extraction	Merindol, Natacha, and al. gotopaper	Diagnostic	<p>There are many challenges associated with ramping up testing capacity, including shortage in the chain of supplies for extraction reagents. This situation called for alternatives protocols with similar sensitivity to ensure the continuity of testing in laboratories.</p> <p>-> Comparison of sensitivity of 2 approved rRT-QPCR Assays with and without RNA extraction.</p> <p>Conclusion : the two tests provided the same sensitivity. Direct rRT-PCR without RNA extraction is possible if samples are in UTM or molecular water; specimens collected in water should be screened rapidly. RNA extraction is necessary if samples are in saline water or Hanks medium.</p>

Journal and date	Title	Authors and link	Field of expertise	Key facts
JAMA 07MAY2020	Necessity of a development and widespread distribution of COVID-19 medical treatments	Bollyky, T. et al, US gotopaper	HSS/Politic	<p>1- Equitable Distribution Plan for manufacturing capacity, financing, and distribution infrastructure necessary to produce sufficient quantities to meet global needs in a fair, public health–driven manner.</p> <p>2- Framework for Distribution =>For flexible, trusted governance - take advantage of well-established international forums (e.g: G7) rather than build something new + central role of WHO in planning and coordinating the implementation of the framework - requires coordination of several institutions, donors, governments and pharmaceutical companies - COVID-19 access accelerator (ACT), recently launched and supported by the European Commission, should extend to other major contributors, members of the G20. - involve entities that develop vaccines, treatments and diagnostics and support group supply in LMICs (CEPI, Gavi, the Global Fund...)</p> <p>=> Adequate, Predictable Financing Provide a funding mechanism to generate income for R&D + deployment of vaccines and therapeutic products (advance purchase commitments (APC) for COVID-19 products + profiles of target products) Funds => mixture of national and philanthropic contributions, mobilized to raise additional funds on the capital markets Contribution from world leaders + subscription depending on payment capacity of countries. = low-income countries highly subsidized /free. Transparent regulatory pathway for approval of COVID-19 products → instill global confidence, reduce development costs and accelerate access to less profitable markets.</p>
The Lancet. Respiratory medicine 07MAY2020	Tropism, replication competence, and innate immune responses of the coronavirus SARS-CoV-2 in human respiratory tract and conjunctiva: an analysis in ex-vivo and in-vitro cultures	Hui, Kenrie P. Y.; et al. China gotopaper	Fundamental research	<p>SARS-CoV-2 tissue and cellular tropism in ex-vivo cultures of human bronchus, lung, conjunctiva, and innate immune responses vs other coronavirus and influenza virus (H1N1).</p> <p>SARS-CoV-2 isolated from COVID-19 patients: - infected ciliated, mucus-secreting, and club cells of bronchial epithelium, type 1 pneumocytes in the lung, and the conjunctival mucosa. - In bronchus : replication similar to MERS-CoV, and higher than SARS-CoV, but lower than H1N1. - In lung: replication similar to SARS-CoV and H1N1, but lower than MERS-CoV. - In conjunctiva: replication greater than SARS-CoV. - SARS-CoV-2 was a less potent inducer of proinflammatory cytokines than H5N1, H1N1pdm, or MERS-CoV.</p> <p>-> Conjunctival epithelium and conducting airways are potential portals of infection for SARS-CoV-2. SARS-CoV-2 replicated similarly to SARS-CoV in alveolar epithelium; but more extensively in bronchus.</p>
Cell 07MAY2020	Coast-to-Coast Spread of SARS-CoV-2 during the Early Epidemic in the United States	Fauver et al, USA gotopaper	Public Health/Epidemiology	<p>SARS-CoV-2 detected in all 50 states of USA. Data on sequencing of nine viral genomes from early reported COVID-19 patients, the majority of which from Washington State, combined with domestic and international travel patterns, showed:</p> <ul style="list-style-type: none"> - SARS-CoV-2 transmission in Connecticut was likely driven by domestic introductions - the risk of domestic importation to Connecticut exceeded that of international importation by mid-March regardless of our estimated effects of federal travel restrictions <p>→ Widespread transmission of SARS-CoV-2 within USA, need for critical surveillance</p>

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Infect. Control Hosp. Epidemiol. MAY2020	Effect of ambient air pollutants and meteorological variables on COVID-19 incidence	Jiang et al, China gotopaper	Public Health/Epidemiology	The multivariate Poisson regression used to analyse correlation between COVID-19 incidence, eight air pollutants and three meteorological variables in three China's worst COVID-19 hit provinces. Daily COVID-19 incidence was positively associated with PM2.5 and humidity in all cities. The relative risk (RR) of PM2.5 was 1.036 (95% CI, 1.032 -1.039), 1.059 (95% CI, 1.046 - 1.072) and 1.144 (95% CI, 1.12 - 1.169) for COVID-19 incidence per day in the three provinces. The RR of humidity was lower than that of PM2.5, difference ranging from 0.027 to 0.111. PM10 and temperature exhibited a negative correlation with daily COVID-19 incidence: the RR of PM10 ranged from 0.915 (95% CL, 0.896 - 0.934) to 0.961 (95% CL, 0.95 - 0.972) while that of temperature was 0.738 (95% CL, 0.717 - 0.759) to 0.969 (95% CL, 0.966 - 0.973). Data suggest that PM2.5/humidity and PM10/temperature could substantially increase and decrease the risk of COVID-19 incidence, respectively.
Nature 07MAY2020	The pathogenicity of SARS-CoV-2 in hACE2 transgenic mice	Bao, Linlin; et al. China gotopaper	Animal model	Human ACE2 transgenic mice infected with SARS-CoV-2 : - SARS-CoV-2 intranasal inoculation at 10 ⁵ TCID ₅₀ /50 µL inoculum volume per mouse. (14 days observation) - 6-11 month-old, male and female WT (n=15) and hACE2 mice (n=19). - Typical histopathology: interstitial pneumonia with infiltration of significant macrophages and lymphocytes into the alveolar interstitium, and accumulation of macrophages in alveolar cavities. - Weight loss observed in hACE2 mice (up to 8% at 5 dpi), not in WT mice. - viral load detectable (qRT-PCR) at 1, 3, 5 and 7 dpi (peak at 3 dpi) in lungs of hACE2 mice but not in WT mice. - infectious virus isolated from lungs of hACE2 mice at 1, 3 dpi and 5 dpi (peak titers at 3 dpi), but not WT mice. - Viral antigens detected in bronchial epithelial cells, macrophages and alveolar epithelia. -> Confirmed pathogenicity of SARS-CoV-2 in hACE2 expressing mice and suggests that hACE2 was essential for infection and replication in mice.
The Journal of Infectious Diseases 07MAY2020	T cell subset counts in peripheral blood can be used as discriminatory biomarkers for diagnosis and severity prediction of COVID-19	Jiang, Mei and al. China gotopaper	Diagnostic	Assessment of the significance of lymphocyte subsets detection in peripheral blood in the diagnosis and prognosis of Covid-19 disease. The counts of CD8+T and CD4+T cells can be used as diagnostic markers of COVID-19 and predictors of disease severity.
The Lancet Psychiatry 07MAY2020	COVID-19, unemployment, and suicide	<i>Kawohl</i> And Nordt., Switzerland gotopaper	Psy	High scenario: the worldwide unemployment rate would increase from 4-936% to 5-644%, which would be associated with an increase in suicides of about 9570 per year. Low scenario: the unemployment would increase to 5-088%, associated with an increase of about 2135 suicides.
New England Journal of Medicine 07MAY2020	Observational Study of Hydroxychloroquine in Hospitalized Patients with Covid-19	Geleris, Joshua et al. USA gotopaper	Therapeutic	Observational study involving consecutive patients with Covid-19 admitted to a hospital, and comparing outcomes in patients who received hydroxychloroquine with those in patients who did not. The primary end point was a composite of intubation or death in a time-to-event analysis. Of the 1376 patients , 811 (58.9%) received hydroxychloroquine and 565 (41.1%) did not. Hydroxychloroquine-treated patients were more severely ill at baseline than those who did not receive hydroxychloroquine. Overall, 346 patients (25.1%) had a primary end-point of respiratory failure. In the main analysis, there was no significant association between hydroxychloroquine use and intubation or death (hazard ratio, 1.04, 95% confidence interval, 0.82 to 1.32). Results were similar in multiple sensitivity analyses.

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Nat Rev Immunology 06MAY2020	Pathological inflammation in patients with COVID-19: a key role for monocytes and macrophages	Merad et al., USA gotopaper	Immuno	<p>The delay in production of type I interferon promotes the enhanced release of monocyte chemoattractants by alveolar epithelial cells leading to sustained recruitment of blood monocytes into the lungs.</p> <ul style="list-style-type: none"> · Monocytes differentiate into pro-inflammatory macrophages · Activated natural killer (NK) cells and T cells further promote the recruitment and activation of monocyte-derived macrophages through the production of granulocyte–macrophage colony-stimulating factor (GM-CSF), tumour necrosis factor (TNF) and interferon-γ (IFNγ). · Oxidized phospholipids (OxPLs) are accumulated in infected lungs and activate monocyte-derived macrophages through the Toll-like receptor 4 (TLR4)–TRAF6–NF-κB pathway. · It is possible that type I interferons induce the expression of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) entry receptors, enabling the virus to gain access to the cytoplasm of macrophages and to activate the NLRP3 inflammasome, leading to the secretion of mature IL-1β and/or IL-18. · IL-1β can amplify activation of monocyte-derived macrophages in an autocrine or paracrine way, but it can also reduce type I interferon production in infected lungs. · The engagement of Fcγ receptors (FcγR) by anti-spike protein IgG immune complexes can contribute to increased inflammatory activation of monocyte-derived macrophages. <p>Conclusion: Identifying the mechanisms that contribute to reduced type I interferon activity will be critical for the development of targeted immunomodulatory strategies in patients with COVID-19</p>
Antimicrobial agents and chemotherapy 06MAY2020	Inhibition of SARS-CoV-2 infection by the cyclophilin inhibitor Alisporivir (Debio 025)	Softic, Lauren et al. France, gotopaper	Therapeutic	<p>Cyclophilins play a key role in the lifecycle of coronaviruses. Alisporivir (Debio 025) is a non-immunosuppressive analogue of cyclosporin A with potent cyclophilin inhibition properties. It has been administered to more than 1,800 patients with chronic hepatitis C virus infection in Phase 2 and 3 clinical trials, alone or in combination with pegylated interferon alpha and/or ribavirin.</p> <p>=> Alisporivir reduced SARS-CoV-2 RNA production in a dose-dependent manner in VeroE6 cell line, with an EC50 of 0.46\pm0.04 μM.</p> <p>=> Anti-SARS-CoV-2 effectiveness of alisporivir was confirmed by immunofluorescence.</p> <p>=> Alisporivir did not inhibit SARS-CoV-2 entry into VeroE6 cells. Effect of alisporivir was preserved when the compound was added 3 h post-infection. These results suggest that alisporivir inhibits a post-entry step of the SARS-CoV-2 life cycle.</p>
Journal of the American College of Cardiology 06MAY2020	Association of Treatment Dose Anticoagulation with In-Hospital Survival Among Hospitalized Patients with COVID-19	Paranjpe, Ishan et al. USA gotopaper	Therapeutic	<p>Association between administration of in-hospital anticoagulation (AC) and survival in a large cohort of 2,773 hospitalized patients with COVID-19, among which 786 (28%) received systemic AC during their hospital course.</p> <p>=> Systemic AC may be associated with improved outcomes among patients hospitalized with COVID-19. Potential benefits of systemic AC need to be weighed against the risk of bleeding and therefore should be individualized. The association of in-hospital AC and mechanical ventilation likely reflects reservation of AC for more severe clinical presentations.</p> <p>=> Association with AC and improved survival after adjusting for mechanical ventilation.</p> <p>Limitations: observational study, unobserved confounding, unknown indication for AC, lack of metrics to further classify illness severity in the mechanically ventilated subgroup, and indication bias.</p>

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BMC 06MAY2020	A single-center, retrospective study of COVID-19 features in children: a descriptive investigation	Ma H, and al China gotopaper	Clinic	<p>50 children COVID19+ and 26 with PCR- and CT+ with history of exposure</p> <p>Symptoms:</p> <ul style="list-style-type: none"> - More frequent: fever (64%) – cough (44%) - Less frequent: diarrhea (6%) – abdominal pain (4%) – rhinorrhea (16%) - Asymptomatic 12% <p>Laboratory:</p> <ul style="list-style-type: none"> - Lymphopenia (16%) – thrombocytopenia (14%) - Elevated CRP (20%) – anemia (12%) <p>43/50 had abnormalities on CT: - Ground glass opacity (64%) 29/50 >1 CT which 65% had improved CT and 28% had more lesions</p> <p>At discharge: no association between changes in CT lesions →CT allow to detect COVID19 but do not evaluated the resolution of illness for children</p>
Cell host & microbe PREPRINT	Identification of human single-domain antibodies against SARS-CoV-2	Yanling Wu et al, China gotopaper	Therapeutic	<p>SARS-CoV-2 spike protein, containing the receptor-binding domain (RBD) and S1 subunit involved in receptor engagement, is a potential therapeutic target.</p> <ul style="list-style-type: none"> - Development of a phage-displayed single-domain antibody library by grafting naïve complementarity-determining regions (CDRs) into framework regions of a human germline immunoglobulin heavy chain variable region (IGHV) allele. - Panning this library against SARS-CoV-2 RBD and S1 subunit identified fully human single-domain antibodies targeting five distinct epitopes on SARS-CoV-2 RBD with subnanomolar to low nanomolar affinities. Some of these antibodies neutralize SARS-CoV-2 by targeting a cryptic epitope located in the spike trimeric interface.
SCIENCE 06MAY2020	Development of an inactivated vaccine candidate for SARS-CoV-2	Qiandg Gao et al, China gotopaper	Vaccine	<p>Development of PiCoVacc Vaccine based on the inactivated SARS-CoV-2 virus (Sinovac vaccine currently in ph1) -> Isolation of 11 SARS-CoV-2 strains COVID19 patients BALF (China, Italy, Switzerland, UK, and Spain) to developed preclinical in vitro neutralization and challenge models. A strain from a Chinese patient inactivated with b-propionolactone was used for vaccine development (not causing severe disease).</p> <p>Immunogenicity in BAL/C mice: -> Inactivated Chinese patient virus+adjuvant (PiCoVacc) was injected at day 0 and 7 at different doses (0ug, 1,5ug, 3ug, 6ug) -> SARS-CoV-2 S and RBD specific IgGs were developed very quickly in mice sera ->The dominant immunogen was shown to be the RBD (no response to N protein) ->Neutralizing antibodies against all the SARS-CoV-2strains were also produced</p> <p>Immunogenicity and protection in macaques -> 3 immunizations at d 0, 7 and 14 with at different doses of PiCoVacc (3 or 6ug) -> Specific S IgG and neutralizing antibodies were induced from two weeks after vaccination -> macaques at day 22 after fist immunization: viral loads were shown to decrease. -> No detectable viral load in pharynx, crissum and lung in high dose vaccinated monkeys from 7 d after challenge. no changes on serological markers (CD3+, CD4+ CD88+, TNF-a, IFN-g, IL2, IL4...) nor pathologies in heart, spleen kidney or lung were observed suggesting that PiCoVacc do not induce exacerbated T cell response nor organ pathology.</p>

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Pediatr Infect Dis J 6MAY2020	The risk of children Hospitalized with severe COVID-19 in Wuhan	Wang Y and al China https://doi.org/10.1097/INF.0000000000002739	Clinic	<p>Retrospective case-control study – 8 severe children matched with 35 - Median age of severe cases: 5,06 years 2/8 had comorbidities</p> <p><u>Symptoms in both groups:</u> fever – cough – dyspnea – diarrhea/vomiting</p> <p><u>Laboratory:</u> -WBC higher in severe group -No difference for lymphocytes counts $p>0,05$ -IL6 – IL10, D-dimer higher in severe group Hospital stay: 13,5 (severe) versus 11 days (non severe) Time for PCR turning negative: 10,5 (severe) versus 7,1 ($p<0,05$)</p> <p>More lung segment involves in severe children → unique risk factor for severe</p> <p>→ mild symptomatic (8 severe cases on 260 COVID-19) – rare mortality → some factors associated with severity: CT scan lesions – immune response (IL-6) – intravascular coragulation (D-dimer)</p>
Science 05MAY2020	Rapid implementation of mobile technology for real-time epidemiology of COVID-19	Drew et al, USA https://doi.org/10.1126/science.abc0473	Public Health/Epidemiology	<p>The Coronavirus Pandemic Epidemiology (COPE) consortium developed a Symptom Tracker mobile application, launched in the UK on March 24, 2020 and the US on March 29, 2020 garnering more than 2.8 million users as of May 2, 2020.</p> <p>This mobile application offers data on risk factors, herald symptoms, clinical outcomes, and geographical hot spots.</p> <p>This initiative offers critical proof-of-concept for the repurposing of existing approaches to enable rapidly scalable epidemiologic data collection and analysis which is critical for a data-driven response to this public health challenge.</p> <p>Retrospective study based on a large healthcare computerized database including all patients that were screened for the SARS-CoV-2 in the study period from February 23rd 2020 to March 31st 2020.</p> <p>Comparison between subjects tested positive for SARS-CoV-2 and those found negative in terms of rate of administration of hydroxychloroquine/ colchicine therapy.</p> <ul style="list-style-type: none"> - An overall sample of 14,520 subjects were screened for SARS-CoV-2 infection and 1317 resulted positive. - No significant difference was found in terms of rates of usage of hydroxychloroquine or colchicine between those who were found positive for SARS-CoV-2 and those who were found negative (0.23% versus 0.25% for hydroxychloroquine, and 0.53% versus 0.48% for colchicine, respectively).
Autoimmunity reviews 05MAY2020	Continuous hydroxychloroquine or colchicine therapy does not prevent infection with SARS-CoV-2: Insights from a large healthcare database analysis	Gendelman, Omer et al, Israel https://doi.org/10.1016/j.lautrev.2020.102566	Therapeutic	<p>Isolation of single-domain antibodies (VHHs) from a llama immunized with prefusion-stabilized coronavirus spikes.</p> <p>These VHHs neutralize MERS-CoV or SARS-CoV-1 S pseudotyped viruses, respectively. Crystal structures of these VHHs bound to their respective viral targets reveal two distinct epitopes, but both VHHs interfere with receptor binding. Cross-reactivity between the SARS-CoV-1 S-directed VHH and SARS-CoV-2 S.</p> <p>Cross-reactive VHH neutralizes SARS-CoV-2 S pseudotyped viruses as a bivalent human IgG Fc-fusion.</p> <p>=> These data provide a molecular basis for the neutralization of pathogenic betacoronaviruses by VHHs and suggest that these molecules may serve as useful therapeutics during coronavirus outbreaks.</p>
Cell 05MAY2020	Structural Basis for Potent Neutralization of Betacoronaviruses by Single-domain Camelid Antibodies	Daniel Wrapp and al, https://doi.org/10.1016/j.cell.2020.04.031	Therapeutic	<p>Isolation of single-domain antibodies (VHHs) from a llama immunized with prefusion-stabilized coronavirus spikes.</p> <p>These VHHs neutralize MERS-CoV or SARS-CoV-1 S pseudotyped viruses, respectively. Crystal structures of these VHHs bound to their respective viral targets reveal two distinct epitopes, but both VHHs interfere with receptor binding. Cross-reactivity between the SARS-CoV-1 S-directed VHH and SARS-CoV-2 S.</p> <p>Cross-reactive VHH neutralizes SARS-CoV-2 S pseudotyped viruses as a bivalent human IgG Fc-fusion.</p> <p>=> These data provide a molecular basis for the neutralization of pathogenic betacoronaviruses by VHHs and suggest that these molecules may serve as useful therapeutics during coronavirus outbreaks.</p>

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Nature Communications 04MAY2020	A human monoclonal antibody blocking SARS-CoV-2 infection	Wang, Chunyan et al, https://www.nature.com/articles/s41467-020-16256-y	Therapeutic	First report of a (human) monoclonal antibody that neutralizes SARS-CoV-2 (and SARS-CoV) in cell culture. 47D11 binds a conserved epitope on the spike RBD explaining its ability to cross-neutralize SARS-CoV and SARS-CoV-2, using a mechanism that is independent of receptor-binding inhibition.
Intensive Care Med 04MAY2020	High risk of thrombosis in patients with severe SARS-CoV-2 infection: a multicenter prospective cohort study	Helms J, and al France https://doi.org/10.1007/s00134-020-06062-x	Clinic	Multicentric study – 4 ICU in France – 150 patients with ARDS Historical prospective cohort → comparison of COVID to non-COVID by propensity score matching At baseline: >95% patients elevated had D-dimer and fibrinogen Median age = 63 years 64/150 thrombotic complications and 16,7% pulmonary embolisms COVID19 (=77) vs non-COVID19 (=145): - More thrombotic complication in COVID19 (11,7 vs 2,1%, $p<0,008$) Thrombotic complications despite prophylactic or therapeutic anticoagulation → large number of patients still intubated → under-estimated → monitoring anticoagulant treatment/ higher targets than usual?
Nature 04MAY2020	Effect of non-pharmaceutical interventions to contain COVID-19 in China	Lai, Shengjie et al, https://www.nature.com/articles/s41586-020-2293-x	Public Health/Epidemiology	Modelling framework that uses daily travel networks to simulate different outbreak and intervention scenarios across China , using epidemiological and anonymised human movement data. -> Total of 114,325 COVID-19 cases (interquartile range 76,776 - 164,576) estimated in mainland China as of February 29, 2020. -> Without non-pharmaceutical interventions (NPIs), the COVID-19 cases would likely have shown a 67-fold increase (interquartile range 44 - 94) by February 29, 2020, with the effectiveness of different interventions varying. -> The early detection and isolation of cases was estimated to have prevented more infections than travel restrictions and contact reductions, but combined NPIs achieved the strongest and most rapid effect. -> The lifting of travel restrictions since February 17, 2020 does not appear to lead to an increase in cases across China if the social distancing interventions can be maintained, even at a limited level of 25% reduction on average through late April.
Cell host & microbe 04MAY2020	Heightened innate immune responses in the respiratory tract of COVID-19 patients	Zhou, Zhuo; et al. China https://doi.org/10.1016/j.chom.2020.04.017	Immunology	Metatranscriptomic seq. to profile immune signatures in bronchoalveolar lavage fluid of 8 COVID-19, 146 community-acquired pneumonia patients, and 20 healthy controls : - Proinflammatory gene expression, especially chemokines, markedly elevated in COVID-19 vs community-acquired pneumonia patients and healthy controls, suggesting SARS-CoV-2 causes hypercytokinemia. - SARS-CoV-2 triggered robust expression of IFN-inducible genes (ISGs) with immunopathogenic potential (overrepresentation of genes involved in inflammation), unlike SARS-CoV which is thought to induce inadequate IFN. - Estimations of immune cell populations, show increased activated dendritic cells and neutrophils.
Science 04MAY2020	Site-specific glycan analysis of the SARS-CoV-2 spike	Watanabe, Yasunori, et al. UK - USA https://doi.org/10.1126/science.abb9983	Structural biology	Revealing the glycan structures on a recombinant SARS-CoV-2 spike (S) glycoprotein immunogen by site-specific mass spectrometry. -SARS-CoV-2 S gene encodes 22 N-linked glycan sequons per protomer, which likely play a role in protein folding and immune evasion. -> Glycosylation analysis enables detailed mapping of the glycan-processing states and signatures across the trimeric viral spike. Glycan profiling have implications in viral pathobiology as well as vaccine design for comparing immunogen integrity and monitoring manufacturing processes .

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Nature 04MAY2020	Rapid reconstruction of SARS-CoV-2 using a synthetic genomics platform	Thao, Tran Thi Nhu, et al. Switzerland - Germany - Russia https://www.nature.com/articles/s41586-020-2294-9	Fundamental research	<p>Accelerated yeast-based reverse genetics pipeline can genetically reconstruct diverse long RNA viruses, including Coronaviridae, Flaviviridae and Paramyxoviridae families :</p> <ul style="list-style-type: none"> - Viral subgenomic fragments (from viral isolates, cloned viral DNA, clinical samples, or synthetic DNA) are reassembled in one step in <i>S. cerevisiae</i> using transformation associated recombination (TAR) cloning to maintain the genome as a yeast artificial chromosome (YAC). T7-RNA polymerase then used to generate infectious RNA and viable virus. <p>-> Approach to generate SARS-CoV-2 is rapid (1 week after receipt of synthetic DNA fragments) and applicable to other emerging RNA viruses, and can provide infectious virus to health authorities and diagnostic labs without the need of access to clinical samples.</p> <p>- Also possible to rapidly introduce sequence variations to functionally characterize phenotypic consequences of SARS-CoV-2 evolution in real-time.</p>
Autoimmunity reviews 03MAY2020	Tocilizumab for the treatment of severe COVID-19 pneumonia with hyperinflammatory syndrome and acute respiratory failure: A single center study of 100 patients in Brescia, Italy	Toniati, Paola et al, Italy https://doi.org/10.1016/j.autrev.2020.102568	Therapeutic	<p>A prospective series of 100 consecutive patients admitted to a Hospital in Brescia (Italy) between March 9th and March 20th with confirmed COVID-19 pneumonia and ARDS requiring ventilatory support were administered Tocilizumab (TCZ, monoclonal antibody that targets the interleukin 6 receptor).</p> <p>The outcome measure was an improvement in ARDS assessed by means of the Brescia COVID Respiratory Severity Score.</p> <p>Out of 100 treated patients (88 M, 12 F; median age: 62 years), the respiratory condition was improved or stabilized in 77 (77%) patients, of whom 61 showed a significant clearing of diffuse bilateral opacities on chest x-ray and 15 were discharged from the hospital. Respiratory condition worsened in 23 (23%) patients, of whom 20 (20%) died.</p> <p>All the patients presented with lymphopenia and high levels of C-reactive protein (CRP), fibrinogen, ferritin and interleukin 6 (IL-6) indicating a HIS. During the 10-day follow-up, three cases of severe adverse events were recorded.</p>
Immunity 03MAY2020	Detection of SARS-CoV-2-specific humoral and cellular immunity in COVID-19 convalescent individuals	Ling et al., China https://www.sciencedirect.com/science/article/pii/S1074761320301813	Diagnostic	<ol style="list-style-type: none"> 1. SARS-CoV-2-specific antibodies are detected in COVID-19 convalescent subjects. 2. Most COVID-19 convalescent individuals have detectable neutralizing antibodies. 3. Cellular immune responses to SARS-CoV-2 are found in COVID-19 convalescent subjects 4. Neutralization antibody titers correlate with the numbers of virus-specific T cells.
American journal of obstetrics and gynecology 03MAY2020	Evidence for and against vertical transmission for SARS-CoV-2 (COVID-19)	A, Amouroux; et al. France http://www.sciencedirect.com/science/article/pii/S000293782030524X	Clinic	<p>Observations from 12 articles published from 10 February to 4 April 2020 reporting on 68 deliveries and 71 neonates with maternal infection in the third trimester of pregnancy:</p> <ul style="list-style-type: none"> - SARS-CoV-2 recovered (RT-PCR) from nasal and throat swabs, sputum and feces of symptomatic patients including neonates but not from vaginal swabs, amniotic fluid, placenta, cord blood, neonatal blood or breast milk. - Neonatal infection was diagnosed within 48 hours of life in 4 cases. <p>-> More complete evidence and reliable serological studies needed before counselling pregnant women on the risk of congenital infection with SARS-CoV-2.</p>

Journal and date	Title	Authors and link	Field of expertise	Key facts
Int. J. Infect. Dis. 03MAY2020	Viral kinetics of SARS-CoV-2 in asymptomatic carriers and presymptomatic patients	Kim, Seong Eun; et al. South Korea https://doi.org/10.1016/j.ijid.2020.04.083	Virology	71 laboratory-confirmed SARS-CoV-2 cases, identified 3 presymptomatic patients and 10 entirely asymptomatic infections: - 2 out of 3 incubation period patients (presymptomatic) had very high viral titer (Ct value <20). - In entirely asymptomatic carriers : median days to first negative RT-PCR was 4.5 (2.5–9) days and all reached a first Ct>35 RT-PCR within 14 days after diagnosis. -> COVID-19 patients may already be infectious before symptoms manifestation, and 14 days isolation after diagnosis may be sufficient in entirely asymptomatic cases.
Gastroenterology 01MAY2020	Gastrointestinal and Hepatic Manifestations of 2019 Novel Coronavirus Disease in a Large Cohort of Infected Patients From New York: Clinical Implications	Kaveh H and al USA https://doi.org/10.1053/j.gastro.2020.05.010	Clinic	1059 patients COVID-19 - 33% at least one gastrointestinal symptom GI symptom: diarrhea (22%) – abdominal pain (7%) – nausea (16%) 62% had biochemical liver injury GI manifestation and liver injury were associated with higher admission rate Multivariate analysis → independent predictor of death or ICU admission - Liver injury at presentation OR:2,53 - Older age OR:1,03 - Tachypnea OR:1,73 - Severe hypoxemia OR:1,47 GI manifestation → no effect on the outcome → COVID-19 patients had commonly GI manifestation Cohort study of hospitalized patients with coronavirus disease 2019.
JAMA Cardiology 01MAY2020	Risk of QT Interval Prolongation Associated With Use of Hydroxychloroquine With or Without Concomitant Azithromycin Among Hospitalized Patients Testing Positive for Coronavirus Disease 2019 (COVID-19)	Mercurio, Nicholas J. Et al, USA https://jamanetwork.com/journals/jamacardiology/fullarticle/2765631	Therapeutic	Among 90 patients given hydroxychloroquine, 53 received concomitant azithromycin. Those receiving concomitant azithromycin had a greater median change in QT interval compared with those receiving hydroxychloroquine. Seven patients (19%) who received hydroxychloroquine monotherapy developed prolonged QTc of 500 milliseconds or more, and 3 patients (3%) had a change in QTc of 60 milliseconds or more. Of those who received concomitant azithromycin, 11 of 53 (21%) had prolonged QTc of 500 milliseconds or more and 7 of 53 (13 %) had a change in QTc of 60 milliseconds or more. Ten patients had hydroxychloroquine discontinued early because of potential adverse drug events, including intractable nausea, hypoglycemia, and 1 case of torsades de pointes.
Molecular Cell 01MAY2020	A Multibasic Cleavage Site in the Spike Protein of SARS-CoV-2 Is Essential for Infection of Human Lung Cells	Hoffmann, Markus; et al. Germany https://doi.org/10.1016/j.molcel.2020.04.022	Fundamental research	The spike protein of SARS-CoV-2 harbors a multiple arginine residues (multibasic) S1/S2 site. - The host cell protease furin cleaves the SARS-CoV-2 spike protein at the S1/S2 site. - Cleavage at the S1/S2 site is essential for spike-driven cell-cell fusion and viral entry into lung cells. -> Suggests that acquisition of a S1/S2 multibasic cleavage site was essential for SARS-CoV-2 infection of humans and identify furin as a potential target for therapeutic intervention.
New England Journal of Medicine 01MAY2020	Cardiovascular Disease, Drug Therapy, and Mortality in Covid-19	Mehra M, and al USA https://doi.org/10.1056/NEJMea2007621	Clinic	RETRACTED

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New England Journal of Medicine 01MAY2020	Early Detection of Covid-19 through a Citywide Pandemic Surveillance Platform	Chu, Helen Y. and al. USA https://www.nejm.org/doi/full/10.1056/NEJMc2008646	Public Health/Epidemiology	<p>The Seattle Flu Study is a multi-institutional, community-wide pandemic surveillance platform that was established in November 2018.</p> <p>-> Persons enrolled online and were sent kits, by rapid-delivery services, for home collection of a midnasal swab; samples were returned by mail.</p> <p>->Persons reporting symptoms of respiratory illness provided informed consent for testing to identify influenza and other respiratory pathogens.</p> <p>->The first Covid-19 case detected through the Seattle Flu Study, in a specimen collected on February 24, 2020, was the first documented U.S. case of community transmission at the time.</p> <p>Conclusion: widespread implementation of simple methods that are scalable and require minimal interaction for collection of samples from persons who may not seek clinical care is critical for early detection of community cases. An ubiquitous, community-based sampling for respiratory illnesses appears as an essential infrastructure for early detection and mitigation of future pandemics</p>
Clin. Infect. Dis 01MAY2020	Early detection of SARS-CoV-2 antibodies in COVID-19 patients as a serologic marker of infection	Zhao, Rongqing and al. https://doi.org/10.1093/cid/ciaa523	Diagnostic	<p>A COVID-19/SARS-CoV-2 S1 serology ELISA kit was developed. The overall accuracy rate reached 97.3%. The assay was able to detect SARS-CoV-2 antibody on day one after the onset of COVID-19 disease. SARS-CoV-2 antibodies were detected in 28 out of 276 asymptomatic medical staff and one out of five nucleic acid test-negative “Close contacts” of COVID-19 patient.</p> <p>Conclusion: the assays developed here can screen medical staff, in-coming patients, passengers and people who are in close contact with the confirmed patients to identify the “innocent viral spreaders”, protect the medical staff and stop the further spreading of the virus.</p>
J. Clin. Virol. 01MAY2020	A RT-PCR Assay for the Detection of Coronaviruses from Four Genera	Xiu, Leshan and al. China https://www.sciencedirect.com/science/article/pii/S1386653220301335	Diagnostic	<p>A better understanding of the natural hosts and genetic diversity of CoVs are needed to help mitigate these threats.</p> <p>Objective: to design and evaluate a molecular diagnostic tool for detection and identification of all currently recognized and potentially future emergent CoVs from the Orthocoronavirinae subfamily.</p> <p>Conclusion: a semi-nested, reverse transcription RT-PCR assay capable of detecting and identifying all previously recognized CoVs, including SARS-CoV-2, and potentially any emergent CoVs in this subfamily.</p>
Science 01MAY2020	SARS-CoV-2 productively infects human gut enterocytes	Lamers, Mart M.; et al. Netherlands https://doi.org/10.1126/science.abc1669	Fundamental research	<p>Infection of human small intestinal organoids (hSIOs) grown from primary gut epithelial stem cells to investigate intestine as another viral target organ :</p> <ul style="list-style-type: none"> - hSIOs enterocytes were readily infected by SARS-CoV and SARS-CoV-2 (confocal- and electron-microscopy) and significant titers of infectious viral particles detected. - SARS-CoV-2 infected airway and gut organoids. - mRNA expression analysis revealed strong induction of a generic viral response program. SARS-CoV-2 induced a stronger interferon response than SARS-CoV in HIOs. <p>-> intestinal epithelium supports SARS-CoV-2 replication, and data imply that human organoids represent faithful experimental models to study of coronavirus infection and biology.</p>

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Emerging Microbes & Infections 01MAY2020	Kinetics of SARS-CoV-2 specific IgM and IgG responses in COVID-19 patients	Sun et al., China https://www.tandfonline.com/doi/full/10.1080/22221751.2020.1762515#	Immuno	<ul style="list-style-type: none"> Kinetic steps: - A total of 130 blood samples from 38 COVID-19 patients were analyzed. - Study showed that the seropositive rates of N-IgM, N-IgG, S-IgM and S-IgG antibody responses in non-ICU (intensive care unit) patients gradually increased within 1-3 weeks after the onset. - N-IgM and S-IgM reached a peak in the second week, while N-IgG and S-IgG antibodies continued to increase in the third week. - The joint detection of N-IgM, N-IgG, S-IgM, and S-IgG antibodies, could detect up to 75% of infections in the first week and the joint detection of N-IgM+N-IgG, or N-IgG+S-IgG could detect up to 94.7% of infections in the second week. Finally, in the third weeks after symptom onset, seropositive rates for N-IgG and S-IgG reached 100%. Comparison between ICU and non-ICU patients - Most ICU patients had higher N-IgG than S-IgG after the symptom onset - ICU patients had SARS-CoV-2 nucleic acid positive days of 31.0, whereas non-ICU patients had SARS-CoV-2 nucleic acid positive days of 13. Therefore, a continuous increase of N-IgG may indicate disease progression towards more severe illness. - S-IgG in ICU patients was significantly lower than non-ICU patients by 2 weeks after the onset Conclusion: Intensive care unit monitoring the kinetics of S-IgG should help to predict prognosis.
Science 01MAY2020	Structural basis for inhibition of the RNA-dependent RNA polymerase from SARS-CoV-2 by remdesivir	Yin, Wanchao; et al. China https://doi.org/10.1126/science.abc1560	Structural biology	<p>Cryo-EM structure of the SARS-CoV-2 RNA-dependent RNA polymerase (RdRp) in the apo form (unbound) (2.8 Å) or in complex with a 50-base template-primer RNA and the active form of Remdesivir (2.5 Å).</p> <ul style="list-style-type: none"> - Structure comparison and sequence alignment suggest that mode of substrate RNA recognition and Remdesivir inhibition of RdRp is highly conserved in diverse RNA viruses -> providing a basis for designing broad spectrum antiviral drugs based on nucleotide analogs and a template structure for modeling/modifying existing nucleotide drugs (ex. EIDD-2801). -> Complex structure reveals the partial double-stranded RNA template is inserted into the central channel of the RdRp where Remdesivir is covalently incorporated into the primer strand at the first replicated base pair and terminates chain elongation.
Gastroenterology 01MAY2020	Taste Changes (Dysgeusia) in COVID-19: A systematic review and metaanalysis	Aziz, Muhammad; et al. USA https://doi.org/10.1053/j.gastro.2020.05.003	Clinic	<p>Systematic review (case series/case-control/ cohort studies) (January 1st - April 21st, 2020) reporting on ageusia/dysgeusia:</p> <ul style="list-style-type: none"> - 4 single-nation studies, 1 multinational study from Europe = total of 817 patients included. -> Prevalence : almost half of patients (49.8%) with COVID-19 have altered taste sensation across the five studies. Limitations : lack of data comparing ageusia/dysgeusia in COVID-19 +ve vs -ve patients, or severe COVID-19. In contexts of lack of diagnostic tests (ex. developing world), distinctive clinical features like ageusia/dysgeusia can be useful in identifying suspected COVID-19 patients.
New England Journal of Medicine 01MAY2020	Renin–Angiotensin–Aldosterone System Inhibitors and Risk of Covid-19	Reynolds H, and al USA https://doi.org/10.1056/NEJMoa2008975	Clinic	<p>Relation between previous treatment that act on the RAAS and the likelihood of a positive test or the likelihood of severe illness?</p> <p>Five class of antihypertensive medication examined. Estimated a propensity score for the likelihood of treatment with each medication class</p> <ul style="list-style-type: none"> -> 12594 patients were tested -> 5894 patients positive COVID19 which 17% had severe illness -> 2573/(5894) had HTA which 24,6% had severe illness <p>No association between medication examined and increased likelihood of a positive test or in the risk of severe Covid19.</p>

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NEJM 01MAY2020	Inhibitors of the Renin–Angiotensin–Aldosterone System and Covid-19	Jarcho, John A.; et al. USA https://doi.org/10.1056/NEJMe2012924 Mehra MR, et al. USA https://doi.org/10.1056/NEJMoa2007621 Mancia, Giuseppe; et al. Italy https://doi.org/10.1056/NEJMoa2006923 Reynolds HR, et al. USA https://doi.org/10.1056/NEJMoa2008975	Clinic	<p>Analysis of 3 <i>N Engl J Med</i> articles, as clinicians weigh alleged harm of continuing RAAS inhibitor medications (like ACE inhibitors and angiotensin-receptor blockers (ARBs)) often prescribed to patient with hypertension, diabetes, and coronary artery disease (high risk groups for severe COVID-19):</p> <ul style="list-style-type: none"> - Mehra et al. database study, 8910 hospitalised Covid-19 patients, 11 countries : ACE inhibitors nor ARBs associated with increased risk in-hospital death. Secondary analysis restricted to hypertension patients (for whom ACE inhibitor or ARB would be indicated) also did not show harm. - Mancia et al. case–control study, 6272 confirmed SARS-CoV-2 patients in Lombardy (Italy) vs 30,759 matched controls : ACE inhibitors nor ARBs associated with likelihood of SARS-CoV-2 infection. In severe/fatal infections vs matched controls, no association between these drugs and severe Covid-19. - Reynolds et al. electronic health records, 12,594 people in New York University -> 5894 tested +ve, of which 1002 had severe illness (admission to ICU/mechanical ventilation/death): no +ve association for drug classes, ACE inhibitors and ARBs, for a +ve test result or severe illness. <p>-> none of the 3 studies showed evidence of harm with continued use of ACE inhibitors and ARBs.</p>
JAMA Cardiology 30APR2020	Assessment of QT Intervals in a Case Series of Patients With Coronavirus Disease 2019 (COVID-19) Infection Treated With Hydroxychloroquine Alone or in Combination With Azithromycin in an Intensive Care Unit	Bessiere, Francis et al, France https://jamanetwork.com/journals/jamacardiology/fullarticle/2765633	Therapeutic	<p>40 consecutive patients with COVID-19 confirmed by positive RT-PCR results on respiratory samples admitted to the ICU who received hydroxychloroquine with or without were included.</p> <ul style="list-style-type: none"> -> 30 patients (75%) required invasive mechanical ventilation and 25 (63%) received vasoactive drugs. -> Hydroxychloroquine with or without azithromycin was given to 18 (45%) and 22 patients (55%), respectively. 20 patients (50%) also received other treatments favoring QT prolongation in the ICU. ⇒ Most patients (37 [93%]): increase in QTc. Prolonged QTc was observed in 14 patients (36%) after a duration of antiviral treatment of 2 to 5 days. No ventricular arrhythmia, including torsades de pointes. ⇒ Among patients treated with hydroxychloroquine and azithromycin, 6 of 18 (33%) developed an increase in QTc of 500 milliseconds or greater vs 1 of 22 (5%) of those treated with hydroxychloroquine alone (P = .03). ⇒ The antiviral treatment ceased before completion for 7 patients (17.5%) following ECG abnormalities and in 10 (25%) for acute renal failure.
Nature 30APR2020	A SARS-CoV-2 protein interaction map reveals targets for drug repurposing	Gordon, David E et al, https://www.nature.com/articles/s41586-020-2286-9#Abs1	Therapeutic	<p>26 of the 29 SARS-CoV-2 proteins in human cells were cloned, tagged and expressed, and the human proteins physically associated with each were identified using affinity-purification mass spectrometry (AP-MS)</p> <ul style="list-style-type: none"> -> Identification of 332 high-confidence SARS-CoV-2-human protein-protein interactions (PPIs). -> Among these, 66 druggable human proteins or host factors targeted by 69 compounds (29 FDA-approved drugs, 12 drugs in clinical trials, and 28 preclinical compounds). -> Screening a subset of these in multiple viral assays identified two sets of pharmacological agents that displayed antiviral activity: inhibitors of mRNA translation and predicted regulators of the Sigma1 and Sigma2 receptors. <p>Further studies of these host factor targeting agents, including their combination with drugs that directly target viral enzymes, could lead to a therapeutic regimen to treat COVID-19.</p>

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Jama Psychiatry 30APR2020	Mental Health in the Coronavirus Disease 2019 Emergency—The Italian Response	De Girolamo et al., Italy https://jamanetwork.com/journals/jamapsychiatry/fullarticle/2765557	Psy	Experience of mental health services and the lessons learned in Italy -> During epidemic: challenges have occurred in the management of health services ->Psychiatric wards have been reorganized to admit patients with COVID-19, and many physicians and nurses have been diverted to wards managing patients with COVID-19 -> Facilities for patients with psychiatric needs have been temporarily closed -> Patient confined in the facilities with very limited or no leave Considerable stresses Need for a leadership position in the psychosocial management of disasterlike situations.
Lancet 30APR2020	Obesity could shift severe COVID-19 disease to younger ages	Kass, David A.; et al. USA https://doi.org/10.1016/S0140-6736(20)31024-2	Clinic	Correlation of body-mass index (BMI) vs age in COVID-19 patients admitted to ICU at 5 US university hospitals, 265 patients (58% male) : - significant inverse correlation between age and BMI -> younger individuals admitted to hospital more likely obese. - no difference by sex -> In populations with high prevalence of obesity, COVID-19 will affect younger populations more than previously reported.
Viruses 30APR2020	The SARS-CoV-2 Exerts a Distinctive Strategy for Interacting with the ACE2 Human Receptor	Brielle, Esther S.; et al. Israel https://doi.org/10.3390/v12050497	Computational Structural Biology	Using molecular dynamics simulations to compare interaction between human ACE2 receptor and spike protein (SARS-CoV, SARS-CoV-2, and HCoV-NL63): - SARS-CoV and SARS-CoV-2 have comparable binding affinities achieved by balancing energetics and dynamics. -> SARS-CoV-2–ACE2 complex -> higher number of interacting residues larger, larger interface area, decreased interface residue fluctuations relative to the SARS-CoV–ACE2 complex. -> Data implies therapeutic challenge attributed to the enhanced rigidity of the COVID-19 RBD relative to that of SARS-2002.
Cell 30APR2020	Genomic Epidemiology of SARS-CoV-2 in Guangdong Province, China	Lu, Jing; et al. China http://www.sciencedirect.com/science/article/pii/S0092867420304864	Phylogenetic analysis	Extensive early surveillance in densely populated Guangdong, China's, 1.6 million tests from 30 Jan - 19 March, resulted in 1,388 reported RNA-positive SARS-CoV-2. 53 genomes generated from infected individuals (combination of metagenomic sequencing and tiling amplicon approaches) indicated: - most infections were due to virus importation to Guangdong, and chains of local transmission limited in size and duration, (clustering uncertain due to low virus genetic variation early in the pandemic). -> national travel restrictions and province's large-scale intensive surveillance and intervention measures helped reduce/ eliminate transmission chains. - vigilance still required following recent increase in COVID-19 cases imported to China from other countries.
Nature 29APR2020	Massively multiplexed nucleic acid detection using Cas13	Ackerman, Cheri M. and al. USA http://www.ncbi.nlm.nih.gov/pubmed/32349121	Diagnostic	Combinatorial Arrayed Reactions for Multiplexed Evaluation of Nucleic acids (CARMEN), a platform for scalable, multiplexed pathogen detection. The combination of CARMEN and Cas13 detection allowed to develop a multiplexed assay that simultaneously differentiates all 169 human-associated viruses with ≥10 published genome sequences and rapidly incorporated an additional crRNA to detect the causative agent of the 2020 COVID-19 pandemic. CARMEN-Cas13 further enables comprehensive subtyping of influenza A strains and multiplexed identification of dozens of HIV drug-resistance mutations. Conclusion: Scalable, highly-multiplexed CRISPR-based nucleic acid detection shifts diagnostic and surveillance efforts from targeted testing of high-priority samples to comprehensive testing of large sample sets.

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International journal of antimicrobial agents 29APR2020	Global coronavirus disease 2019: what has daily cumulative index taught us?	Lai C, and al China https://www.sciencedirect.com/science/article/pii/S092485792030159X	Public Health/Epidemiology	<p>Rapid increase of COVID19 cases in short time = insufficiency of healthcare system and negatively affect patient's outcome?</p> <p>Daily cumulative index (DCI) = cumulative cases/number of days between the first reported case and March 6. DCI significantly positively correlated with incidence (aRR:1,01 [1,00 – 1,02]) After adjustment of HCl or HAQI, DCI associated with mortality per 1,000,000 (aRR:1,02 [1,01 – 1,03])</p> <p>Higher level of healthcare performance is associated with higher incidence → ability to detect?</p> <p>→ Reduction of DCI:</p> <ul style="list-style-type: none"> - slow the increasing number of COVID19 - improve outcome in COVID-19 patients
Science 29APR2020	Changes in contact patterns shape the dynamics of the COVID-19 outbreak in China	Zhang J, and al China https://doi.org/10.1126/science.abb8001	Public Health/Epidemiology	<p>Analysis of contact surveys data in Wuhan and Shanghai before and during the outbreak → construction of a model Social distancing → ↓↓ 7-8-fold daily contact / most interaction restricted to household</p> <p>The model consider potential age differences in susceptibility to infection <u>Susceptibility to SARS-CoV-2 infection increase with age:</u></p> <ul style="list-style-type: none"> - 0-14 years: OR=0,34 [0,24 – 0,49] (compared to 15-64y) - > 65 years: OR=1,47 [1,12 – 1,92] (compared to 15-64y) <p><u>Model to study the impact of social distancing and school closures:</u></p> <ul style="list-style-type: none"> - social distancing alone is sufficient to control the outbreak - School closures → reduce peak incidence (40-60%) and delay the epidemic / impact on the disease dynamic and hospital surge capacity <p>→ Refining age-specific estimates of susceptibility to infection → to evaluating the impact of interventions put in place.</p>
PNAS 29APR2020	Effective treatment of severe COVID-19 patients with tocilizumab	Xu, Xiaoling et al, China https://doi.org/10.1073/pnas.2005615117	Therapeutic	<p>Retrospective study with tocilizumab, an IL6R inhibitor, in treatment of 21 patients with severe and critical COVID-19.</p> <p>Clinical data showed that the symptoms, hypoxigenmia, and CT opacity changes were improved immediately after the treatment with tocilizumab in most of the patients, suggesting that tocilizumab could be an efficient therapeutic for the treatment of COVID-19. No obvious adverse reactions were observed.</p> <p>Limitations: limited number of patients, single observation study.</p>
The Lancet 29APR2020	Remdesivir in adults with severe COVID-19: a randomised, double-blind, placebo-controlled, multicentre trial	Wang et al., China https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)31022-9/fulltext?utm_campaign=tlc-oronavirus20&utm_source=twitter&utm_medium=social	Therapeutic	<p>-> 237 patients were enrolled and randomly assigned to a treatment group (158 to remdesivir and 79 to placebo)</p> <p>-> Remdesivir use was not associated with a difference in time to clinical improvement (hazard ratio 1.23 [95% CI 0.87–1.75])</p> <p>-> Although not statistically significant, patients receiving remdesivir had a numerically faster time to clinical improvement than those receiving placebo among patients with symptom duration of 10 days or less (hazard ratio 1.52 [0.95–2.43])</p> <p>-> Adverse events were reported in 102 (66%) of 155 remdesivir recipients versus 50 (64%) of 78 placebo recipients. Remdesivir was stopped early because of adverse events in 18 (12%) patients versus four (5%) patients who stopped placebo early.</p>

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J Infect Dis 29APR2020	Effect of Convalescent Plasma Therapy on Viral Shedding and Survival in COVID-19 Patients	Zeng, Qing-Lei et al, China https://doi.org/10.1093/infdis/jiaa228	Therapeutic	6 COVID-19 subjects with respiratory failure received convalescent plasma at a median of 21.5 days after first detection of viral shedding. All tested negative for SARS-CoV-2 RNA by 3 days after infusion , and 5 died eventually . In conclusion, convalescent plasma treatment can discontinue SARS-CoV-2 shedding but cannot reduce mortality in critically end-stage COVID-19 patients, and treatment should be initiated earlier.
Cancer discovery 28APR2020	Patients with cancer appear more vulnerable to SARS-CoV-2: a multi-center study during the COVID-19 outbreak	Dai M, and al USA https://doi.org/10.1158/2159-8290.CCR-20-0422	Clinic	Patients with cancer are more vulnerable to infections 195 and 536 patients with and without cancer respectively matched. More in-hospital infection and smoking history in cancer group <u>Patient with cancer had higher:</u> - ICU admission [OR:2,84 (1,59 – 5,08)] - Death rate [OR:2,34 (1 15 – 4,77)] - Having one or more severe/critical symptom [OR:2,79 (1,74 – 4,41)] - Changes of needing MV Hematological, lung, metastatic cancer → higher rates of severe events → patients with cancer tend to have more severe outcomes
Critical Care 28APR2020	Clinical determinants for fatality of 44,672 patients with COVID-19	Deng G, and al China https://doi.org/10.1186/s13054-020-02902-w	Clinic Letter	Meta-analysis, confirmed cases series in China of 44672 patients Mortality rate all age → 2,3% CFR increase with age to 14,8 % in patients > 80 years <u>Risk factors for fatality:</u> - Male [RR:1,67 (1,47 – 1,89)] - Cardiovascular disease [RR:6,75 (5,4 – 8,43)] - HTA [HR:4,48 (3,69 – 5,85)] - Diabetes [RR:4,43 (3,49 – 5,61)] - Cancer [RR:2,92 (1,34 – 6,41)] - Respiratory disease [RR:3,43 (2,42 – 4,87)] More intensive surveillance for male and those with comorbidities
Natl Sci Rev 28APR2020	Plasma Metabolomic and Lipidomic Alterations Associated with COVID-19	Di Wu; Shu, et al. China https://doi.org/10.1093/nsr/nwaa086	Metabolite and lipid alterations	Targeted metabolomic and lipidomic analyses of plasma from cohort of COVID-19 patients to identify plasma biomarkers associated with COVID-19: - malic acid of the TCA cycle and carbamoyl phosphate of urea cycle reveal altered energy metabolism and hepatic dysfunction , respectively. - carbamoyl phosphate profoundly down-regulated in fatal patients compared with mild patients. - guanosine monophosphate (GMP) (mediated by GMP synthase, CD39 and CD73) significantly altered between healthy subjects vs COVID-19 patients, and between the mild vs fatal groups.
Public Health 28APR2020	Examining the Effect of Social Distancing on the Compound Growth Rate of SARS-CoV-2 at the County Level (United States) Using Statistical Analyses and a Random Forest Machine Learning Model	Cobb J and al, USA http://www.sciencedirect.com/science/article/pii/S0033350620301219	Public Health/Epidemiology	Trends among US counties and COVID 19 growth rate in relation to existence of shelter in place (SIP) orders Machin learning Limiting gatherings to < 10 people reduced growth rate by 6,6% SIP → reduction of 7,8% versus counties with no SIP SIP orders and limitation gathering were additive Features predicting the effect of SIP: - Population / Longitude / Population per square → SIP was effective → Counties with large population or high population density: benefit the most from a SIP

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Cell 28APR2020	Trained immunity: a tool for reducing susceptibility and severity of SARS-CoV-2 infection	Neteal et al., The Netherlands https://www.cell.com/pb-assets/products/coronavirus/CELL_11391_S5.pdf	Fundamental research	-> Long-term boosting of innate immune responses, also termed 'trained immunity', by certain live vaccines (BCG, oral polio vaccine, measles) induces heterologous protection against infections, through epigenetic, transcriptional and functional reprogramming of innate immune cells. -> We propose that induction of trained immunity by whole microorganism vaccines may represent an important tool for reducing susceptibility and severity to SARS-CoV-2.
Cell PreProof	Clinically Applicable AI System for Accurate Diagnosis, Quantitative Measurements and Prognosis of COVID-19 Pneumonia Using Computed Tomography	Zhang et al., China https://www.cell.com/pb-assets/products/coronavirus/CELL_CELL-D-20-00656.pdf	Diagnostic	Using a large computed Tomography (CT) database from 4,154 patients, we developed an AI system that can diagnose NCP and differentiate it from other common pneumonia and normal controls. -> Identification of important clinical and biochemical markers of multiple organs that correlated with the NCP lesion properties -> Together with the clinical data, this AI system was able to provide accurate clinical prognosis
Science Advances 27APR2020	Squalene-based multidrug nanoparticles for improved mitigation of uncontrolled inflammation	Dormont, Flavio et al, France https://doi.org/10.1126/sciadv.aaz5466	Therapeutic	Development of multidrug nanoparticles for the mitigation of uncontrolled inflammation. The nanoparticles are made by conjugating squalene, an endogenous lipid, to adenosine, an endogenous immunomodulator, and then encapsulating α -tocopherol, a natural antioxidant. This resulted in high drug loading, biocompatible, multidrug nanoparticles. By exploiting the vascular endothelial barrier dysfunction at sites of acute inflammation, these multidrug nanoparticles could deliver the therapeutic agents in a targeted manner and conferred a significant survival advantage to treated animals in lethal models of endotoxemia. -> Selectively delivering adenosine and antioxidants together could serve as a novel approach for the treatment of acute inflammation with reduced-side effects and high therapeutic potential.
European Journal of Clinical Microbiology & Infectious Diseases 27APR2020	Viral RNA load as determined by cell culture as a management tool for discharge of SARS-CoV-2 patients from infectious disease wards	La Scola, Bernard and al. France https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7185831/	Virology	It is of paramount importance to define when a treated patient can be considered as no longer contagious. Correlation between successful isolation of virus in cell culture and Ct value of quantitative RT-PCR targeting E gene suggests that patients with Ct above 33–34 using our RT-PCR system are not contagious and thus can be discharged from hospital care or strict confinement for non-hospitalized patients.
Microbial Pathogenesis 27APR2020	Design of a peptide-based subunit vaccine against novel coronavirus SARSCoV-2	Parismita Kalita et al., India-Japan http://www.sciencedirect.com/science/article/pii/S0882401020305234	Vaccines	Multi-peptide subunit-based epitope vaccine against COVID-19 containing and adjuvant, CTL, HTL and B Cell epitopes -> Epitopes were selected from known SARS-CoV-2 antigenic proteins (Nucleocapside, membrane, Spike) by using <i>in silico</i> prediction tools. -> Identification of 6 high immunogenic epitopes targeting HTL, 18 targeting CTL, 9 targeting B-cells. - Epitopes were linked together to build a 566 aa subunit vaccine - Human b-defensine 1 (68aa): as adjuvant Extensive bioinformatics analysis suggest that the vaccine is immunogenic, non-toxic, non-allergenic, thermostable, with the capability to elicit a humoral and cell-mediated immune response. The binding modes, dynamics, and stability of the vaccine-TLR3 complex were validated by using molecular dynamics simulation studies. Estimation of the half-life of the vaccine : - 30 h in mammalian reticulocytes (in vitro) - > 20 h in yeast (in vivo) - > 10 h in E. coli (in vivo), suggesting that the construct is stable in vivo -> Probability of showing good protective efficacy and safety against SARS-CoV-2 infection in humans

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Eurosurveillance 27APR2020	Coronavirus disease (COVID-19) – impact on vaccine preventable diseases	Hungerford et al., UK https://doi.org/10.2807/1560-7917.ES.2020.25.18.2000756	HSS/Politic	<p>COVID-19 has caused an unintentional drop of the European's delivery of routine immunisations of 2020 birth cohorts + catch up campaigns+ immunisation of at risk groups because of:</p> <ol style="list-style-type: none"> 1. Isolation + COVID-19 illness in families with newborn children 2. Disruption of vaccine supplies 3. Healthcare staffing issues 4. Difficulty to launch a prevention campaign for adults at risk <p>Impact:</p> <ul style="list-style-type: none"> • Increase in number of sensitive children facing winter illnesses • The poorest populations are disproportionately affected • Risk of outbreaks of diseases such as measles... <p>To deal with this impact,</p> <ul style="list-style-type: none"> - ensure consideration + resources for delivery of routine vaccination - Vaccination rates should be monitored by analysts and immunization teams to identify hotspots = vaccine coverage surveillance + modeling. <p>This will help face and not allow the Covid to increase the disability and mortality from vaccine preventable diseases. 391 cases and 1286 close contact</p>
The Lancet. Infectious diseases 27APR2020	Epidemiology and transmission of COVID-19 in 391 cases and 1286 of their close contacts in Shenzhen, China: a retrospective cohort study	Qifang B and al, China/USA http://www.sciencedirect.com/science/article/pii/S1473309920302875	Public Health/Epidemiology	<p>Cases were older - Most case mild or moderate and 9% severe Median incubation period: 4,8 days All those develop symptoms will do within 14 days Median time recovery: 20,8 days Contact tracing reduced isolation period by 1,9 days Higher risk of infection:</p> <ul style="list-style-type: none"> - Household contact (OR6,27) - Contact travelling with a case (OR:7,06) <p>Secondary attack = 11,2% Children likely to be infected (7,4%) than adults (6,6%) → Isolation and contact tracing reduce the R and time during which cases are infectious → children similar risk → analyses for transmission and control</p>
Inter J Infectious Disease 27APR2020	Coronavirus disease 2019 in pregnancy	Xu Q and al, China http://www.sciencedirect.com/science/article/pii/S1201971220302800	Clinic	<p>Pregnant woman (28) compared to non-pregnant woman (54) Time from illness to admission: shorter pregnant women Laboratory: significantly</p> <ul style="list-style-type: none"> - Higher leukocyte in pregnant women (10 vs 2 x10⁹/L) - Higher CRP (17 vs 14 mg/dl) <p>75% pregnant received antiviral vs 100% non-pregnant</p> <p>No association between</p> <ul style="list-style-type: none"> - pregnancy and virus clearance time - pregnancy and LOS - pregnancy and severity of disease <p>Median gestational age: 38 [IQR:36,5 – 39] None of neonates had a positive result for SARS-CoV-2 → no vertical transmission – good outcomes for both group</p>
Pathogens 26APR2020	Emergence of Drift Variants That May Affect COVID-19 Vaccine Development and Antibody Treatment	Takahiko Koyama et al., USA https://doi.org/10.3390/pathogens9050324	Vaccines	<p>> Twenty-one virus variants affecting T-cell epitopes identified. > Twelve virus variants affecting B-cell epitopes of spike protein (S), nucleocapsid protein (N), and membrane protein (M) identified</p> <p>A variant replacing 23403A>G in the S protein B-Cell epitope has been frequently observed in European countries (Netherlands, Switzerland, and France) although it is not yet known if it is the predominant sub-strain.</p> <p>This change involves a substitution of a large acidic residue D (aspartic acid) into small hydrophobic residue G (glycine), meaning differences in both size and hydrophobicity in the middle of the epitope and compromising the action of vaccines against wt S protein> Genetic drift</p> <p>> Vaccine design and convalescent plasma antibody treatment might require specific considerations to accommodate the drift</p>

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The Lancet. Infectious diseases 27APR2020	Epidemiology and transmission of COVID-19 in 391 cases and 1286 of their close contacts in Shenzhen, China: a retrospective cohort study	Qifang B and al, China/USA http://www.sciencedirect.com/science/article/pii/S1473309920302875	Public Health/Epidemiology	<p>391 cases and 1286 close contact</p> <p>Cases were older - Most case mild or moderate and 9% severe Median incubation period: 4,8 days All those develop symptoms will do within 14 days Median time recovery: 20,8 days Contact tracing reduced isolation period by 1,9 days Higher risk of infection:</p> <ul style="list-style-type: none"> - Household contact (OR:6,27) - Contact travelling with a case (OR:7,06) <p>Secondary attack = 11,2% Children likely to be infected (7,4%) than adults (6,6%)</p> <p>→ Isolation and contact tracing reduce the R and time during which cases are infectious → children similar risk → analyses for transmission and control</p>
An International Journal of Obstetrics & Gynaecology 27APR2020	Vaginal delivery in SARS-CoV-2 infected pregnant women in Northern Italy: a retrospective analysis	Ferrazzi E and al, Italy https://doi.org/10.1111/1471-0528.16278	Clinic	<p>42-woman COVID-19 who delivered during study period Diagnosis COVID: 10 before delivered / 27 in delivery room / 5 within 36h after 19 woman diagnosed pneumonia which 4 admitted ICU 24 cases vaginal delivery – 10 cesareans related to COVID19 Cesareans related to pneumonia (p=0,024) 3 neonates positive for SARS-CoV:</p> <ul style="list-style-type: none"> - 2 newborns of women diagnosed after delivery - 1 newborn after vaginal delivery: gastrointestinal and respiratory symptoms → ICU with 24h of MV <p>→ vaginal delivery is appropriated → cesarean: women with sever symptoms</p>
Clinical microbiology and infection 25APR2020	Umifenovir treatment is not associated with improved outcomes in patients with coronavirus disease 2019: A retrospective study	Lian, Ningfang et al, China http://www.sciencedirect.com/science/article/pii/S1198743X20302342	Therapeutic	<p>Retrospective study, 81 COVID-19 patients included, with 45 in umifenovir group and 36 in control group. Baseline clinical, laboratory characteristics were comparable between two groups.</p> <p>Umifenovir treatment did not shorten the negativity time of SARS-CoV-2, or the length of hospital stay in non-ICU hospitalized patients with COVID-19. No severe side effect was found in umifenovir treatment.</p> <p>Limitations : single center, retrospective study with a small sample size ; pharyngeal swabs were not collected every day due to the limited medical resources, and pathogenic nucleic acids were not quantified as well ; only included patients with moderate and severe COVID-19, so the effectiveness of umifenovir in mild and critical patients cannot be confirmed in this study</p>
Cell 24APR2020	SARS-CoV-2 receptor ACE2 is an interferon-stimulated gene in human airway epithelial cells and is detected in specific cell subsets across tissues	Ziegler et al., USA https://www.cell.com/cell/fulltext/S0092-8674(20)30500-6	Fundamental research	<p>-> Meta-analysis of human, primate & mouse scRNA-seq for putative SARS-CoV-2 targets -> Type II pneumocytes, nasal secretory cells & absorptive enterocytes are ACE2+TMPRSS2+ -> Interferon & influenza increase ACE2 in human nasal epithelia and lung tissue -> Mouse Ace2 is not upregulated by interferon, raising implications for disease models</p>
Infection, Genetics and Evolution 24APR2020	Emerging genetic diversity among clinical isolates of SARS-CoV-2: Lessons for today	Sheikh, Javaid Ahmad; et al. India-Germany-UK https://doi.org/10.1016/j.meegid.2020.104330	Phylogenetics	<p>Machine learning approaches to analyse genome sequences of 257 available SARS-CoV-2 clinical isolates :</p> <ul style="list-style-type: none"> - At least 5 different clades of SARS-CoV-2, great deal of genetic diversity emerging among clinical isolates. - Every continent appears to have multiple introductions of different viral strains (no geographical clustering unlike previous pandemics). - 5' terminal of viral genome more prone to mutations compared to 3' end. - ORF1ab, spike, ORF3a and E proteins most prone to mutations. - RBD of spike protein is a mutational hotspot (major driver of diversity). - Greater transmission/mortality in the Lombardy region (Italy), compared to other European countries or African continent or China, could not be correlated to any specific molecular divergence pattern.

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Annals of the rheumatic diseases 24APR2020	Clinical course of coronavirus disease 2019 (COVID-19) in a series of 17 patients with systemic lupus erythematosus under long-term treatment with hydroxychloroquine	Mathian, Alexis et al, France https://ard.bmj.com/content/early/2020/04/24/a-nnrheumdis-2020-217566.long	Therapeutic	<p>Observational study with the aim to follow the clinical course of COVID-19 in patients with systemic lupus erythematosus (SLE) who received long-term treatment with HCQ (17 patients).</p> <p>-> Main comorbidities were obesity and chronic kidney disease. The duration of HCQ treatment prior to COVID-19 was relatively long, with a median (range) of 7.5 (0.5–29.8) years. Twelve (71%) patients were also treated with prednisone, and seven (41%) with an immunosuppressant. -> This case series does not allow to draw conclusions on the incidence rate and severity of COVID-19 in SLE. However, it gives a first clinical picture of the course of this infection in patients with SLE treated with HCQ.</p> <p>Based on the observation that most of the patients with SLE in this study received long-term treatment with HCQ, having blood concentrations of the drug within therapeutic range, is that HCQ does not seem to prevent COVID-19, at least its severe forms, in patients with SLE.</p>
Cell 24APR2020	Clinically Applicable AI System for Accurate Diagnosis, Quantitative Measurements and Prognosis of COVID-19 Pneumonia Using Computed Tomography	Zhang, Ket al., China https://www.cell.com/pb-assets/products/coronavirus/CELL_CELL-D-20-00656.pdf	Diagnostics	<p>Many COVID-19 patients develop pneumonia called novel coronavirus pneumonia (NCP) and rapidly progress to respiratory failure. However, rapid diagnosis and identification of high-risk patients for early intervention are challenging.</p> <p>Development of an AI system that can diagnose NCP and differentiate it from other common pneumonia and normal controls.</p> <p>The AI system can assist radiologists and physicians in performing a quick diagnosis and is able to identify important clinical markers that correlated with the NCP lesion properties.</p> <p>It provides accurate clinical prognosis that can aid clinicians to consider appropriate early clinical management and allocate resources appropriately.</p> <p>This AI system has been made available globally to assist the clinicians to combat COVID-19.</p>
J Med Virol 24APR2020	SARS-CoV-2 can be detected in urine, blood, anal swabs and oropharyngeal swabs specimens	Peng, Liang and al. China https://onlinelibrary.wiley.com/doi/abs/10.1002/jmv.25936	Diagnostics	<p>To assess the presence of the SARS-CoV-2 ribonucleic acid (RNA) in urine and blood specimens, and anal and oropharyngeal swabs.</p> <p>SARS-CoV-2 RNA was present in all 4 specimen types, though not all specimen types were positive simultaneously.</p> <p>CI*: SARS-CoV-2 can infect multiple systems, including the urinary tract. Testing different specimen types may be useful for monitoring disease changes and progression, and for establishing a prognosis</p>
JAMA network open, 24APR2020	Effect of High vs Low Doses of Chloroquine Diphosphate as Adjunctive Therapy for Patients Hospitalized With Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) Infection: A Randomized Clinical Trial	Borba, Mayla Gabriela Silva et al, Brazil, https://doi.org/10.1001/jamanetworkopen.2020.8857	Therapeutic	<p>Parallel, double-masked, randomized, phase IIb clinical trial 81 adult patients with severe acute respiratory syndrome SARS-CoV-2 infection</p> <p>High-dosage CQ (ie, 600 mg CQ twice daily for 10 days) versus low-dosage CQ (ie, 450 mg twice daily on day 1 and once daily for 4 days)</p> <p>At Day 13, 6 of 40 patients (15.0%) in the low-dose group had died, compared with 16 of 41 patients (39.0%) in the high-dose group. Prolongation of QTc interval was observed in 4 of 36 patients (11.1%) in the low-dose group and 7 of 37 patients (18.9%) in the high-dose group. In addition, 2 patients in the high-dose group (2.7%) experienced ventricular tachycardia. The trial was stopped.</p> <p>The preliminary findings of this study suggest that the higher CQ dosage should not be recommended for critically ill patients with COVID-19</p>

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Nature Medicine 24APR2020	The QT interval in patients with COVID-19 treated with hydroxychloroquine and azithromycin	Chorin, Ehud et al, USA https://doi.org/10.1038/s41591-020-0888-2	Therapeutic	<p>Charts review and corrected QT (QTc) interval follow-up in a consecutive cohort of 84 patients receiving HY (400mg daily on D1, then 200mg daily from D2 to D5)/AZ (500mg per day for 5 days).</p> <ul style="list-style-type: none"> • QTc significantly prolonged. • In a subset of nine (11%) of those patients, the QTc was severely prolonged to >500 ms, a known marker of high risk of malignant arrhythmia and sudden cardiac death. Five of the nine patients had a normal QTc at baseline. • No torsades de pointes events recorded for any patients, including those with a severely prolonged QTc. <p>=> Suggest that the QTc should be followed repeatedly in patients with COVID-19 who are treated with HY/AZ, particularly in those with co-morbidities and in those who are treated with other QT-prolonging medications.</p>
JAMA Pediatrics 24APR2020	Mental Health Status Among Children in Home Confinement During the Coronavirus Disease 2019 Outbreak in Hubei Province, China	Xinyan Xie et al., China https://jamanetwork.com/journals/jamapediatrics/fullarticle/2765196	Psy	<p>Investigation of depressive and anxiety symptoms among students in Hubei province, China.</p> <p>Restricted to home for a mean (SD) of 33.7 days -> A total of 403 students (22.6%) and 337 students (18.9%) reported depressive and anxiety symptoms, respectively. -> Students in Wuhan: significantly higher CDI-S scores than those in Huangshi + greater risk of depressive symptoms -> Students who were slightly or not worried about being affected by COVID-19 had significantly lower CDI-S scores than those who were quite worried, with a decreased risk of depressive symptoms. Those who were not optimistic about the epidemic, compared with those who were quite optimistic, had significantly higher CDI-S scores, with an increased risk of depressive symptoms.</p> <p>There was no significant association between demographic characteristics and anxiety symptoms.</p>
Nat Com 24APR2020	Neutralization of SARS-CoV-2 spike pseudotyped virus by recombinant ACE2-Ig	Lei, Changhai et al, China https://doi.org/10.1038/s41467-020-16048-4	Therapeutic	<p>A recombinant protein was generated by connecting the extracellular domain of human ACE2 to the Fc region of the human immunoglobulin IgG1. A fusion protein containing an ACE2 mutant with low catalytic activity is also used in this study. The fusion proteins are then characterized.</p> <ul style="list-style-type: none"> • Both fusion proteins have a high binding affinity for the receptor-binding domains of SARS-CoV and SARS-CoV-2 and exhibit desirable pharmacological properties in mice. • Moreover, the fusion proteins neutralize virus pseudotyped with SARS-CoV or SARS-CoV-2 spike proteins in vitro. <p>=> As these fusion proteins exhibit cross-reactivity against coronaviruses, they have potential applications in the diagnosis, prophylaxis, and treatment of SARS-CoV-2.</p>
Clinica Chimica Acta 23APR2020	Highly sensitive detection of SARS-CoV-2 RNA by multiplex rRT-PCR for molecular diagnosis of COVID-19 by clinical laboratories	Shige, Takayuki and al. Japan https://www.sciencedirect.com/science/article/pii/S009898120301789	Diagnostics	<p>Three genes are used for multiplex rRT-PCR: the Sarbecovirus specific E gene, the SARS-CoV-2 specific N gene, and the human ABL1 gene as an internal control.</p> <p>CI*: The proposed multiplex rRT-PCR methodology enable highly sensitive detection of SARS-CoV-2 RNA, reducing reagent use and cost, and time required by clinical laboratory technicians.</p> <p>32 patients with COVID 19 and direct oral anticoagulants (DOACs) eligible for antiviral therapy (lopinavir, ritonavir or darunavir)</p>
Journal of Thrombosis and Haemostasis 23APR2020	Direct oral anticoagulant plasma levels striking increase in severe COVID-19 respiratory syndrome patients treated with antiviral agents. The Cremona experience	Testa, Sophie et al, Italy https://doi.org/10.1111/jth.14871	Therapeutic	<p>DOAC stopped in 20, and continued in 12. On average, C-trough DOAC levels were 6.14 times higher during hospitalization than in pre-hospitalization period</p> <p>Physicians should consider withholding DOACs from patients with SARS-CoV-2 and replacing them with alternative parenteral antithrombotic strategies for as long as antiviral agents are deemed necessary and until discharge</p>

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BMJ 23APR2020	Covid-19: Two thirds of healthcare workers who have died were from ethnic minorities	Rimmer et al., UK https://doi.org/10.1136/bmj.m1621	HSS/Politik	<p>'- Two thirds of healthcare workers who have died from covid-19 were from an ethnic minority background, and at least half were not born in the UK : causes could be biological, medical, or sociological => need for a concerted effort to seek explanations and solutions.</p> <p>Notable absence of deaths occurred among certain staff groups:</p> <p>'- Deaths notably in surgery (five cases), general practice (four), emergency medicine (two. No anaesthetists or intensivists. =>Better use of PPE?</p> <p>Need for a central registry of deaths among health and social care workers</p>
Canadian Journal of Political Science 23APR2020	Sociodemographic and psychological correlates of compliance with the Covid-19 public health measures in France	Bouraurd et al., France https://doi.org/10.1017/S0008423920000335	HSS/Politik	<p>In order to face the Covid-19 pandemic, the French government adopted health measures at an unprecedented scale to slow the spread of the virus.</p> <p>However, compliance by citizens cannot be taken for granted.</p> <p>Individual panel data => personality and demographic characteristics are relevant predictors of compliance, more than ideology, trust (towards the government and scientists), and emotional reactions.</p> <p>Main characteristics that lead to complying with the measures are :</p> <ul style="list-style-type: none"> - Age (older people) - Sex (women) - Conscientiousness <p>Characteristics with no impact on behavior :</p> <ul style="list-style-type: none"> - Education - Extraversion - Neuroticism - Ideological extremity
Nature Medicine 23APR2020	SARS-CoV-2 entry factors are highly expressed in nasal epithelial cells together with innate immune genes	Sungnak, Waradon; et al. UK-France-Netherlands-Germany-USA https://doi.org/10.1038/s41591-020-0868-6	Fundamental research	<p>Tropism analysis from single cell RNA-seq datasets from multiple tissues from healthy human donors (Human Cell Atlas tissue consortium):</p> <ul style="list-style-type: none"> - ACE2 expressed in cells from multiple tissues at generally low levels. - TMPRSS2 highly expressed with a broader distribution, suggesting that ACE2, rather than TMPRSS2, may be a limiting factor for intal viral entry stage. - ACE2 and TMPRSS2 highest co-expression in nasal secretory epithelial cells (nasal goblet and ciliated cells), co-expressed with genes involved in innate immunity. <p>Expression of viral receptor genes used by other coronaviruses and influenza viruses (ANPEP used by HCoV-22944, DPP4 used by MERS-CoV45, ST6GAL1, ST3GAL4 important for influenza viruses) show :</p> <ul style="list-style-type: none"> - expression distribution coincided with viral transmissibility based on a comparison to R0 -> upper airway in viruses with higher R0/infectivity (SARS-CoV-2, influenza) vs lower airway/lung parenchyma for MERS-CoV <p>-> All data provided as a user-friendly an open resource: www.covid19cellatlas.org 106 patients COVID19+ and CT angiograms</p>
Radiology 23APR2020	Acute Pulmonary Embolism in COVID-19 Patients on CT Angiography and Relationship to D-Dimer Levels	Leonard-Lorant I and al, France https://doi.org/10.1148/radiol.2020201561	Clinic/Radiology	<p>32 (30%) positive for pulmonary embolus:</p> <ul style="list-style-type: none"> - Higher D-dimer levels (6110 vs 1920, p<0,01) - More in ICU (75% vs 32ù, p<0,01) - Treated more often with LWMH (78% vs 23%) <p>D-dimer levels >2660µg/L :</p> <ul style="list-style-type: none"> - Sensitivity 100% - Specificity 67%

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Emerging Infectious Disease 23APR2020	Population-Based Estimates of Chronic Conditions Affecting Risk for Complications from Coronavirus Disease, United States	Mary L. Adams; USA https://doi.org/10.3201/eid2608.200679	Demographic / Risk assessment	<p>USA demographic analysis to infer risk for complications from COVID-19 due to chronic conditions: (Based on publicly available 2017 Behavioral Risk Factor Surveillance System (BRFSS) data from telephone surveys of 444,649 randomly selected adults (>18 years of age) in the 50 states and District of Columbia).</p> <p>-> 45.4% of US adults are potentially at increased risk of complications because of cardiovascular disease, diabetes, respiratory disease, hypertension, or cancer.</p> <p>- Rates increased by age: 19.8% for 18–29 years of age, 80.7% for persons >80 years of age, and varied by state, race/ethnicity, health insurance status, and employment.</p>
Analytical chemistry 23APR2020	Rapid and sensitive detection of anti-SARS-CoV-2 IgG using lanthanide-doped nanoparticles-based lateral flow immunoassay	Chen, Zhenhua and al. China https://pubs.acs.org/doi/abs/10.1021/acs.analchem.0c00784	Diagnostics	<p>Simple and rapid immunodiagnostic method based on lateral flow immunoassay (LFIA) that uses lanthanide-doped polystyrene nanoparticles (LNPs) to detect anti-SARV-CoV-2 IgG in human serum.</p> <p>The results of the validation experiment met the requirements for clinical diagnostic reagents</p> <p>Conclusion: this new assay can achieve rapid and sensitive detection of anti-SARS-CoV-2 IgG in human serum and allow positive identification in suspicious cases; it can also be useful for monitoring the progression COVID-19 and evaluating patients' response to treatment.</p>
Science of the Total Environment journal 22APR2020	COVID-19 outbreak: Migration, effects on society, global environment and prevention	Chakraborty et al., India https://doi.org/10.1016/j.scitotenv.2020.138882	HSS/Politic	<p>Economic impact: - Threat of high inflation and high unemployment as a result of lack of productivity and increased expenditures - For each month there will be an approximate loss of 2% points in annual GDP growth - The tourism sector alone faces an output decrease as high as 50% to 70%</p> <p>Global environment : -> Non-functioning of industries: decrease of industrial waste emission, recovery of ecosystems and revival of ozone layer. ->Deforestation linked to disease outbreaks. ->Population growth: increasing sources of pollution + deforestation = exposing populations to new pathogens</p> <p>The global strategy for COVID-19 prevention and control: • Global threat that requires a global response involving all countries – in the short term: Restricting mass gatherings + research for new drugs/vaccines/prevention</p> <p>• In the long run: o Forestation/Respecting wildlife habitats. o Control of population growth o Global ban on wildlife trade</p>
Science 22APR2020	Structure-based design of antiviral drug candidates targeting the SARS-CoV-2 main protease	Dai, Wenhao et al, China https://doi.org/10.1126/science.abb4489	Therapeutic	<p>The main protease (Mpro) of SARS-CoV-2 is a key enzyme that plays a pivotal role in mediating viral replication and transcription.</p> <p>Two lead compounds (11a and 11b) targeting Mpro were designed and synthesized.</p> <p>Both exhibited excellent inhibitory activity and potent anti-SARS-CoV-2 infection activity. The X-ray crystal structures of SARS-CoV-2 Mpro in complex with 11a or 11b, both determined at 1.5 Å resolution, showed that the aldehyde groups of 11a and 11b are covalently bound to Cys145 of Mpro.</p> <p>Both compounds showed good PK properties in vivo, and 11a also exhibited low toxicity, suggesting that these compounds are promising drug candidates.</p>

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European Journal of Epidemiology 22APR2020	Vaccine confidence in the time of COVID-19	Harrison et al., US https://doi.org/10.1007/s10654-020-00634-3	HSS/Politic	<p>Rushing for a vaccine in the Covid19 epidemic will not solve the problem of vaccine hesitation among the population.</p> <p>Need to re-imagine the culture of public health more broadly than the delivery of vaccine /technology</p> <p>4 points to consider:</p> <ol style="list-style-type: none"> 1- Vaccination technologies presented as a technical/ objective solution to the problem of prevention and health of the population. The broader view of public health (social/political equality...) has been eroded: idea that vaccines could obviate need for broader social and environmental policies kept prevention in clinical hands. 2- The success, in the first years, of preventive mass vaccination programs ≠ a timeless public acceptance of vaccination as a preventive strategy. Result of a complex set of circumstances. 3- Reluctance to vaccinate: symptom of a greater desire to ignore threats because they are not bothersome or do not constitute an emergency (yet). 4- Essential ethical dilemma of public health: tension between autonomy and state power <p>Oppose a logic of "care": capacity of the States to provide the biomedical resources but also the economic and social resources making it possible to fairly protect the life of the citizens against health disasters.</p> <p>=> A broader confidence in vaccines or any pre-emptive measure depends on widespread public trust in preventive health directives and involves strong care and social solidarity structures.</p>
The Lancet Infectious diseases 22APR2020	No SARS-CoV-2 detected in amniotic fluid in mid-pregnancy	Yu, Nan; et al. China https://doi.org/10.1016/S1473-3099(20)30320-0	Clinic	<p>2 pregnant women diagnosed with COVID-19 at first trimester :</p> <ul style="list-style-type: none"> - In the second trimester, both positive for SARS-CoV-2 total antibodies in serum and negative for SARS-CoV-2 RNA in throat swabs. - Amniotic fluid : negative (RT-PCR) and SARS-CoV-2 IgM and IgG negative in both patients. - In serum : both IgG positive, and only case 1 tested positive for IgM. <p>-> No SARS-CoV-2 detected in the amniotic fluid of both women diagnosed with COVID-19 in early stage of pregnancy.</p> <ul style="list-style-type: none"> - Limit : Only 2 patients, sensitivity (RNA is much less stable in amniotic fluid than is DNA), lack of cord blood.
Eur J Neurol 22APR2020	Acute-onset smell and taste disorders in the context of Covid-19: a pilot multicenter PCR-based case-control study	Beltran-Corbellini A and al, Spain https://doi.org/10.1111/ene.14973	Clinic	<p>Multicenter study – cases (79) controls (40) study</p> <p><i>Controls: historical group of season influenza patients</i></p> <p>Basal characteristics: no difference between group</p> <p><u>Cases</u>: 31(39%) with new onset smell or taste disorders (STD): for 35.5% initial symptoms</p> <p>Now-set of STD more frequent in cases than controls:</p> <ul style="list-style-type: none"> - Adjusted OR: 21,4 [2.77 – 165.4] <p>No difference for gender/smoking habits/severity between STD or not in case group.</p> <p>Increased frequency of STD in young patients</p> <p>STD more frequent among COVID-19 patients</p> <p><u>Limitations</u>: historical controls – lack of comparison with others virus – self reported questionnaire</p> <p>100 patients COVID19+ and severely ill</p> <p>Mean age: 66 years and 70% males</p> <p>23% had acute pulmonary embolus:</p> <ul style="list-style-type: none"> - More frequent in critical care unit (p<0,01) - Longer delay from symptoms onset to CT (12 d) <p>Requirement of mechanical ventilation was associated with pulmonary embolus (OR=3,8, p=0,049)</p> <p>Extent of lesions was not associated with pulmonary embolus.</p> <p>Contrast enhanced CT rather for these patients</p>
Radiology 22APR2020	Acute Pulmonary Embolism Associated with COVID-19 Pneumonia Detected by Pulmonary CT Angiography	Grillet F and al, France https://doi.org/10.1148/radiol.202001544	Clinic/Radiology	<p>100 patients COVID19+ and severely ill</p> <p>Mean age: 66 years and 70% males</p> <p>23% had acute pulmonary embolus:</p> <ul style="list-style-type: none"> - More frequent in critical care unit (p<0,01) - Longer delay from symptoms onset to CT (12 d) <p>Requirement of mechanical ventilation was associated with pulmonary embolus (OR=3,8, p=0,049)</p> <p>Extent of lesions was not associated with pulmonary embolus.</p> <p>Contrast enhanced CT rather for these patients</p>

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Science of the Total Environment journal 22APR2020	COVID-19 outbreak: Migration, effects on society, global environment and prevention	Chakraborty, I. al., India https://doi.org/10.1016/j.otenv.2020.138882	HSS/Politic	<p>Economic impact:</p> <ul style="list-style-type: none"> - Threat of high inflation and high unemployment as a result of lack of productivity and increased expenditures - For each month there will be an approximate loss of 2% points in annual GDP growth - The tourism sector alone faces an output decrease as high as 50% to 70% <p>Global environment :</p> <ul style="list-style-type: none"> -Non-functioning of industries: decrease of industrial waste emission, recovery of ecosystems and revival of ozone layer. -Deforestation linked to disease outbreaks. -Population growth: increasing sources of pollution + deforestation = exposing populations to new pathogens <p>The global strategy for COVID-19 prevention and control:</p> <ul style="list-style-type: none"> • Global threat that requires a global response involving all countries – in the short term: Restricting mass gatherings + research for new drugs/vaccines/prevention • In the long run: <ul style="list-style-type: none"> o Forestation/Respecting wildlife habitats. o Control of population growth o Global ban on wildlife trade
Gastroenterology, 21APR2020	Characteristics and prognosis of patients with inflammatory bowel disease during the SARS-CoV-2 pandemic in the Basque Country (Spain)	Rodríguez-Lago, Iago et al, Espagne, https://doi.org/10.1053/j.gastro.2020.04.043	Clinic Gastroenterology	<p>Patients (N=40) with inflammatory bowel disease (IBD and a positive test for SARS-CoV-2 from 5 sites as for the 8th April 2020. Mean age: 59 (range 18 – 90) 28% under immunomodulator (28%) and 18% under biologic monotherapy.</p> <p>Most frequent symptoms: fever (77%) and cough (67%), with 21% reporting diarrhea</p> <p>No patient was admitted to the ICU</p> <p>Two deaths were reported (5%):</p> <ul style="list-style-type: none"> a 86-year-old male with diabetes, prostate adenocarcinoma and ulcerative proctitis on mesalamine a 77-year-old male with dementia and left-sided ulcerative colitis under mesalamine and methotrexate. <p>patients with IBD and COVID have a good overall prognosis</p>
Ophthalmology 21APR2020	Ocular Findings and Proportion with Conjunctival SARS-COV-2 in COVID-19 Patients	Zhou, Yunyun and al. China https://www.sciencedirect.com/science/article/pii/S016164202030405X	Virology	<p>Study of 121 patients</p> <p>SARS-CoV-2 RNA could be detected in the conjunctival swabs of 2.5% (3/121) patients.</p> <p>->Eight patients (6.6%) had ocular symptoms: itching, redness, tearing, discharge, and foreign body sensation.</p> <p>->Two patients without ocular symptoms tested positive for conjunctival SARS-CoV-2.</p> <p>The appearance of ocular symptoms or the result of conjunctival SARS-CoV-2 detection was not significantly correlated with the duration of disease. The proportion with a positive result for SARS-CoV-2 RNA was significantly different between the conjunctival and nasopharyngeal specimens. These findings may help to improve precaution practices during the COVID-19 pandemic.</p>
Gastroenterology 22APR2020	Prevalence and Characteristics of Gastrointestinal Symptoms in Patients with SARS-CoV-2 Infection in the United States: A Multicenter Cohort Study	Walker D.R and al, USA https://doi.org/10.1053/j.gastro.2020.04.045	Clinic	<p>Multicenter study (9 centers) - 318 patients COVID+ 61,3%= reported at least 1 gastrointestinal symptom: anorexia (34,8%), diarrhea (33,7%) and nausea (26,4%) Lost of smell/taste more frequent in gastrointestinal symptoms group (p<0,05) No difference in patients with gastrointestinal symptom and those without for:</p> <ul style="list-style-type: none"> - Laboratory results - Rates of clinical deterioration - ICU admission, mechanical ventilation, mortality

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The Lancet Psychiatry 21APR2020	Suicide risk and prevention during the COVID-19 pandemic	Gunnel et al., UK https://doi.org/10.1016/S2215-0366(20)30171-1	Psy	->Suggestions that suicide rates will rise ->Many people vulnerable to mental health problems and suicidal behaviour ->Need for timely public health responses: list of actions presented in the publication Mental health consequences are likely to be present for longer and peak later than the actual pandemic.
Emerging Infectious Disease journal 21APR2020	Possible Bat Origin of Severe Acute Respiratory Syndrome Coronavirus 2	Susanna K.P. Lau; et al. Hong Kong, China https://doi.org/10.3201/eid2607.200092	Virology	Phylogenetic analysis : - SARS-CoV-2 genome closest to that of SARS-related coronaviruses (SARSr-CoVs) from horseshoe bats, and receptor-binding domain (RBD) closest to that of pangolin viruses. - Potential recombination sites identified around the RBD region - none of existing SARSr-CoVs represents its immediate ancestor. -> SARS-CoV-2 probably a novel recombinant virus (genome backbone evolved from Yunnan bat virus–like SARSr-CoVs and RBD from pangolin virus–like SARSr-CoVs). Its origin and direct ancestral viruses not identified. Retrospective study – hospitalized patients only 3497 samples collected from 96 patients COVID-19 Samples: serum/respiratory/stool/urine Duration of virus significantly longer in stool samples <u>Respiratory samples:</u> - median duration of virus in severe disease was significantly longer than in mild disease (14 days, 10-21 days; P=0.04) - patients with severe disease: significantly higher viral loads. - Letter shedding peak in severe group Other samples: no difference No effect of the antiviral treatment on viral load/duration <u>Factors associated significantly with duration of virus:</u> - glucocorticoid > 10 days in severe group - men - > 60 years <u>Limitations:</u> small sample size / viral load influenced by many factors
BMJ 21APR2020	Viral load dynamics and disease severity in patients infected with SARS-CoV-2 in Zhejiang province, China, January-March 2020: retrospective cohort study	Zheng S and al, China https://doi.org/10.1136/bmj.m1443	Clinic/Virology	Evaluation of coagulation abnormalities via traditional tests and whole blood thromboelastometry profiles in a group of 22 patients with COVID and acute respiratory failure due to COVID-19 (mean age 67 ± 8 years, M:F 20:2) compared to 44 controls. Cases showed significantly higher fibrinogen and D-dimer plasma levels versus healthy controls Markedly hypercoagulable thromboelastometry profiles in COVID-19 patients, COVID-19 patients with acute respiratory failure present a severe hypercoagulability rather than consumptive coagulopathy
Thrombosis and haemostasis, 21APR2020	COVID-19-Related Severe Hypercoagulability in Patients Admitted to Intensive Care Unit for Acute Respiratory Failure	Spiezia, Luca et al, Italy https://www.ncbi.nlm.nih.gov/pubmed/32316063	Clinic Hematology	Evaluation of coagulation abnormalities via traditional tests and whole blood thromboelastometry profiles in a group of 22 patients with COVID and acute respiratory failure due to COVID-19 (mean age 67 ± 8 years, M:F 20:2) compared to 44 controls. Cases showed significantly higher fibrinogen and D-dimer plasma levels versus healthy controls Markedly hypercoagulable thromboelastometry profiles in COVID-19 patients, COVID-19 patients with acute respiratory failure present a severe hypercoagulability rather than consumptive coagulopathy
CDC Morbidity and Mortality Weekly Report 20APR2020	Cleaning and Disinfectant Chemical Exposures and Temporal Associations with COVID-19 — National Poison Data System, United States, January 1, 2020–March 31, 2020	Chang et al., USA https://www.cdc.gov/mmwr/volumes/69/wr/mm6916e1.htm?_cid=mm6916e1_wicontribAff	Public Health/Epidemiology	->To assess whether there might be a possible association between COVID-19 cleaning recommendations from public health agencies and the media and the number of chemical exposures reported to the National Poison Data System (NPDS) -> During January–March 2020, poison centers received 45,550 exposure calls related to cleaners (28,158) and disinfectants (17,392), representing overall increases of 20.4% and 16.4% from January–March 2019 (37,822) and January–March 2018 (39,122), respectively. Although NPDS data do not provide information showing a definite link between exposures and COVID-19 cleaning efforts, there appears to be a clear temporal association with increased use of these products.

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Antimicrobial agents and chemotherapy 20APR2020	Nafamostat mesylate blocks activation of SARS-CoV-2: New treatment option for COVID-19	Hoffmann, Markus et al, Germany https://doi.org/10.1128/AAC.00754-20	Therapeutic	<p>The SARS-24 CoV-2 spike protein (S) is inserted into the viral envelope and mediates viral entry into cells. For this, the S protein depends on the cellular enzyme transmembrane protease serine 2 (TMPRSS2), which cleaves and thereby activates the S protein. Serine protease inhibitors gabexate mesylate (FOY), nafamostat mesylate (Futhan) along with camostat mesylate were tested for inhibition of SARS-CoV-2 infection of lung cells. All compounds are approved for human use in Japan.</p> <p>Gabexate mesylate slightly inhibited SARS-CoV-2 S-driven host cell entry while camostat mesylate robustly suppressed entry. Notably, nafamostat mesylate, which is FDA-approved for indications unrelated to coronavirus infection, inhibited SARS-CoV-2 S-mediated entry into host cells with roughly 15-fold higher efficiency than camostat mesylate, with an EC50 in the low nanomolar range. Moreover, nafamostat mesylate blocked SARS-CoV-2 infection of human lung cells with markedly higher efficiency than camostat mesylate while both compounds were not active against vesicular stomatitis virus infection, as expected.</p>
J of Emerg Microb and Inf 20APR2020	Different longitudinal patterns of nucleic acid and serology testing results based on disease severity of COVID-19 patients	Yongchen et al., China https://www.tandfonline.com/doi/full/10.1080/22221751.2020.1756699	Diagnostic	<p>-> Detailed timeline of nucleic acid testing results for throat or anal samples along with the anti-SARS-CoV-2 IgM and IgG responses in 21 individuals infected with SARS-CoV-2, including 11 non-severe COVID-19 patients, 5 severe COVID-19 patients and 5 asymptomatic carriers.</p> <p>-> Seroconversion was observed in 100% (17/17) of symptomatic patients during the observation period</p> <p>-> Did not identify a strong association of seroconversion and disease severity in our cohort</p>
Metabolism: clinical and experimental 19APR2020	Obesity as a risk factor for greater severity of COVID-19 in patients with metabolic associated fatty liver disease	Zheng, Kenneth I and al China https://www.sciencedirect.com/science/article/pii/S0026049520301086	Clinic	<p>Sixty six COVID-19 patients with metabolic associated fatty liver disease (MAFLD)</p> <p>n=45 with Body mass index (BMI) > 25 and n=21 with BMI < 25 Mean age :47 years and 74,2% female</p> <p>Results : BMI > 25 was related to more severe COVID 19 (adjusted-OR 6.32 95%CI 1.16 -34.54, p=0.033) even after adjusting for age, sex, smoking, diabetes, hypertension, and dyslipidaemia</p>
Clin Inf Dis 19APR2020	Profile of RT-PCR for SARS-CoV-2: a preliminary study from 56 COVID-19 patients	Xiao et al., China https://academic.oup.com/cid/article/doi/10.1093/cid/ciaa460/5822175	Diagnostic	<p>Dynamics profile of SARS-CoV-2 from 56 recovered COVID-19 patients</p> <p>-> Virus shedding was up to 6 weeks after onset of symptoms</p> <p>-> Longest duration between RT-PCR test for SARS-CoV-2: 42 days after onset of symptoms.</p> <p>-> Median duration between onset of symptom to nucleic acid conversion: 24 days</p> <p>-> In first 3 weeks after symptoms onset, majority results of RT-PCR for SARS-CoV-2 were positive. From week 3 after symptoms onset, number of negative RT-PCR results increased.</p> <p>-> The positive rate of RT-PCR test results was highest at week 1 (100%), followed by 89.3%, 66.1%, 32.1%, 5.4% and 0% at week 2, week 3, week 4, week 5 and week 6 respectively.</p>
Clinical Therapeutic 19APR2020	Association between clinical manifestations and prognosis in patients with COVID-19	Yu T and al, China https://doi.org/10.1016/j.clinthera.2020.04.009	Clinic	<p>Multicenter study – 95 patients COVID-19+</p> <p>73 had pneumonia (CT findings), significantly:</p> <ul style="list-style-type: none"> - Older - Higher BMI, ASAT and LDH levels - Lower lymphocyte and platelet count <p>ARDS (n=24) and non-ARDS (n=71)</p> <p><u>Independent risk factors associated with ARDS:</u></p> <ul style="list-style-type: none"> - High systolic blood pressure (OR:1.04, p=0.025) - High LDH level (OR:1.01, p=0.021) <p><u>Association with pneumonia exacerbation (n=19):</u></p> <ul style="list-style-type: none"> - High BMI (OR: 1.28, p=0.017) - Tobacco smoking (OR: 16.13, p=0.032) <p><u>Limitations:</u> exacerbation based on CT scan findings</p>

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Clin Inf Dis 19APR2020	Antibody Detection and Dynamic Characteristics in Patients with COVID-19	Xiang et al., China https://academic.oup.com/cid/article/doi/10.1093/cid/ciaa461/5822173	Diagnostic	<p>ELISA based on the recombinant nucleocapsid protein of SARS-CoV-2 Seroconversion of specific IgM and IgG antibodies were observed as early as the 4th day after symptom onset.</p> <p>In confirmed patient: IgM: Sensitivity, 77.3% Specificity, 100% PPV, 100% NPV, 80.0% Consistency rate : 88.1% IgG: Sensitivity, 83.3.3% Specificity, 95.0% PPV, 94.8% NPV, 83.8% Consistency rate : 88.9 %</p> <p>In patients with suspected COVID-19, sensitivity, specificity, PPV, NPV, and consistency rate of IgM were 87.5% (21/24), 100%, 100%, 95.2%, and 96.4%, and those of IgG were 70.8% (17/24), 96.6%, 85.0%, 89.1%, and 88.1%.</p> <p>-> Both antibodies performed well in serodiagnosis for COVID-19 rely on great specificity.</p>
Med 18APR2020	Efficacy and safety of lopinavir/ritonavir or arbidol in adult patients with mild/moderate COVID-19: an exploratory randomized controlled trial	Li, Y et al, China https://marlin-prod.literatumonline.com/pb-assets/products/coronavirus/MEDJ1.pdf	Therapeutics	<p>Exploratory randomized (2:2:1) controlled trial assessing the efficacy and safety of lopinavir/ritonavir (LPV/r) or arbidol monotherapy for treating patients with mild/moderate COVID-19. 86 patients with mild/moderate COVID-19 enrolled.</p> <p>LPV/r and arbidol did not shorten the time of positive-to-negative conversion of COVID-19 nucleic acid in respiratory specimens (9.0 vs. 9.1 vs. 9.3 days), nor did they improve the symptoms of COVID-19 or pneumonia on lung CT imaging at 7 days and 14 days. More patients treated with LPV/r progressed from mild/moderate to severe/critical status than patients from the other two groups. Adverse events occurred in the treatment groups.</p> <p>Limitations: small sample size, no severely or critically ill patients, or patients at increased risk of poor outcome with many comorbidities, not completely blinded.</p> <p>Controls: 10 family members 10 kidney transplant patients + COVID-19 pneumonia:</p> <ul style="list-style-type: none"> - Classical symptoms: fever, cough, shortness of breath, - 100%: lymphopenia and elevated CRP - 50% had temporally increase of serum creatinine - Abnormalities on chest CT scan - 8/10 were severe or critical cases and 1 died <p>Versus controls:</p> <ul style="list-style-type: none"> - Transplants patients more severe - Much longer time to become negative for SARS-CoV-2 (median time: 28,4 d) - Reduce fatal severe pneumonia: suppressing the hyperimmune response
European urology 18APR2020	Coronavirus Disease 2019 Pneumonia in Immunosuppressed Renal Transplant Recipients: A Summary of 10 Confirmed Cases in Wuhan, China	Zhu L and al, China http://www.sciencedirect.com/science/article/pii/S0302283820302141	Clinic	<p>Controls: 10 family members 10 kidney transplant patients + COVID-19 pneumonia:</p> <ul style="list-style-type: none"> - Classical symptoms: fever, cough, shortness of breath, - 100%: lymphopenia and elevated CRP - 50% had temporally increase of serum creatinine - Abnormalities on chest CT scan - 8/10 were severe or critical cases and 1 died <p>Versus controls:</p> <ul style="list-style-type: none"> - Transplants patients more severe - Much longer time to become negative for SARS-CoV-2 (median time: 28,4 d) - Reduce fatal severe pneumonia: suppressing the hyperimmune response
Science 17APR2020	Comparative pathogenesis of COVID-19, MERS, and SARS in a nonhuman primate model	Rockx, Barry; et al. Netherlands https://doi.org/10.1126/science.abb7314	Fundamental research	<p>Cynomolgus macaques inoculated with SARS-CoV-2 or MERS-CoV.</p> <ul style="list-style-type: none"> - SARS-CoV-2 causes COVID-19-like disease in macaques: virus excreted from nose and throat in the absence of clinical signs, detected in type I and II pneumocytes in foci of diffuse alveolar damage and in ciliated epithelial cells of nasal, bronchial, and bronchiolar mucosae. - lung lesions typically more severe with SARS-CoV-2 than in MERS-CoV infection, where virus was detected mainly in type II pneumocytes. <p>-> Cynomolgus macaques provide a new infection model to test preventive and therapeutic strategies.</p>

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J Thromb Haemost 17APR2020	The procoagulant pattern of patients with COVID-19 acute respiratory distress syndrome	Ranucci M and al, Italy https://doi.org/10.1111/jth.14854	Clinic	<p>16 patients COVID-19 pneumonia and ARDS in ICU 94% were male and 31% were obese D-Dimer, IL-6 and fibrinogen = higher than upper limit Association between IL-6 and fibrinogen levels Clot firmness higher than normal <u>Follow-up:</u> - Significant decrease of D-dimere and fibrinogen - Significant prolongation of the aPTT Pro-coagulant profile of COVID-19 ARDS patients and its normalization after an increased thromboprophylaxis. <u>Limitation:</u> lack of data on thrombin generation and fibrinolysis. Further studies: best prophylaxis and treatment ?</p>
Circulation research 17APR2020	Association of Inpatient Use of Angiotensin Converting Enzyme Inhibitors and Angiotensin II Receptor Blockers with Mortality Among Patients With Hypertension Hospitalized With COVID-19	Zhang, Peng et al, China https://doi.org/10.1161/CIRCRESAHA.120.317134	Therapeutics	<p>Retrospective, multi-center study including 1128 adult patients with hypertension diagnosed with COVID-19, including 188 taking ACEI/ARB (ACEI/ARB group; median age 64 [IQR 55-68] years; 53.2% men) and 940 without using ACEI/ARB (non-ACEI/ARB group; median age 64 [IQR 57-69]; 53.5% men).</p> <p>Among hospitalized COVID-19 patients with hypertension, inpatient use of ACEI/ARB was associated with lower risk of all-cause mortality compared with ACEI/ARB non-users.</p> <p>Limitations: hospital only, modest sample size, retrospective study.</p>
Gut 17APR2020	Covid-19 and immunomodulation in IBD	Neurath, Germany https://gut.bmj.com/content/early/2020/04/16/gutjnl-2020-321269	Immunology	<p>Results/ recommendations:</p> <ul style="list-style-type: none"> · No evidence for an increased risk or aggravated outcomes in patients with IBD in the context of covid-19 · However, covid-19 risks situation comprise older patients with IBD with comorbidities as well as patients suffering from malnutrition · Experimental covid-19 treatment with hydroxychloroquine or remdesivir may increase the risks for drug-drug interactions with established IBD medications. · Currently available recommendations for patients with IBD are : <ul style="list-style-type: none"> o Continue current treatment if disease is stable and discuss suitable medicine if disease has flared o Use of mesalamine should be continued and should not increase the risk of infection. o Corticosteroid use can be continued, but be cautious of possible side effects. o A new prescription of immunosuppressant or increase in dose of an ongoing immunosuppressant is not recommended in epidemic areas. o Use of biologics such as the antitumour necrosis factors infliximab or adalimumab should be continued. o If infliximab infusion is not accessible, switching to adalimumab injection at home should be considered. o Vedolizumab use can be continued due to the specificity of the drug for the intestine. o Ustekinumab use can be continued, but starting ustekinumab requires infusion centre visits and therefore should be discussed before initiation of therapy. o Enteral nutrition might be used if biologics are not accessible o Tofacitinib should not be newly prescribed in epidemic areas unless there are no other alternatives.
Nature Biotechnology 16APR2020	CRISPR-Cas12-based detection of SARS-CoV-2	Broughton, James P. and al. USA https://doi.org/10.1038/s41587-020-0513-4	Diagnostic	<p>Development of a rapid (<40 min), easy-to-implement and accurate CRISPR-Cas12-based lateral flow assay for detection of SARS-CoV-2 from respiratory swab RNA extracts.</p> <p>Validation using contrived reference samples and clinical samples, including 36 patients with COVID-19 infection and 42 patients with other viral respiratory infections.</p> <p>The CRISPR-based DETECTR assay provides a visual and faster alternative to SARS-CoV-2 real-time RT-PCR assay, with 95% positive predictive agreement and 100% negative predictive agreement.</p>

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NEJM 16APR2020	Not a Perfect Storm — Covid-19 and the Importance of Language	Brandt M. et al., USA https://doi.org/10.1056/NEJMp2005032	HSS/Politic	<p>Metaphors we use to describe disease shape our experience of illness : has an impact on the approach taken against the Covid => misguiding our approach. Covid characterized as a "perfect storm"="fierce storm arising from a rare combination of adverse meteorological factors"</p> <p>(randomness/volatility => reactive, disempowering). Vs developing and implementing preventive strategies to prepare for pandemics</p> <p>What is the impact of the language facing Pandemics? - The use of language eludes important conversation about our responsibility for emerging zoonoses + effects on the most vulnerable people. - The force of language minimizes our capacity to anticipate and prevent the next epidemics: long term investments in disease tracking and surveillance, scientific research and public health infrastructure</p> <p>Conclusion: Covid is not a simple natural event. It is also the result of human actions. => Be conscientious about our language and its implications as a first step for reforms and preventive measures to strengthen our health infrastructure to face future disease outbreaks.</p>
Cell 16APR2020	Development of CRISPR as an antiviral strategy to combat SARSCoV-2 and influenza	Abbott, T et al, USA https://www.cell.com/pb-assets/products/coronavirus/CELL_CELL-D-20-00736.pdf	Therapeutics	<p>A CRISPR-Cas13-based strategy, PAC-MAN (Prophylactic Antiviral CRISPR in huMAN cells), for viral inhibition can effectively degrade RNA from SARS-CoV-2 sequences and live influenza A virus (IAV) in human lung epithelial cells. CRISPR RNAs (crRNAs) targeting conserved viral regions were designed and screened, and functional crRNAs targeting SARS-CoV-2 were identified. The bioinformatic analysis showed a group of only six crRNAs can target more than 90% of all coronaviruses.</p> <p>With the development of a safe and effective system for respiratory tract delivery, PAC-MAN has the potential to become an important pan-coronavirus inhibition strategy.</p>
Plos One 16APR2020	Mental health problems and social media exposure during COVID-19 outbreak	Gao et al., China https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0231924	Psy	<p>Social media exposure (SME) +++ during Covid-19. Study on 4872 participants from 31 provinces and autonomous region -> High prevalence of mental health problems -> frequently SME was positively associated with high odds of anxiety (OR = 1.72, 95%CI: 1.31–2.26) and combination of depression and anxiety (CDA) (OR = 1.91, 95%CI: 1.52–2.41) compared with less SME.</p> <p>-> Need to combat with "infodemic" while combating during public health emergency</p>
International journal of antimicrobial agents 16APR2020	Can post-exposure prophylaxis for COVID-19 be considered as one of outbreak response strategies in long-term care hospitals?	Lee, Sun Hee et al, Republic of Korea https://doi.org/10.1016/j.ijantimicag.2020.105988	Therapeutics	<p>After a large COVID-19 exposure event in a long-term care hospital (LTCH) in Korea, PEP using hydroxychloroquine (HCQ) was conducted to 211 persons including 189 patients and 22 careworkers, with baseline negative PCR tests for COVID-19 (oral, dose of 400mg daily until the completion of 14 days of quarantine).</p> <p>=> PEP was completed in 184 (97.4%) patients and 21 (95.5%) careworkers without serious adverse events. => At the end of 14 days of quarantine, follow-up PCR tests were all negative.</p> <p>Limitations: - no control group. - 92 hospital staff showed negative results by RT-PCR after 14-day quarantine even though they did not receive PEP, however this group was considered at low risk exposure.</p>

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Respiratory Research 15APR2020	Prognostic value of NT-proBNP in patients with severe COVID-19	Gao L and al, China https://doi.org/10.1186/s12931-020-01352-w	Clinic	<p>54 patients – 2 groups: high and low NT-proBNP NT-proBNP at admission</p> <p>High group significantly:</p> <ul style="list-style-type: none"> - Older - More comorbidities - Pro inflammatory - Lymphopenia - Higher risk of death <p>Cut-off of NT-proBNP for predicting in hospital death: 88,64 pg/ml (sensitivity: 100% - specificity: 66,67%) AUC for in hospital death = 0,909</p> <p>NT-proBNP = independent risk factors for in hospital death (after adjusting)</p>
ACS nano 15APR2020	Rapid Detection of COVID-19 Causative Virus (SARS-CoV-2) in Human Nasopharyngeal Swab Specimens Using Field-Effect Transistor-Based Biosensor	Seo, Giwan and al Rep of Korea https://doi.org/10.1021/acsnano.0c02823	Diagnostic	<p>Technology based on a field-effect transistor (FET)-based biosensing device for detecting SARS-CoV-2 in clinical samples. The sensor was produced by coating graphene sheets of the FET with a specific antibody against SARS-CoV-2 spike protein.</p> <p>The performance of the sensor was determined using antigen protein, cultured virus, and nasopharyngeal swab specimens from COVID-19 patients.</p> <p>CI^o: the device is a highly sensitive immunological diagnostic method for COVID-19 that requires no sample pretreatment or labeling.</p>
Nature Medicine 15APR2020	Temporal dynamics in viral shedding and transmissibility of COVID-19	He, Xi; et al. China https://doi.org/10.1038/s41591-020-0869-5	Virology	<p>Pemporal viral shedding (94 patients with lab-confirmed COVID-19) and modeling of COVID-19 infectiousness profiles (separate 77 infector–infectee transmission pairs):</p> <ul style="list-style-type: none"> - highest viral load in throat swabs was at the time of symptom onset. - 44% of secondary cases were infected during the infectors' presymptomatic stage, in settings with substantial household clustering, active case finding and quarantine outside the home. <p>-> control measures should be adjusted to account for substantial presymptomatic transmission.</p>
Journal of Biomolecular Structure and Dynamics 15APR2020	Reverse vaccinology approach to design a novel multi-epitope vaccine candidate against COVID-19: an in silico study	Maryam Enayatkhani et al. Iran https://doi.org/10.1080/07391102.2020.1756411	Vaccine	<p>3 known antigenic proteins of SARS-CoV-2 (Nucleocapsid, ORF3a, and Membrane protein)</p> <p>-> used to predict <i>in silico</i> the potential immunogenic B and T-cell epitopes.</p> <p>-> Prediction of best tertiary structure of selected epitopes docking TLR4 and HLA-A + Evaluation of the end the stability of complex of these receptors with the selected epitopes , by molecular Dynamic simulation methods.</p> <p>Antigenicity of the designed antigenic sequence -> predicted by bioinformatic methods.</p> <p>The designed protein sequences without adjuvant were sufficient to produce an immune response. The allergenicity of the sequence was also predicted and this vaccine was not recognized as an allergen. As a conclusion, the engineered epitope could be considered as a possible vaccine candidate against COVID-19</p>
Nat Med 15APR2020	Temporal dynamics in viral shedding and transmissibility of COVID-19	He et al., China https://www.nature.com/articles/s41591-020-0869-5	Public Health/Epidemiology	<p>94 COVID-19 patients:</p> <ul style="list-style-type: none"> - Highest Viral loads in Throat swabs at time of symptom onset - Estimation: 44% (95% confidence interval, 25–69%) of secondary cases were infected during the index cases' presymptomatic stage <p>-> Infectiousness started from 2.3 days (95% CI, 0.8–3.0 days) before symptom onset and peaked at 0.7 days (95% CI, –0.2–2.0 days) before symptom onset</p>

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ACS nano 14APR2020	Computational Design of ACE2-Based Peptide Inhibitors of SARS-CoV-2	Han, Yanxiao et al, USA https://doi.org/10.1021/acsnano.0c02857	Therapeutics	<p>Design of peptide inhibitors against the SARS-CoV-2, mostly formed by two sequential self-supporting alpha-helices (bundle) extracted from the protease domain (PD) of angiotensin-converting enzyme 2 (ACE2), which bind to the SARS-CoV-2 receptor binding domains.</p> <p>Molecular dynamics simulations revealed that the alpha-helical peptides maintain their secondary structure and provide a highly specific and stable binding (blocking) to SARS-CoV-2. To provide a multivalent binding to the SARS-CoV-2 receptors, many such peptides could be attached to the surfaces of nanoparticle carriers.</p> <p>The proposed peptide inhibitors could provide simple and efficient therapeutics against the COVID-19 disease.</p>
Kidney International 14APR2020	Renal histopathological analysis of 26 postmortem findings of patients with COVID-19 in China	Su et al., China https://www.kidney-international.org/article/S0085-2538(20)30369-0/fulltext	Clinic	<p>Analyzing kidney abnormalities in 26 autopsies -> Patients: respiratory failure associated with multiple organ dysfunction syndrome as the cause of death.</p> <p>9/26: <u>clinical signs</u> of kidney injury that included increased serum creatinine and/or new-onset proteinuria.</p> <p><u>Light microscopy</u>: diffuse proximal tubule injury with loss of brush border, non-isometric vacuolar degeneration, and even frank necrosis. + Occasional hemosiderin granules and pigmented casts. + Prominent erythrocyte aggregates obstructing the lumen of capillaries without platelet or fibrinoid material. + Absence of evidence of vasculitis, interstitial inflammation or hemorrhage.</p> <p><u>Electron microscopic</u>: clusters of coronavirus particles with distinctive spikes in the tubular epithelium and podocytes.</p> <p>ACE2 was found to be upregulated in patients with COVID-19, and immunostaining with SARS-CoV nucleoprotein antibody was positive in tubules.</p>
Journal of Autoimmunity 14APR2020	Assessing ACE2 expression patterns in lung tissues in the pathogenesis of COVID-19	Li, Guoping; et al. China https://doi.org/10.1016/j.jaut.2020.102463	Fundamental research	<p>Data mining analysis (6 independent studies) of ACE2 expression in healthy population compared to patients with underlying diseases (chronic obstructive pulmonary diseases, asthma patients, smokers) :</p> <ul style="list-style-type: none"> - no difference in ACE2 lung expression in healthy vs patients with chronic airway disease, suggesting no difference in susceptibility to SARS-CoV-2 infection. - long-term smokers have significantly greater ACE2 expression than healthy non-smokers (small airway epithelium), suggesting a risk factor for COVID-19. - ACE2 expression dramatically increased between 12-24h post SARS-CoV infection (airway epithelial cells), suggesting a role of ACE2 in post-infectious regulation. <p>- In SARS-CoV infected cells, ACE2 expression significantly correlated with activation of neutrophils, NK cells, Th17 cells, Th2 cells, Th1 cells, dendritic cells and production of IL-1, IL-10, IL-6 and IL-8 (healthy non-smokers).</p> <p>Protein-protein regulation networks before and after infection identify:</p> <ul style="list-style-type: none"> - ribosomal protein RPS3 plays a key role in viral replication. - non-receptor protein kinase SRC has a role in macrophage mediated innate immunity and cytokine release. <p>Working hypothesis -> SARS-CoV-2 infection increases ACE2 expression, which affects RPS3 and SRC activity, two key hub genes involved in viral replication and inflammatory responses.</p>

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Disaster medicine and public health preparedness 14APR2020	Public Education and Electronic Awareness of the New Coronavirus (COVID-19): Experiences from Iran	Peyravi, M. et al, Iran https://doi.org/10.1017/dmp.2020.94	HSS/Politic	<p>When WHO declared a global health emergency, the Iranian Red Crescent Society and Ministry of Health took measures for public awareness (13 measures).</p> <ul style="list-style-type: none"> - Training on preventive measures and how to deal with infection and exposure to patients are the most important steps to cope with COVID-19. - Take into account : new educational technologies and applications and the capacity of national and private media. - Necessity to develop content related to the individuals' ages. Adapt also to illiterate and disabled. - Messages adapted to certain special public groups (drivers, bakeries, ...) or social activities (shopping, ...) more impactful than some general advice. <p>In the cyberspace</p> <ul style="list-style-type: none"> - Effective and timely use of cyberspace=> acceptance and dissemination - Better effectiveness of E-training than ordinary training. - Infographics (humor, animation and kids-friendly themes) viewed more and possibly higher effectiveness than monolog lectures. - Exponential growth in sharing the materials <p>Conclusion : to manage the virus, policymakers /organizations should provide innovative, unified and applied educational content to all people.</p>
BMJ 14APR2020	COVID-19: why we need a national health and social care service	Pollock, A. et al, UK https://doi.org/10.1136/bmj.m1465	HSS/Politic	<p>Social services in the UK: most privatized and fragmented in Western world.</p> <p>High proportion of NHS workforce currently off work+pay very low. Sector short 120 000 workers. Emergency legislation in the UK curtailed rights to social care services of elderly, ill and disabled people in community/residential settings contrary to international law and common sense.</p> <p>Lack of access to, i.e., support after hospital discharge or mental health services: => more health crises & hospital admissions + essential care workers taking time off to care for family members.</p> <p>Conclusion: Universal integrated health and social care service => bring all services and staff under government control.</p> <p>=> social care delivered by a trained and properly equipped workforce with decent terms of service. + mandate collection of data quantifying effect of COVID on social care sector.</p>
Ear, nose, & throat journal 13APR2020	Clinical Presentation of COVID-19: A Systematic Review Focusing on Upper Airway Symptoms	Lovato A and al, Italy https://doi.org/10.1177/0145561320920762	Clinic	<p>5 retrospective studies and cohort studies Quality of evidence = level 4 (low) 1556 patients: 57,5% males Mortality: 2,4% - ICU admission: 7,3% <u>Upper airways symptoms:</u></p> <ul style="list-style-type: none"> - Pharyngodynia: 12,4% - Nasal congestion: 3,7% - Rhinorrhea: 4% (1 study) <p>None of the studies reported olfactory or gustative dysfunction</p> <p>Rest symptoms: same other study (fever, cough, fatigue) Alteration chest CT: 83% → bilateral++++ Severe cases: older, lymphopenia, radiologic abnormalities <u>Limits:</u> only hospitalized patients → not full clinical spectrum of COVID-19 / olfactory disorders could have been underestimated</p>

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Mayo Clinic Proceedings 13APR2020	ST-segment Elevation, Myocardial Injury, and Suspected or Confirmed COVID-19 Patients: Diagnostic and Treatment Uncertainties	Bennett et al., USA https://doi.org/10.1016/j.jacc.2020.04.005	Diagnostic	-> For patients with COVID-19, the evaluation can be challenging due to reports of STE without obstructive coronary disease, which creates diagnostic and management challenges -> Institutions to define acute cardiac care pathways which balance the risks of complicating COVID-19 patients from invasive therapies and unnecessary contrast exposure versus the potential benefit if the patient is experiencing a MI from acute coronary occlusion
International Forum of Allergy & Rhinology 12APR2020	Association of chemosensory dysfunction and Covid-19 in patients presenting with influenza-like symptoms	Carol Y and al, USA https://doi.org/10.1002/air.22572	Clinic	Cross sectional study – question survey – 2 groups All with influenza like symptoms 59 COVID-19 positive and 203 COVID-19 negative Hospital admission low and comparable between groups Smell and taste loss: more frequent in COVID-19 group - 68% and 71% versus 16% and 17% respectively - Largest magnitude of association with COVID-19 Independently associated with COVID-19: - Anosmia: OR 10,9 [5,08 – 23,5] - Taste: OR 10,2 [4,74 – 22,1] Improvement of olfaction and taste that correlated with clinical resolution of illness.
Travel Med. Infect. Dis. 11APR2020	Clinical and microbiological effect of a combination of hydroxychloroquine and azithromycin in 80 COVID-19 patients with at least a six-day follow up: A pilot observational study	Gautret, Philippe et al, France https://doi.org/10.1016/j.tmaid.2020.101663	Therapeutic	Uncontrolled non-comparative observational study in a cohort of 80 relatively mildly infected inpatients treated with a combination of hydroxychloroquine and azithromycin over a period of at least three days. All patients improved clinically except one 86 year-old patient who died, and one 74 year-old patient still in intensive care. A rapid fall of nasopharyngeal viral load was noted, with 83% negative at Day7, and 93% at Day8. Virus cultures from patient respiratory samples were negative in 97.5% of patients at Day5. Limitations: descriptive pilot study in only 80 patients with relatively mild clinical presentation. No analytic approach to account for possible confounds including notably the severity of illness.
The Lancet 11APR2020	Centring sexual and reproductive health and justice in the global COVID-19 response	Matthew J Harris et al., UK https://doi.org/10.1016/S0140-6736(20)30801-1	HSS/Politic	COVID-19 + existing sexual & reproductive health inequities => women, girls and vulnerable populations' health, wellbeing and economic stability disproportionately impacted. 1) COVID-19 = Increased risks for women - Women's risk factors of contracting COVID-19 may be higher = 70% of the global health and social care workforce worldwide, - Potential pregnancy-related complications 2) Impact on sexual/reproductive health care - Disruption/Diversion of resources away from essential sexual/reproductive health care for COVID - Restrictive global policies that target vulnerable populations (Protecting Life in Global Health Assistance + migration policies of deterrence) Solutions: - Additional resources for sexual/reproductive health care + increase of telemedicine - Sex-disaggregated mortality and morbidity surveillance for COVID-19 research - Community driven efforts: recognize inequitable power structures + collaborative response - Eliminate legal/policy restrictions to sexual/reproductive health care.

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Journal of Clinical Virology 11APR2020	Dynamic profile of RT-PCR findings from 301 COVID-19 patients in Wuhan, China: a descriptive study	Xiao et al., China https://www.sciencedirect.com/science/article/pii/S1386653220300883?via%3Dihub	Diagnostic	301 patients: -> median period between symptoms presence and positive SARS-CoV-2 RT-PCR results was 16 days -> median period between symptoms presence and an effective negative SARS-CoV-2 RT-PCR result was 20 days Although two consecutive negative results were confirmed in 70 patients, 30% of them had positive viral test results for the third time. Using specimens from nasal swabs to run the RT-PCR test showed a higher positive rate than using specimens from throat swabs.
Science 10APR2020	Structure of the RNA-dependent RNA polymerase from COVID-19 virus	Gao, Yan; et al. China - Australia https://doi.org/10.1126/science.abb7498	Structural biology	Cryo-EM structure of SARS-CoV-2 full-length RNA-dependent RNA polymerase (RdRp, also named nsp12) in complex with cofactors nsp7 and nsp8 (2.9-Å resolution) reveal: - Conserved architecture of nsp12 with polymerase core of SARS-CoV, and resolution of a newly identified β -hairpin domain at its N terminus. - Comparative modeling reveals how remdesivir binds to nsp12 polymerase, its primary antiviral drug target. -> provides basis for design of new antiviral therapeutics /cocktails targeting viral RdRp (nsp12).
Emerg. Infect. Dis. 10APR2020	Aerosol and Surface Distribution of Severe Acute Respiratory Syndrome Coronavirus 2 in Hospital Wards, Wuhan, China, 2020	Zhen-Dong Guo; et al. China https://doi.org/10.3201/eid2607.200885	Virology	Samples taken from potentially contaminated objects and air from an ICU (housed 15 patients with severe COVID-19) and a general ward (housed 24 patients with milder COVID-19): - SARS-CoV-2 contamination greater in ICU than general ward. - Almost all positive samples concentrated in the contaminated areas. - Virus widely distributed on floors, computer mice, trash cans, sickbed handrails in both the ICU and general wards. - Virus-laden aerosols mainly concentrated near and downstream from patients, up to 4 m. -> Atricter protective measures should be taken by medical staff working in the ICUs than general wards. -> Aerosol distribution in the general ward indicate transmission distance of SARS-CoV-2 might be 4 m
NEJM 10APR2020	Compassionate Use of Remdesivir for Patients with Severe Covid-19	Grein, Jonathan et al, USA https://doi.org/10.1056/NEJMoa2007016	Therapeutic	63 compassionate use of remdesivir for COVID patients with either an oxygen saturation of 94% or less while breathing ambient air or need for oxygen support: 40 patients (75%) received the full 10-day course of remdesivir, 10 (19%) received 5 to 9 days of treatment, and 3 (6%) fewer than 5 days of treatment. During a median follow-up of 18 days, 36 patients (68%) had an improvement in oxygen-support class , including 17 of 30 patients (57%) receiving mechanical ventilation who were extubated. A total of 25 patients (47%) were discharged, and 7 patients (13%) died Point of attention : Measurement of efficacy will require ongoing randomized, placebo-controlled trials
Journal of Clinical Virology 10APR2020	Clinical characteristics and risk assessment of newborns born to mothers with COVID-19	Yang, Pu et al Chine https://doi.org/10.1016/j.jcv.2020.104356	Clinic	Case report of 7 newborns delivered by SARS-CoV-2 infected pregnant women The current data show that the infection of SARS-CoV-2 in late pregnant women does not cause adverse outcomes in their newborns
Euro Surv 9APR2020	Excess cases of influenza-like illnesses synchronous with coronavirus disease (COVID-19) epidemic, France, March 2020	Boëlle, Pierre-Yves et al, France https://doi.org/10.2807/1560-7917.ES.2020.25.14.2000326	HSS/Politik	Comparison of data from the Sentinelles network monitors influenza-like illnesses (ILI) and acute respiratory infections (ARI) in general practice in France and official COVID 19 reported cases in early March 2020 from the Santé Publique France It is estimated that 760 (95% CrI: 219–1,706) of acute respiratory infections consultations in those older than 65 years in two regions of France (BFC and GRE) could have been caused by COVID-19 during week 10.

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Clinical infectious disease 9APR2020	Factors associated with prolonged viral RNA shedding in patients with COVID-19	Xu K and al, China https://doi.org/10.1093/cid/ciao351	Clinic	<p>Retrospective study – Two hospital – 113 patients Median age: 52 years – 58,4% were male 28,3% were diagnosed as severe illness Median hospital stays: 15 days 74,3% had viral RNA clearance within 21 days after illness onset (median: 15 days) Prolonged RNA shedding: - Male (p=0,009) - Old age (p=0,033) - Concomitant hypertension (p=0,009) - Invasive mechanical ventilation (p=0,006) - Use of corticosteroid (p=0,025) - Delay recovery on radiological image (p<0,001) → Multivariate analysis: - Male (OR: 3,24) - Delay hospital admission (OR: 1,30) - Invasive mechanical support Limitations: - Viral RNA shedding ≠ viral shedding - Didn't not evaluated the effect of the treatment</p>
Obesity 9APR2020	High prevalence of obesity in severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) requiring invasive mechanical ventilation	Simonnet A and al, France https://doi.org/10.1002/obv.22831	Clinic	<p>Retrospective study – 124 patients in ICU Control group: non-SARS-CoV2 in ICU Median age: 60 years – 73% male -15% died 68,6% required invasive mechanical ventilation (IMV) Obesity and severe obesity were significantly more frequent in SARS-CoV2 patients (p<0,001) Median BMI in SARS-CoV2 patients higher than in non-SARS-CoV2: 29,6 vs 24,0 (p<0,001) IMV vs non IMV: - BMI higher in IMV group: 31,1 vs 27,0 (p<0,001) Need for IMV gradually increase with BMI category. Patients with obesity should take extra measure to avoid COVID19 contamination.</p>
F1000 Research 9APR2020	In silico identification of vaccine targets for 2019-nCoV	Chloe H. Lee and Hashem Koohy UK https://doi.org/10.12688/f1000research.22507.1	Vaccine	<p>The authors define computationally identified immunogenic and/or cross-reactive peptides from 2019-nCoV, based on comparison with immunogenic peptides deposited in the Immune Epitope Database and Analysis Resource (IEDB). They found: i) 28 SARS-derived peptides having exact matches in 2019-nCoV proteome previously characterized to be immunogenic by in vitro T cell assays (high affinity to HLA-A class I and II and targeted by CD8+ and CD4+ T cells) ii) 22 nCoV peptides having a high sequence similarity with immunogenic peptides but with a greater predicted immunogenicity score iii) 44 nCoV peptides predicted to be immunogenic by the iPred algorithm and 1G4 TCR positional weight matrices respectively (<i>de novo in silico</i> search of immunogenic peptides against the 2019-nCoV proteome sequence)</p>
Psychotherapy and psychosomatics 9APR2020	Mental Health and Psychosocial Problems of Medical Health Workers during the COVID-19 Epidemic in China	Hong-xing Wang et al., China https://doi.org/10.1159/000507639	Psy	<p>Method : online survey (2182 participants from China) Result : <ul style="list-style-type: none"> • higher prevalence rates of psychological symptoms among medical health workers = insomnia, anxiety, depression, somatization, and obsessive-compulsive symptoms • risk factors : having organic disease, living in rural areas, being female, and being at risk of contact with COVID-19 patients Main reasons : <ul style="list-style-type: none"> • insufficient understanding of the virus initially • lack of prevention and control knowledge • long-term workload • high risk of exposure to patients with COVID-19 • shortage of medical protective equipment, • lack of rest • exposure to critical life events, such as death. Need for : <ul style="list-style-type: none"> • health protection and adequate working conditions: lowering job demands and workload / increasing job control and reward, medical protective equipment, adequate rest... • recovery programs focused on resilience and psychological well-being </p>

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Clinical infectious diseases 9APR2020	Comparative replication and immune activation profiles of SARS-CoV-2 and SARS-CoV in human lungs: an ex vivo study with implications for the pathogenesis of COVID-19	Chu, Hin; et al. China https://doi.org/10.1093/cid/cia410	Virology	<p>Ex vivo human lung tissues infected with SARS-CoV-2 compared to SARS-CoV :</p> <ul style="list-style-type: none"> - SARS-CoV-2 infected and replicated in human lung tissues more efficiently, generating 3.20 folds more infectious virus particles within 48hrs. - Both viruses were similar in cell tropism: both targeting types I and II pneumocytes, and alveolar macrophages. <p>-> Despite a more efficient virus replication in the infected human lung tissue, SARS-CoV-2 did not significantly induce types I, II, or III interferons, and only upregulated 38 % (= IL6, MCP1, CXCL1, CXCL5, and CXCL10) of the 13 key inflammatory mediators tested (in contrast to 85 % for SARS-CoV).</p>
The Lancet. Global health 9APR2020	COVID-19 and risks to the supply and quality of tests, drugs, and vaccines	Paul N Newton et al., US https://doi.org/10.1016/S2214-109X(20)30136-4	HSS/Politic	<p>Production /supply chains for COVID-19 candidate drugs / essential medical products impaired. Supply chains for vital drugs for other diseases disrupted by repurposing without adequate evidence.</p> <ul style="list-style-type: none"> • Substandard drugs driven by cost reduction • Falsified agents thrive on shortages, especially when buyers depart from regulated supply chains (masks, diagnostic tests, false claim of treatments...). <p>When proven efficacious treatment, robust policies need to ensure prompt affordable, access for all people in need + quality assured, not diverted from other treatments:</p> <ul style="list-style-type: none"> • Coordinated information-sharing among medicine regulators on authorizations for clinical trials • Ensure global manufacture + investigational interventions for unregistered + off label use • Comprehensive/rapid reporting of shortages of active ingredients and finished products • Robust evaluation of diagnostic tests • Innovative regional mechanisms (e.g. African Vaccine Regulatory Forum) for nations without robust regulatory systems
NEJM 9APR2020	Disease Control, Civil Liberties, and Mass Testing — Calibrating Restrictions during the Covid-19 Pandemic	David M. Studdert et al., US https://doi.org/10.1056/NEJMo2007637	HSS/Politic	<p>Civil liberties: courts insist coercive restrictions must be 1) necessary, 2) crafted as narrowly as possible, 3) not used to target ostracized groups.</p> <p>Clear criteria for quarantine for other diseases don't apply to social restrictions for COVID-19:</p> <ol style="list-style-type: none"> 1) Quarantine is community-wide and applies to government and private actors; 2) Transmission dynamics make it difficult to identify / target risk groups. 3) Stay-at-home restrictions unlikely to be a one-shot deal => Need for a graduated approach to restrictive measures. <p>Curfew laws most adapted: courts give leeway to government to adapt + see COVID-19 restrictions as more of a public policy than a legal issue.</p> <p>Tailor restrictions using credible person-level information => identify people most likely to transmit infection through population wide program of testing and surveillance.</p> <p>Aggregate test results at community+state level to dial up or down.</p> <p>=>Federal, state and local governments to finance & oversee + rely on hospitals, pharmacies, private labs, mobile health services for implementation + civil organizations to foster compliance.</p>
Life Sciences 9APR2020	In silico studies on therapeutic agents for COVID-19: Drug repurposing approach	Shah, Bhumi et al, India https://doi.org/10.1016/j.lfs.2020.117652	Therapeutic	<p>61 molecules that are already being used in clinics or under clinical scrutiny as antiviral agents are surveyed via docking study.</p> <p>37 molecules were found to interact with >2 protein structures of COVID-19. Among them, HIV protease inhibitors and RNA-dependent RNA polymerase inhibitors showed promising features of binding to COVID-19 enzyme. Along with these, Methisazone an inhibitor of protein synthesis, CGP42112A an angiotensin AT2 receptor agonist and ABT450 an inhibitor of the non-structural protein 3-4A might become convenient treatment option as well against COVID-19.</p>

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EuroSur 9APR2020	An alternative workflow for molecular detection of SARS-CoV-2 – escape from the NA extraction kit-shortage, Copenhagen, Denmark, March 2020	Fomsgaard et al., Denmark https://www.eurosurveillance.org/content/10.2807/1560-7917.ES.2020.25.14.2000398	Diagnostics	<p>Development of an alternative simple and fast workflow for molecular detection of SARS-CoV-2 that does not require NA extraction and could serve as an alternative in diagnostic laboratories to overcome chemical-based kit-shortages.</p> <p>Approach consists of heating samples at 98°C for 5 min</p> <p>This simplified heat-approach should not be for general use but only if the gold standard approaches are not available. Simply heating the samples could serve as an easy, fast and inexpensive alternative to chemical extraction kits, which would detect 97.4% of the COVID-19-positive patients with no false positives; however, there might be a small risk of false negatives, which could be minimised by performing the assay in duplicates</p> <p>Overall, 208 patients were divided into stable group (n=168, 80.8%) and progressive group (n=40,19.2%) based on whether their conditions worsened during the hospitalization.</p>
Clin Inf Dis 9APR2020	Prediction for Progression Risk in Patients with COVID-19 Pneumonia: the CALL Score	Ji, Dong and al., China https://academic.oup.com/cid/advance-article/doi/10.1093/cid/ciaa414/5818317	Diagnostics	<p>Comorbidity, older age, lower lymphocyte and higher lactate dehydrogenase were shown to be independent high-risk factors for COVID-19 progression.</p> <p>By incorporating these 4 factors a novel scoring model, named as CALL, was established and tested.</p> <p>Conclusion : using the CALL score model can help the clinicians to improve the therapeutic effect and reduce the mortality of COVID-19 with more accurate and reasonable resolutions on medical resources.</p>
Clin Inf Dis 8APR2020	PCR Assays Turned Positive in 25 Discharged COVID-19 Patient	Yuan, Jing and al., China https://doi.org/10.1093/cid/ciaa398	Clinic	<p>172 COVID-19 infected patients discharged from Hospital:</p> <ol style="list-style-type: none"> (1) Normal body temperature for more than 3 consecutive days. (2) Significant reduction of respiratory symptoms evaluated by following indicators: cough and expectoration disappeared, normal ranges for inflammatory markers IL-6 and CRP, as well as oxygenation index ≥ 350. (3) Substantial improvement over conventional chest radiography detection. (4) At least two consecutively negative results of RT-PCR testing separated by at least 24-hour interval. <p>All discharged patients were required another 14 days of self-segregating at home for further observation.</p> <p>-> 25 discharged patients sent to hospital again because of the positive RT-PCR results. They experienced an average of 7.32 ± 3.86 days from their last negative RT-PCR result to turning positive again.</p> <p>Some immunological parameters such as D-dimer and absolute lymphocyte count, and even antibody test should be combined with RT-PCR negative test as additional measures to assure that infected patients have completely recovered and can be released from quarantine.</p>
Clinical Immunology 8APR2020	Epigenetic dysregulation of ACE2 and interferon-regulated genes might suggest increased COVID-19 susceptibility and severity in lupus patients	Sawalha, Amr H. et al. USA-China https://doi.org/10.1016/j.clim.2020.108410	Virology	<p>Patients with systemic lupus erythematosus might be especially prone to severe COVID-19, independent of their immunosuppressed state.</p> <ul style="list-style-type: none"> - ACE2 is hypomethylated and overexpressed in lupus T cells suggesting an increased susceptibility to SARS-CoV-2 infection. - increased oxidative stress induced by viral infection exacerbates ACE2 demethylation defect in lupus and may enhance viremia. <p>> Maintaining disease remission in lupus patients is critical to prevent DNA demethylation and increased oxidative stress, which may exacerbate susceptibility to SARS-CoV-2 infection and likelihood of cytokine storm.</p>

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JAMA pediatric 8APR2020	Screening and Severity of Coronavirus Disease 2019 (COVID-19) in Children in Madrid, Spain	Tagarro A and al, Spain https://doi.org/10.1001/jamaopediatrics.2020.134	Clinic.	365 screened children and 41 were positive = 11% Median age = 1 year 34% had upper respiratory tract infection – 127 % fever without source - 5% viral like pneumonia 60% were hospitalized and 9,7% were admitted to PICU and needed respiratory support No one died Limitations: probably more hospitalisation because of an increase awareness of COVID-19.
The Lancet 8APR2020	First-wave COVID-19 transmissibility and severity in China outside Hubei after control measures, and second-wave scenario planning: a modelling impact assessment	Leung et al., China https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)30746-7/fulltext?utm_campaign=twitter&utm_medium=social	Public Health/Epidemiology	-> The first wave of COVID-19 outside of Hubei has abated because of aggressive non-pharmaceutical interventions . -> the R_t decreased substantially since Jan 23, when control measures were implemented, and have since remained below 1. -> Relaxing the interventions (resulting in $R_t > 1$) when the epidemic size was still small would increase the cumulative case count exponentially as a function of relaxation duration , even if aggressive interventions could subsequently push disease prevalence back to the baseline level. Given the substantial risk of viral reintroduction, particularly from overseas importation, close monitoring of R_t and cCFR is needed to inform strategies against a potential second wave to achieve an optimal balance between health and economic protection.
The European respiratory journal, 8APR2020	Clinical characteristics and outcomes of hospitalised patients with COVID-19 treated in Hubei (epicenter) and outside Hubei (non-epicenter): A Nationwide Analysis of China	Wen-hua Liang et al, China https://doi.org/10.1183/13993003.00562-2020	Clinic	1590 cases from 575 hospitals in 31 provincial administrative regions were collected (core cohort). The overall rate of severe cases and mortality was 16.0% and 3.2%, respectively, but Potential risk factors analysed using proportional hazard (PH) Cox regression models Patients in Hubei [severe event rate 23.0% versus 11.1%, death rate 7.3% versus 0.3%, hazards ratio (HR) for critical illness 1.59, 95%CI 1.05–2.41] have a poorer prognosis compared with patients outside of Hubei after adjusting for age and comorbidity This might be attributed to the prolonged duration of symptom onset to hospitalization in the epicenter.
Journal of biomolecular structure & dynamics, 8APR2020	In-silico homology assisted identification of inhibitor of RNA binding against 2019-nCoV N-protein (N terminal domain)	Sarma, Phulen et al, India https://doi.org/10.1080/07391102.2020.1753580	Therapeutic	Two NTD structures of N proteins were selected (2OFZ and 1SSK, 92% homology) for virtual screening of 56,079 compounds from Asinex and Maybridge library to identify top 15 hits for each of the targets based on “docking score” This study suggests two important class of compounds, theophylline and pyrimidone derivatives as possible inhibitors of RNA binding to the N terminal domain of N protein of coronavirus, thus opening new avenues for in vitro validations
Pediatric Critical Care 7APR2020	Coronavirus Disease 2019 in Critically Ill Children: A Narrative Review of the Literature	Ong J and al, Singapore/Italy/Canada https://journals.lww.com/pccmjournal/Abstract/onlinefirst/Coronavirus_Disease_2019_in_Critically_Ill.98057.aspx	Clinic	Children account for a few proportions of COVID19 diseases Not severely ill: asymptomatic++++ or mild Infant under 1 year appear to have an increased risk of severe disease. <u>Spared from severe disease:</u> - Less lymphopenia: 3,5% ≠ 70% in adults, - Appear to be less pro-inflammatory than adults, - Variation of expression of ACE2 and activity with age could protect against lung injury. <u>Management:</u> - Noninvasive ventilation or high-flow nasal cannula would be preferred, - Intubation should be performed by experienced practitioner with PPE and rapid sequence induction - Useduffed tubes (minimized air leak), - Avoided disruption to the ventilator circuit - Creation of a family liaison contact

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The Lancet Public Health 07APR2020	The French response to COVID-19: intrinsic difficulties at the interface of science, public health, and policy	Moatti, Jean.P et al., France https://doi.org/10.1016/S2468-2667(20)30087-6	HSS/Politic	<p>French authorities appointed an advisory board of 11 scientists to help manage the crisis =>evidence-based policy but:</p> <ol style="list-style-type: none"> 1) France did not have logistic capacity to promote mass testing. Rather than setting goal of scaling up, authorities argued systematic testing was not needed; 2) Maintaining second round of elections # social science literature established disaster communication should avoid dissonant incentives/double binds. 3) Referring to clinical trials to prove efficacy of hydroxychloroquine without considering alternative evaluation methods for quicker evidence => reduced ability of authorities to mitigate effects or rumors and regulate prescription practices. Setting up second experts' committee: implicit recognition of the intrinsic difficulties of directly using science in political management of a health crisis.
J Mol Diag PRE-PROOF 7MAR2020	Development of Reverse Transcription Loop-mediated Isothermal Amplification (RT-LAMP) Assays Targeting SARS-CoV-2	Park et al., Republic of Korea https://www.biorxiv.org/content/10.1101/2020.03.09.983064v1	Diagnostic	<p>-> Development of highly specific RT-LAMP assays for detection of SARS-CoV-2.</p> <p>-> Results of these RT-LAMP assays can be detected within 30 minutes after amplification reaction begin. -> Optimization of reaction conditions where LCV colorimetric detection method is applied that can be used for point-of-care tests.</p>
Clinical infectious diseases 7APR2020	Towards Optimization of Hydroxychloroquine Dosing in Intensive Care Unit COVID-19 Patients	Perinel, Sophie et al, France https://doi.org/10.1093/cid/ciaa394	Therapeutic	<p>Prospective pharmacokinetic study : 13 patients in intensive care unit received 200 mg x 3 of oral HCQ daily, mean age 68 y. 46% obese, 31% with moderate or severe renal failure HCQ levels >1 mg/L and <2 mg/L were considered to be therapeutic. 161 blood levels recorded. Simulations performed based on data from patients with rheumatoid arthritis.</p> <p>PK studies are needed to define the optimal dosing regimen. Based on simulations, a loading dose of 800 mg once daily on day 1, followed by 200 mg twice daily for 7 days is proposed</p>
Science Translational Medicine 6APR2020	An orally bioavailable broad-spectrum antiviral inhibits SARS-CoV-2 in human airway epithelial cell cultures and multiple coronaviruses in mice	Sheahan, Timothy P. et al. USA https://doi.org/10.1126/scitranslmed.abb5883	Therapeutic	<p>In human airway epithelial cell cultures :</p> <ul style="list-style-type: none"> - Orally bioavailable ribonucleoside analog (NHC, EIDD-1931) has broad spectrum antiviral activity against SARS-CoV-2, MERS-CoV, SARS-CoV, and related zoonotic group 2b or 2c Bat-CoVs, and a coronavirus bearing resistance mutations to remdesivir. <p>In mice:</p> <ul style="list-style-type: none"> - Prophylactic and therapeutic administration improved pulmonary function, reduced virus titer and weight loss (mice infected with SARS-CoV or MERS-CoV) <p>-> potency of NHC/EIDD-2801 against multiple coronaviruses and oral bioavailability makes it a potential effective antiviral against SARS-CoV-2</p>
Journal of Medical Virology 6APR2020	Tocilizumab treatment in COVID-19: a single center experience	Luo, Pan et al, China https://doi.org/10.1002/jmv.25801	Therapeutic	<p>15 COVID-19 patients under Tocilizumab (TCZ) therapy were retrospectively assessed.</p> <ul style="list-style-type: none"> - TCZ treatment ameliorated the increased CRP in all patients rapidly, - The 4 critically ill patients who received an only single dose of TCZ -> 3 died and the CRP level in the rest one patient failed to return to normal range with a clinical outcome of disease aggravation. - Serum IL-6 level tended to further spiked firstly and then decreased after TCZ therapy in 10 patients. - Persistent and dramatic increase of IL-6 was observed in these 4 patients who failed treatment. <p>=> A single dose of TCZ seems to fail to improve the disease activity in critically ill patients although it was used in combination with glucocorticoid. However, repeated doses of TCZ might improve the condition of critically ill patients.</p> <p>Limitations: small number of cases reported ; use of laboratory parameters to define the disease activity is still challenging ; treatment duration observed may not be sufficient to make a final conclusion.</p>

Journal and date	Title	Authors and link	Field of expertise	Key facts
JAMA 6APR2020	Baseline Characteristics and Outcomes of 1591 Patients Infected With SARS-CoV-2 Admitted to ICUs of the Lombardy Region, Italy	Grasselli G et al, Italy https://doi.org/10.1001/jama.2020.5394	Clinic	Retrospective - 1591 patients COVID-19 – multicentric <u>Demographic:</u> - 82% male - median age: 63 years - 68% had at least 1 comorbidity (HTA+++) <u>Clinical data</u> - 1150 patients required mechanical ventilation (higher than reported for other ICU patients) - Median PEEP: 14 cmH₂O - Median P _{aO2} /F _{IO2} = 166 (IQR:114-220), higher in young patients (< 63 years) - Mortality: 26% , higher in older patients (15% vs 36%, p<0,001) - Median length of stay: 9 days in ICU <u>Limitation:</u> - Short follow up → mortality rate could change? - Missing data for some patients
Clin Chem 4APR2020	Potential false-negative nucleic acid testing results for Severe Acute Respiratory Syndrome Coronavirus 2 from thermal inactivation of samples with low viral loads	Pan et al., China https://academic.oup.com/clinchem/advance-article/doi/10.1093/clinchem/hvaa091/5815979	Diagnostic	-> Ct values are increased (higher threshold for detection) in specimens from diagnosed COVID-19 patients in RT-PCR tests after thermal incubation . -> About half of the weak-positive samples (7 of 15 samples, 46.7%) were RT-PCR negative after heat inactivation in at least one parallel testing Thermal inactivation adversely affected the efficiency of RT-PCR for SARS-CoV-2 detection. Given the limited applicability associated with chemical inactivators, other approaches to ensure the overall protection of laboratory personnel need consideration.
Inter J Of Infect Dis 3APR2020	A first Case of Meningitis/Encephalitis associated with SARS-Coronavirus-2	Moriguchi, Takeshi et al, Japan https://doi.org/10.1016/j.ijid.2020.03.062	Clinic	Case report : 23-year old male, with seizure accompanied by unconsciousness. The specific SARS-CoV-2 RNA was not detected in the nasopharyngeal swab but was detected in a CSF brain MRI : hyperintensity along the wall of right lateral ventricle and hyperintense signal changes in the right mesial temporal lobe and hippocampus, suggesting the possibility of SARS-CoV-2 meningitis Chest CT small ground glass opacities At D15 : still ventilated and with impaired consciousness This case warns the physicians of patients who have CNS symptoms.
The Journal of infection 3APR2020	Neutrophil-to-lymphocyte ratio as an independent risk factor for mortality in hospitalized patients with COVID-19	Liu et al., China https://www.journalofinfection.com/article/S0163-4453(20)30208-5/pdf	Clinic	245 COVID-19 patients : -> Multivariate analysis demonstrated that there was 8% higher risk of in-hospital mortality for each unit increase in NLR. -> Compared with patients in the lowest tertile, the NLR of patients in the highest tertile had a 15.04-fold higher risk of death after adjustment for potential confounders -> Fully adjusted OR for mortality was 1.10 in males for each unit increase of NLR NLR is an independent risk factor of the in-hospital mortality for COVID-19 patients especially for male.
The Journal of infection 3APR2020	Arbidol Monotherapy is Superior to Lopinavir/ritonavir in Treating COVID-19	Zhu, Zhen et al, China https://doi.org/10.1016/j.jinf.2020.03.060	Therapeutic	50 patients into 2 groups - lopinavir/ritonavir group (34 cases) - arbidol group (16 cases). Data from these patients were retrospectively analyzed . At D14 post admission: no viral load was detected in arbidol group. 44.1% of patients in lopinavir/ritonavir group had positive RNA test on day 14. Patients in the arbidol group had a shorter duration of positive RNA test. No apparent side effects were found in both groups. => Arbidol monotherapy may be superior to lopinavir/ritonavir in treating COVID-19. The sample size is the major limitation of this study.

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CELL preproof	Inhibition of SARS-CoV-2 infections in engineered human tissues using clinical-grade soluble human ACE2	Monteil, Kwon et al,	Therapeutic	ACE2 has now also been identified as a key receptor for SARS-CoV-2 infections and it has been proposed that inhibiting this interaction might be used in treating patients with COVID-19. Clinical grade human recombinant soluble ACE2 (hrsACE2) reduced SARS-CoV-2 recovery from Vero cells by a factor of 1,000-5,000 . An equivalent mouse rsACE2 had no effect. SARS-CoV-2 can also directly infect engineered human blood vessel organoids and human kidney organoids, which can be inhibited by hrsACE2. These data demonstrate that hrsACE2 can significantly block early stages of SARS-CoV-2 infections.
Nature Medicine 3APR2020	Respiratory virus shedding in exhaled breath and efficacy of face masks	Leung, Nancy H. L. et al., https://doi.org/10.1038/s41591-020-0843-2 China - USA	Virology	Detection of virus RNA shedding in exhaled breath and coughs of children and adults with acute respiratory illness (influenza (n=23-28 infected individuals), coronavirus (n=10-11) and rhinoviruses (n=36-32)). 5 µm particle size fractionation. <u>Without face mask:</u> - Viral RNA identified in 30%, 26% and 28% of respiratory droplets and 40%, 35% and 56% of aerosols collected while not wearing a face mask (coronavirus, influenza virus and rhinovirus-infected participants, respectively) Surgical face masks significantly reduced detection of viral RNA for: - Influenza virus in respiratory droplets, but not in aerosol. - Coronavirus in aerosols (≤5 µm particles), and non-significant reduction in respiratory droplets. Limitation: infectivity of detected virus not tested. --> Surgical face masks could prevent transmission of human coronaviruses and influenza viruses from symptomatic individuals
Antiviral Research 3APR2020	Remdesivir, lopinavir, emetine, and homoharringtonine inhibit SARS-CoV-2 replication in vitro	Choy, Yin-Lam Wong et al, Hong Kong https://doi.org/10.1016/j.antiviral.2020.104786	Therapeutic	Evaluation of the in vitro antiviral effect of compounds that were previously reported to inhibit coronavirus replication and compounds that are currently under evaluation in clinical trials for SARS-CoV-2 patients. => Antiviral effect of remdesivir, lopinavir, homoharringtonine, and emetine against SARS-CoV-2 virus in Vero E6 cells with the estimated 50% effective concentration at 23.15 µM, 26.63 µM, 2.55 µM and 0.46 µM, respectively. => Ribavirin or favipiravir that are currently evaluated under clinical trials showed no inhibition at 100 µM. => Synergy between remdesivir and emetine was observed, and remdesivir at 6.25 µM in combination with emetine at 0.195 µM may achieve 64.9% inhibition in viral yield. Combinational therapy may help to reduce the effective concentration of compounds below the therapeutic plasma concentrations and provide better clinical benefits.
International Journal of Antimicrobial Agents 3APR2020	Structural and molecular modeling studies reveal a new mechanism of action of chloroquine and hydroxychloroquine against SARS-CoV-2 infection	Fantini, Di Scala et al, France https://doi.org/10.1016/j.ijantimicag.2020.105960	Therapeutic	Identification of a new mechanism of action of CLQ and CLQ-OH supporting the use of these repositioned drugs to cure SARS-CoV-2 infected patients. Using a combination of structural and molecular modeling approaches : => chloroquine (CLQ) binds sialic acids and gangliosides with high affinity. => New type of ganglioside-binding domain at the tip of the N-terminal domain of the SARS-CoV-2 spike (S) protein identified. This domain (aa 111-158), which is fully conserved among clinical isolates worldwide, may improve the attachment of the virus to lipid rafts and facilitate the contact with the ACE-2 receptor. => In presence of CLQ (or of the more active derivative hydroxychloroquine, CLQ-OH), the viral spike is no longer able to bind gangliosides.

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Journal of Thrombosis and Thrombolysis 3APR2020	Difference of coagulation features between severe pneumonia induced by SARS-CoV2 and non-SARS-CoV2	Shiyu Y et al, China https://doi.org/10.1007/s11239-020-02105-8	Clinic	Retrospective – 2 groups 449 patients COVID-19 and 104 severe pneumonia non-COVID 28 days mortality → higher in COVID group (29,8% vs 15,4%, p<0,005) Heparin treatment: 22% in COVID and 21% non-COVID Platelet count: higher in COVID group significantly Elevated D-Dimer (sixfold of upper limit of normal) was associated with poor prognosis only in COVID group Anticoagulant therapy may benefit to selected COVID patients (elevated D-Dimer)? <u>Limits:</u> - Retrospective - Influence of others therapies?
Circulation 3APR2020	The Variety of Cardiovascular Presentations of COVID-19	Fried J et al, USA https://doi.org/10.1161/CIRCULATIONAHA.120.047164	Clinic	4 cases reports - SARS-CoV2 infection should be in the differential of typical cardiac syndrome during pandemic event without infection signs - Myocarditis like presentations with COVID-19 → further study - Direct cardiac injury = result of viral invasion OR cytokine storm induced by SARS-CoV2 → toxic effect on myocardium - COVID-19 can cause decompensation of heart failure → mixed shock
JAMA 3APR2020	Personal Risk and Societal Obligation Amidst COVID-19	Tsai et al., USA https://doi.org/10.1001/jama.2020.5450	HSS/Politic	Health workers with pre-existing medical conditions/in older age groups are at greater risk of severe illness and death if exposed to COVID-19. => Telemedicine Issue : guilt – putting other colleagues at risk; what risk acceptable as a necessary part of a path in medicine? Assessment takes an inherently individual path: no single rule can guide a physician's involvement in high-risk scenarios Comforted by : 1) High need for virtual-based care 2) Sense of purpose in the community How much risk in the career of medicine should be acceptable to physicians? → Need for medical profession to balance the obligations and duties of this profession with physicians' fundamentally human limitations and fears
Physical and Engineering Sciences in Medicine, 3APR2020	Covid-19: automatic detection from X-ray images utilizing transfer learning with convolutional neural networks	Apostolopoulos et al., Greece https://link.springer.com/article/10.1007/s13246-020-00865-4	Diagnostic	Technology evaluated is called Transfer Learning <u>Two sets of X-Ray images from patients were used as follow:</u> - 1st set: a collection of 1427 X-ray images including 224 images with confirmed Covid-19 disease, 700 images with confirmed common bacterial pneumonia, and 504 images of normal conditions. - 2nd set : 224 images with confirmed Covid-19 disease, 714 images with confirmed bacterial and viral pneumonia, and 504 images of normal conditions. Deep Learning with X-ray imaging would extract significant biomarkers related to the Covid-19 disease, while the best accuracy, sensitivity, and specificity obtained is 96.78%, 98.66%, and 96.46% respectively. Further research are needed to confirm the efficiency of this type of technology for automatic detection of Covid-19 cases; moreover, it is necessary to develop models capable of distinguishing Covid-19 cases from other similar viral cases, but also from a greater variety of common pneumonia or even physiological X-rays
Antiviral Research, 3APR2020	The FDA-approved Drug Ivermectin inhibits the replication of SARS-CoV-2 in vitro	Caly, Leon et al, Australia https://doi.org/10.1016/j.antiviral.2020.104787	Therapeutic	Ivermectin is an inhibitor of the COVID-19 causative virus (SARS-CoV-2) on Vero/hSLAM cells. A single treatment able to effect ~5000-fold reduction in virus at 48h in cell culture compared to control sample. Ivermectin is FDA-approved for parasitic infections, Ivermectin is widely available, due to its inclusion on the WHO model list of essential medicines

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The Lancet Microbe 2APR2020	Stability of SARS-CoV-2 in different environmental conditions	Chin, Alex W. H. et al., China https://doi.org/10.1016/S2666-5247(20)30003-3	Virology	<p><u>Infectious SARS-CoV-2 Stability at different temperatures (in virus transport medium) :</u></p> <ul style="list-style-type: none"> - highly stable at 4°C (only ~ 0.7 log-unit reduction of infectious titre on day 14) - at 70°C, virus inactivation reduced to 5 mins - On a surgical mask, infectious virus detectable on day 7 (~0.1% of the original inoculum). - Except from hand soap, no infectious virus detected after 5-min incubation at RT (22°C) with virucidal disinfectants (Household bleach (1:49), Ethanol (70%), Povidone-iodine (7.5%), ...). <p>--> SARS-CoV-2 can be highly stable in a favourable environment, but also susceptible to standard disinfection methods.</p>
Liver Int 2APR2020	Clinical characteristics of Non-ICU hospitalized patients with coronavirus disease 2019 and liver injury : A Retrospective study	Xie et al., Chine, https://doi.org/10.1111/liv.14449	Clinic	<p>Retrospective study of 79 patients, median age 60 years and 55.7% male. 29 had liver injury (elevated ALT, AST and/or bilirubin)</p> <p>Multivariate analysis suggested that CT scores was an independent predictor for liver injury. Patients with liver injury stayed longer in the hospital.</p> <p>116 patients – Retrospective study</p>
American journal of nephrology 2APR2020	Coronavirus Disease 19 Infection Does Not Result in Acute Kidney Injury: An Analysis of 116 Hospitalized Patients from Wuhan, China	Wang Lu et al, China https://doi.org/10.1159/000507471	Clinic	<p>Median age: 54y and 58% male 40% severe pneumonia and 9% were ARDS 4,3% had CKD with long-term hemodialysis</p> <p>None patient meet criteria for AKI during or after treatment 12 patients without CKD showed mild increase of BUN or serum creatinine (≠ criteria of AKI). Temporary abnormal renal function → injury due to hypoxemia? SARS-CoV2 RNA in urine sediment was positive in 4 patients Mortality: 6%</p> <p>Results are similar with study on SARS-CoV infection in 2003 Be careful because ACE2 expression is high in kidney. 2 groups: 115 COVID-19 and 114 controls (community acquired pneumonia)</p>
Liver Int 2APR2020	Liver impairment in COVID-19 patients: a retrospective analysis of 115 cases from a single center in Wuhan city, China	Zhang Y et al, China https://doi.org/10.1111/liv.14455	Clinic	<p>Controls significantly older – no other difference No difference between group in the level of ALT or AST Majority of COVID19 had mild abnormalities COVID-19 had reduction of albumin Liver is not the main target organ</p> <p><u>Relationship with the disease progression:</u></p> <ul style="list-style-type: none"> - Higher level of ALT or AST in severe cases than mild cases, - Higher total bilirubin in severe cases, - Lower level of albumin in severe cases, <p>Liver function did not show an independent association with severe COVID19</p>
CDC 1APR2020	Presymptomatic Transmission of SARS-CoV-2 — Singapore, January 23–March 16, 2020	Wei et al., China https://www.cdc.gov/mwr/volumes/69/wr/mm6914e1.htm?s_cid=mm6914e1_w#contribAff	Public Health/Epidemiology	-> Identification of 7 clusters of COVID-19 in Singapore in which presymptomatic transmission likely occurred and which may explain the occurrence of secondary cases

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The Lancet Neurology 1APR2020	Guillain-Barré syndrome associated with SARS-CoV-2 infection: causality or coincidence?	Zhao, Hua; et al. China https://www.thelancet.com/journals/lanneur/article/PIIS1474-4422(20)30109-5/fulltext	Clinic	<p>Patient was diagnosed with Guillain-Barré syndrome (autoimmune disorder damaging the peripheral nervous system resulting in aggravating muscle weakness) with lymphocytopenia and thrombocytopenia upon hospitalization.</p> <p>Patient then developed symptoms of SARS-CoV-2 on day 8 and tested +ve by RT-PCR.</p> <p>Given the temporal overlap, authors speculate that SARS-CoV-2 infection might have been responsible for the development of Guillain-Barré syndrome with a possible parainfectious profile.</p> <p>Limitations: patient was not tested for SARS-CoV-2 upon admission, so causality is not clear.</p> <p>->This is the first, and single case report. It only suggests a possible association and more cases are necessary to support a causal relationship.</p>
Nature 1APR2020	Virological assessment of hospitalized patients with COVID-2019	Wolfel et al. Germany https://www.nature.com/articles/s41586-020-2196-x	Virology	<p>A detailed virological analysis of 9 cases, providing proof of active virus replication in upper respiratory tract tissues.</p> <p>-> Pharyngeal virus shedding: very high during 1st week of symptoms.</p> <p>-> Infectious virus was readily isolated from throat- and lung-derived samples, but not from stool samples (in spite of high virus RNA concentration).</p> <p>-> Blood and urine never yielded virus.</p> <p>Active replication in the throat is confirmed by viral replicative RNA intermediates in throat samples.</p> <p>Sequence-distinct virus populations were consistently detected in throat and lung samples from the same patient, proving independent replication.</p> <p>Shedding of viral RNA from sputum outlasted the end of symptoms.</p> <p>Seroconversion occurred after 7 days in 50% of patients (14 days in all), but was not followed by a rapid decline in viral load.</p> <p>COVID-19 can present as a mild upper respiratory tract illness.</p> <p>Active virus replication in the upper respiratory tract puts the prospects of COVID-19 containment in perspective.</p>
NEJM 01APR2020	Ten Weeks to Crush the Curve	Fineberg, Harvey v. et al. USA https://doi.org/10.1056/NEJMe2007263	HSS/Politic	<ol style="list-style-type: none"> 1. Appoint a commander who reports to the President with powers and authority of the President to mobilize all civil and military means (same at the level of the state) + redeploy limited national supplies where most needed. 2. Perform millions of diagnostic tests over the next 2 weeks Organize dedicated clinical trial sites, physically separate from other health centers. 3. Provide all health workers with personal protective equipment. 4. Act on the basis of symptoms, examinations, viral RNA detection tests and exposures to differentiate the population into 5 groups to be treated accordingly : 1 / infected; 2 / presumed infected; 3 / exposed; 4 / unknown exposure/infection; 5 / recovered & sufficiently immune. Hospitalize severely affected or high-risk individuals+ create quarantine centers. Identify the fifth group by tests to enable economy to restart quickly and safely. 5. Mobilize the entire population. With PPE for all health workers, deliver surgical masks and hand sanitizer to every American household. If everyone is wearing a mask, no stigma. 6. Learn through real-time, fundamental research. <p>Over the long-term: Reinvigorate the public health infrastructure for future threats.</p>

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The Lancet) 01APR2020	Racism and discrimination in COVID-19 responses	Devakumar, D. et al., UK https://doi.org/10.1016/S0140-6736(20)30792-	HSS/Politic	<p>COVID 19 engenders fear => social, political racism and xenophobia with racialised/ discriminatory responses to fear + disproportionately affecting marginalised groups</p> <p>Social dimension : COVID could have been an equalizer but disproportionately affects people of color + migrants</p> <ol style="list-style-type: none"> 1) Microaggression/Violence towards different ethnic groups (i.e.: Chinese) 2) lower socio-economic groups (limited access to healthcare + precarious jobs) 3) Ethnic minority groups at greater risk (comorbidities) 4) Migrants avoid hospitals for fear of identification/reporting <p>Political dimension : Misappropriation of Covid-19 crisis for political purpose (racial discrimination, conflating public health restrictions and border policies + trade policies).</p> <p>Health protection relies on a well functioning health system with universal coverage, + social inclusion, justice, and solidarity</p>
Virolog Sin 31MAR2020	Inefficiency of Sera from Mice Treated with Pseudotyped SARS-CoV to Neutralize 2019-nCoV Infection	Zezhong Liu et al., China https://doi.org/10.1007/s12250-020-00214-5	Therapeutic	<p>S proteins:</p> <ul style="list-style-type: none"> - 76% homology SARS CoV / SARS CoV-2 - 29% homology SARS CoV / MERSCoV. <p>RBS:</p> <ul style="list-style-type: none"> - Significantly different, even if the bind to the same receptor (ACE2). <p>Cross-reaction of sera ?</p> <p>SARS-CoV and MERCoV pseudovirus expression S protein: produced and injected into BALBc mice.</p> <ul style="list-style-type: none"> -> Sera tested on ACE2 expressing 293T cells. -> Effective neutralization for SARS-PsV-treated mice but not MERS-PsV treated mice. <p>When SARS-PsV-treated mice was exposed to a SARS-CoV-2 pseudovirus -> no neutralization effect was evidenced.</p> <p>It may not be practical to treat SARS-CoV-2 patients.</p> <p>Retrospective study of 42 patients with treated hypertension admitted in hospitalization for COVID 19.</p> <p>Before hospitalization, 17 were on angiotensin-converting enzyme inhibitors (ACEIs) or angiotensin II type 1 receptor blockers (ARBs), 25 were on other drugs.</p> <p>Results : in patients from the ACEI/ARB group :</p> <ul style="list-style-type: none"> - Less severe cases - trend toward lower IL-6 levels - increased CD3 and CD8 T cell counts - peak viral load during hospitalization significantly lower <p>ACEI/ARB therapy may attenuate the inflammatory response, potentially through the inhibition of IL-6 levels</p> <p>Point of attention : retrospective study, small sample.</p> <p>Urgency: certain limits of this study are acceptable (small sample size, use of an unvalidated surrogate end point, lack of randomization or blinding, ...). But methodological flaws that may affect the validity of the results :</p>
Emerging microbes & infections 31MAR2020	Renin-angiotensin system inhibitors improve the clinical outcomes of COVID-19 patients with hypertension	Meng, Juan et al, Chine, https://doi.org/10.1080/22221751.2020.1746200	Therapeutic	<p>Retrospective study of 42 patients with treated hypertension admitted in hospitalization for COVID 19.</p> <p>Before hospitalization, 17 were on angiotensin-converting enzyme inhibitors (ACEIs) or angiotensin II type 1 receptor blockers (ARBs), 25 were on other drugs.</p> <p>Results : in patients from the ACEI/ARB group :</p> <ul style="list-style-type: none"> - Less severe cases - trend toward lower IL-6 levels - increased CD3 and CD8 T cell counts - peak viral load during hospitalization significantly lower <p>ACEI/ARB therapy may attenuate the inflammatory response, potentially through the inhibition of IL-6 levels</p> <p>Point of attention : retrospective study, small sample.</p> <p>Urgency: certain limits of this study are acceptable (small sample size, use of an unvalidated surrogate end point, lack of randomization or blinding, ...). But methodological flaws that may affect the validity of the results :</p>
Annals of internal medicine 30MAR2020	A Rush to Judgment? Rapid Reporting and Dissemination of Results and Its Consequences Regarding the Use of Hydroxychloroquine for COVID-19	Kim, Alfred H.J et al., USA https://doi.org/10.7326/M20-1223	HSS/Politic	<p>Conclusion:</p> <ul style="list-style-type: none"> -> Sufficient justification to continue investigation of the efficacy and safety of HCQ in patients hospitalized with COVID-19. -> No data currently to recommend the use of HCQ as a prophylaxis for COVID-19. ->No recommendation of its use outside of marketing authorization until it is justified and offer is reinforced. -> Risk of penury to patients with rheumatic diseases who depend on HCQ for their survival. -> HCQ shortage will limit availability to patients with COVID-19 if efficacy truly established.

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Medicine in Drug Discovery – pre-Proof 22MAR2020	Novel decoy cellular vaccine strategy utilizing transgenic antigen-expressing cells as immune presenter and adjuvant in vaccine prototype against SARS-CoV-2 virus	Henry Ji et al., China https://doi.org/10.1016/j.medidd.2020.100026	Vaccine	<p>S1 SARS-CoV-2 protein is expressed on the surface of K562 human myelogenous leukemia cells (HLA negative - highly sensitive to NK mediating kills):</p> <p>-> Provides a means of targeting and activating an innate driver of the host adaptive immune response. -> Stable clones are selected and irradiated to be formulated as vaccine product and administered via intramuscular or subcutaneous injection. This kind of cell vaccine can drive the host cellular immune response toward Th1, generating both potent cytotoxic T cell immunity against the major determinant of SARS-CoV-2 cellular entry and pathogenesis.</p> <p>This approach has already being used for cancer vaccine treatments inducing robust cellular and humoral anti-tumor immune responses.</p>
Journal of infectious Disease 31MAR2020	Characteristics of peripheral lymphocyte subset alteration in COVID-19 pneumonia	Fan W et al, China https://doi.org/10.1093/infdis/jiaa150	Immunology	<p>60 patients – monocentric – total lymphocytes in COVID-19 were compared to healthy controls (HC) Median age 60 y 32% were serious illness <u>Compared to HCs, COVID-19 had a decrease in:</u></p> <ul style="list-style-type: none"> - Total lymphocytes - CD4+ - CD8+ - NK cells and B cells <p><u>Serious compared to mild patient:</u></p> <ul style="list-style-type: none"> - Decrease total lymphocytes, CD4+, CD8+ and B cells in serious patients <p><u>Post-treatment:</u></p> <ul style="list-style-type: none"> - Total lymphocytes, CD8+ and B cells increased significantly in responders - No significant change in non responder's <p>CD8+ cells potential predictor for disease severity and poor clinical efficacy</p>
The Lancet ID 30MAR2020	Estimates of the severity of coronavirus disease 2019: a model-based analysis	Verity et al., UK https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(20)30243-7/fulltext#	Public Health/Epidemiology	<p><u>Using data on 24 deaths that occurred in mainland China and 165 recoveries outside of China:</u></p> <ul style="list-style-type: none"> - Mean duration from onset of symptoms to death : 17,8 days - Mean duration from onset to hospital discharge: 24,7 days - Crude case fatality ratio: 3,67% <p>After further adjusting for demography and under-ascertainment:</p> <ul style="list-style-type: none"> - Case fatality ratio: 1,38% / <60 y : 0,32% / >60y: 6,4% / >80y: 13,4% <p>Estimates of case fatality ratio from international cases stratified by age were consistent with those from China (see paper for data)</p> <p>Estimated overall infection fatality ratio for China: 0-66%, with an increasing profile with age.</p> <p>Estimates of the proportion of infected individuals likely to be hospitalised increased with age up to a maximum of 18-4% in those aged 80 years or older.</p>
Journal of Gastroenterology and Hepatology 27MAR2020	Covid-19 and the Digestive System	Wong S et al, China https://doi.org/10.1111/jgh.15047	Clinic	<p>Diarrhoea (2 to 10%) and nausea/vomiting (1 to 10%) are the most frequent gastrointestinal symptoms.</p> <p>Early in the disease course: earlier than pyrexia</p> <p>Liver injury: abnormal level of ALAT and ASAT in 15 to 53 % of patients – mild and transient</p> <ul style="list-style-type: none"> → microvesicular steatosis and mild lobular activity → direct viral infection of hepatocytes (ACE2 receptor) or drug toxicity or immune-related injury <p>Possible tropism of SARS-CoV-2 for gastrointestinal tract: ACE2 receptor</p> <p>Faecal source: viral transmission ?</p>

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The Lancet ID 27MAR2020	Clinical and virological data of the first cases of COVID-19 in Europe: a case series	Lescure et al., France https://doi.org/10.1016/S1473-3099(20)30200-0	Clinic	<p>5 Patients: 3 men: aged 31 years, 48 years, and 80 years – 2 women: aged 30 years and 46 years</p> <p>3 different clinical evolutions: - 2 paucisymptomatic women diagnosed within a day of exhibiting symptoms, with high nasopharyngeal titres of SARS-CoV-2 within the first 24 h of the illness onset and viral RNA detection in stools - A two-step disease progression in 2 young men, with a secondary worsening around 10 days after disease onset despite a decreasing viral load in nasopharyngeal samples - an 80-year-old man with a rapid evolution towards multiple organ failure and a persistent high viral load in lower and upper respiratory tract with systemic virus dissemination and virus detection in plasma.</p> <p>The 80-year-old patient died on day 14 of illness. All other patients had recovered and been discharged by Feb 19, 2020.</p>
Clinical Infectious Disease 27MAR2020	Clinical characteristics of refractory COVID-19 pneumonia in Wuhan, China	Mo P et al, China https://doi.org/10.1093/cid/ciaa270	Clinic	<p>155 patients with median age of 54 years – 85 refractory COVID-19:</p> <ul style="list-style-type: none"> - Older and more male ($p < 0,05$) - More comorbidities: diabetes, cardiovascular disease, cerebrovascular disease ($p < 0,05$) - Higher incidence of breath shortness and anorexia ($p < 0,05$) - Bilateral pneumonia - Higher CRP, LDH, ASAT and neutrophile <p>Risk factors:</p> <ul style="list-style-type: none"> - Male (OR: 2,3 [1,0-4,8]) and anorexia admission (OR:3,9 [1,1-13,4]) <p>Received more oxygen (OR: 3,0), corticosteroid (OR:2,32) Protective factor: fever on admission (OR: 0,33 [0,1 – 0,9])</p>
JAMA 27MAR2020	Treatment of 5 critically ill patients with COVID-19 with convalescent plasma	Shen C et al, China https://jamanetwork.com.proxy.insermbiblio.inist.fr/journals/jama/fullarticle/2763983	Therapeutic	<p>5 patients: severe pneumonia + $P_{AO_2}/F_{IO_2} < 300$mmHg + currently or has been supported by mechanical ventilation All received antiviral agents and steroids Administered between 10 and 22 days after admission</p> <p>After transfusion:</p> <ul style="list-style-type: none"> - Ct value and viral load declined - Value of inflammatory biomarkers decreased - Clinical improvement: improved P_{AO_2}/F_{IO_2}, reduced body temperature, improved chest imaging - No longer required respiratory support by 9 days after transfusion <p>Limitations:</p> <ul style="list-style-type: none"> - No control group and small cases - Improved without transfusion? / Improvement related to transfusion or other therapies? - Late administration of transfusion: different timing would be associated with different outcomes?
The Lancet 27MAR2020	Historical linkages: epidemic threat, economic risk, and xenophobia	White, A. et al., USA https://doi.org/10.1016/S0140-6736(20)30737-6	HSS/Politic	<p>Global management of pandemic disease threats and global commerce historically linked:</p> <ul style="list-style-type: none"> - History of international infectious disease control shaped by a distinctly European/US perspective prioritizing epidemic threats from colonial/post-colonial sites potentially affecting trade (=> aggressive control in sites of epidemic outbreak and aggressive scrutiny of those deemed responsible. <ul style="list-style-type: none"> - Importance of colonial trade from Asia led to bias against people of Asian descent. “Chinese virus” connected to a long legacy of associating epidemic disease threat and trade with movement of Asian peoples. <p>Aggressive racist and xenophobic responses in the name of health controls.</p> <ul style="list-style-type: none"> - Concern for trading relationships central to US economic growth pivotal for US Congress to endorse creation of WHO. - Nations have recently aligned infectious disease control policy alongside concerns for national security.

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J. Med. Virol. 26MAR2020	Stability Issues of RT-PCR Testing of SARS-CoV-2 for Hospitalized Patients Clinically Diagnosed with COVID-19	Li et al., China https://doi.org/10.1002/jmv.25786	Diagnostic	<p><u>610 hospitalized patients from Wuhan</u></p> <ul style="list-style-type: none"> -> High false negative rate of RT-PCR testing -> RT-PCR results from several tests at different points were variable from the same patients during the course of diagnosis and treatment of these patients <p>Clinical indicators such as CT images should also be used not only for diagnosis and treatment but also for isolation, recovery/discharge and transferring for hospitalized patients clinically diagnosed with COVID-19 during the current epidemic.</p>
JAMA 26MAR2020	Antibodies in Infants Born to Mothers With COVID-19 Pneumonia	Zeng et al., China https://jamanetwork.com/journals/jama/fullarticle/2763854	Clinic	<p>A novel study on 6 pregnant women and their infants confirm no maternal-infant transmission of SARS-CoV-2 based on reverse transcriptase–polymerase chain reaction (RT-PCR) and reveals the presence of antibodies in all newborns :</p> <ul style="list-style-type: none"> · 6 mothers had mild clinical manifestations and had cesarean deliveries in their third trimester · Neonatal throat swabs and blood samples are negative by RT-PCR test · All 6 infants had IgG and IgM virus-specific antibodies in their serum and their mothers also had elevated levels of IgG and IgM · Inflammatory cytokine IL-6 was significantly increased in all infants. <p>Point of care/conclusion The detection of high level of IgM In 2 infants, is not usually. Whether the placentas of women were damaged and abnormal or whether IgM could have been produced by the infant if the virus crossed the placenta need to be confirm in a larger cohort.</p>
BMJ 26MARS2020	The world's largest refugee camp prepares for covid-19	Gaia Vince, UK https://doi.org/10.1136/bmj.m1205	HSS/Politic	<p><u>Biggest camp in Cox's Bazar (Bangladesh):</u></p> <ul style="list-style-type: none"> - Nearly 1 million people live in overcrowded conditions. - Particularly vulnerable (physical distancing impossible). <p>United Nations Refugee Agency coordinate efforts to increase hand washing, using community leaders to inform (imams and women group leaders).</p> <p>Other initiative for preparedness : creasion of isolation unit in the camp. Aid workers are credible after experience of managing other crisis (malaria, dengue, cholera...) in the camp since 2 years and a half.</p>
The Lancet Public Health 25MAR2020	The Italian health system and the COVID-19 challenge	Armocida et al., Italy https://doi.org/10.1016/S2468-2667(20)30074-8	HSS/Politic	<p>In Italy, National Healthcare Service is regionally based, with local authorities responsible for the organisation and delivery of health services. Due to progressive privatisation and finance cuts, system close to collapse. 4 lessons to be learned :</p> <ul style="list-style-type: none"> - Decentralisation and fragmentation of health services seems to have restricted timely interventions and effectiveness - Health-care systems capacity and financing need to be more flexible in case of emergencies - Solid partnerships between the private and public sector should be institutionalised - Recruitment of HR must be planned and financed with a long-term vision

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Lancet 25MAR2020	Clinical features and obstetric and neonatal outcomes of pregnant patients with COVID-19 in Wuhan, China: a retrospective, single-centre, descriptive study	Yu N. et al, China https://www.thelancet.com/pdfs/journals/laninf/PIIS1473-3099(20)30176-6.pdf	Clinic	<p><u>Pregnant patients with COVID 19 – no ICU :</u> Mean age gestational: 39 + 1 - All caesarean section Fever (6) - Cough (1) - Shortness of breath (1) - Diarrhea (1) Laboratory tests: - Elevated CRP (7) - Lymphopenia (5) – thrombopenia (2) - Elevated IL-6 (4) Chest CT: all pneumonia → bilateral (6), unilateral (1) Treatment: oxygen + antiviral + antibiotic (single or combination) + traditional medicine. Methylprednisolone for 5 after caesarean section. Neonatal: 3 stays in observation and 1 was positive for SARS-CoV2 with mild shortness of breath. At 28 days after birth: all child was healthy No arguments for vertical transmission</p>
SCIENCE 25MAR2020	The effect of human mobility and control measures on the COVID-19 epidemic in China	Kraemer et al., UK https://science.sciencemag.org/content/early/2020/03/25/science.abb4218	Public Health/Epidemiology	<p><u>Use of real-time mobility data from Wuhan and detailed case data including travel history</u> -> Early: spatial distribution of COVID-19 cases in China was explained well by human mobility data -> After implementation of control measures: this correlation dropped and growth rates became negative in most locations</p> <p>Travel restrictions are particularly useful in the early stage of an outbreak when it is confined to a certain area that acts as a major source. However, travel restrictions may be less effective once the outbreak is more widespread.</p>
Inter J of Infectious Diseases 25MAR2020	Epidemiological, clinical characteristics of cases of SARS-CoV-2 infection with abnormal imaging findings	Zhang X et al, China https://www.ijidonline.com/article/S1201-9712(20)30172-7/fulltext	Clinic	<p>645 patients with 72 no-pneumonia and 573 pneumonia Bilateral lung disease: 432 (67%) Group with pneumonia: - Older: 46,6 vs 34,9 years - One coexisting underlying: 28,8% vs 16% - Less exposure to Wuhan or confirmed patient - Time from onset to COVID-19 was longer: 5 days vs 2 days - Symptoms: fever and cough - Lower lymphocyte, albumin and NaCl - Higher LDH and CRP</p> <p><u>Predictive factor of severe pneumonia:</u> - Lymphopenia and higher creatinine - Shortness of breath</p>
Disaster medicine and public health preparedness 24MAR2020	Chronology of COVID-19 cases on the Diamond Princess cruise ship and ethical considerations: a report from Japan	Nakazawa, et al. Japan http://www.ncbi.nlm.nih.gov/pubmed/32207674	HSS/Political	<p><u>Ship = virus incubator + "international miniature company"</u> -> Difficulty in testing such a large number of people of various origins and faiths <u>Recommendations of the article:</u> Politically: -> Alert political decision-makers to the impact of multiple, contradictory, false or unconfirmed information on the health of confined passengers -> Mobilize collective intelligence / academic consensus by involving a large number of experts</p> <p>In terms of ethics and public health: -> When is the principle of confinement at sea justified: human rights dilemma (ensuring minimum well-being for passengers and crew) / health security (preventing the spread of the virus on land) -> Two criteria for authorizing a ship to dock or not = "1) the nation's geopolitical status + 2) the nation's ability to provide adequate health care ». -> Optimizing the material and psychological conditions of confinement on a ship: access to medication; psychological support ; means of communication with the outside world ; transparency and consistency of media information + take into account cultural differences</p> <p>Legally: -> Design and implement international regulations because an epidemic on board a ship should not be dealt with solely with regard to local policies (territory in which the ship is at anchor) -> Strengthen international cooperation.</p>

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The Lancet Global Health 24MAR2020	Early in the epidemic: impact of preprints on global discourse about COVID-19 transmissibility COMMENT	Maimuna et al., USA https://doi.org/10.1016/S2214-109X(20)30113-3	HSS/Politic	<p><u>Novelty of SARS-CoV-2, so scientists rushed to fill epidemiological, virological, and clinical knowledge gap</u></p> <p>-> 50 new studies about the virus between January 10 and January 30 alone.</p> <p>Use of a simple method to plot the ten R0 estimations posted as preprints before publication of the first peer-reviewed study on Jan 29. Result of the peer review R0 estimations are very similar to those in the peer-reviewed studies published on and after Jan 29.</p> <p>Conclusions :</p> <ul style="list-style-type: none"> - Powerful role preprints can have during public health crises because of the timeliness with which they can disseminate new information. - Use of preprint does not jeopardise future peer-reviewed publication (first step : preprint and then peer reviewed) - Impact of preprints on discourse and decision making to the ongoing COVID-19 outbreak (even if in some cases the preprints have conveyed erroneous ideas)
Emerging microbes and Infections 24MAR2020	Establishment and validation of a pseudovirus neutralization assay for SARS-CoV-2	Jianhui Nie et al, China http://www.ncbi.nlm.nih.gov/pubmed/32207377	Therapeutic	<p>Necessity of handling SARS-CoV-2 in BSL-3 facilities and accessibility to virus strains -> barriers to develop candidate vaccines and therapeutics.</p> <p>-> Hence, development of a SARS-CoV-2 pseudovirus based in neutralization assays using 5 viral genes cloned into pcDNA3.1 plasmids. -> Expressed in a VSV pseudoviral platform. -> Huh7 cells plated at 5x10⁴/well were identified as the best cell system for SARS-CoV2 pseudovirus infection (inocula of 650 TCID50/well).</p> <p>When tested against the SARS-CoV-2 pseudovirus, SARS-CoV-2 convalescent patient sera showed high neutralizing potency, which underscore its potential as therapeutics.</p> <ul style="list-style-type: none"> • at home = stress can be eased • in local hospitals/ collective medical observation centers = separated from caregivers (children infected/suspected of being infected or caregivers infected/dead) Potential consequences: 1) grief and fear + 2) potential mood disorders and psychosis/death by suicide in adulthood <p>30% = post-traumatic stress disorder</p> <p>Chinese gov. strategies to prevent risks :</p> <ol style="list-style-type: none"> 1. nurses 24 h per day 2. guidance by nutritionists for children's diets 3. communication with parents any time 4. citizens volunteering as temporary mothers 5. 24 h free psychological counselling hotlines <p>Guidelines issued: more communication time with parents; access to disease information via comic books and videos; regular activity schedule ; night lights and gifts for children; referrals for psychiatrists</p> <p>Need for :</p> <ol style="list-style-type: none"> 1. formal training for paediatric health-care workers 2. evidence-based guidelines 3. national collaborative networks (psychiatrists, psychotherapists, researchers, community volunteers) 4. post-pandemic surveillance of children
The Lancet Child & Adolescent Health 24MAR2020	Mental health considerations for children quarantined because of COVID-19	Liu, Jiā Jiā; Bao, Yanping et al., China https://doi.org/10.1016/S2352-4642(20)30096-1	HSS/Politic	<p>30% = post-traumatic stress disorder</p> <p>Chinese gov. strategies to prevent risks :</p> <ol style="list-style-type: none"> 1. nurses 24 h per day 2. guidance by nutritionists for children's diets 3. communication with parents any time 4. citizens volunteering as temporary mothers 5. 24 h free psychological counselling hotlines <p>Guidelines issued: more communication time with parents; access to disease information via comic books and videos; regular activity schedule ; night lights and gifts for children; referrals for psychiatrists</p> <p>Need for :</p> <ol style="list-style-type: none"> 1. formal training for paediatric health-care workers 2. evidence-based guidelines 3. national collaborative networks (psychiatrists, psychotherapists, researchers, community volunteers) 4. post-pandemic surveillance of children

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The Lancet 23MAR2020	Temporal profiles of viral load in posterior oropharyngeal saliva samples and serum antibody responses during infection by SARS-CoV-2: an observational cohort study	Kai-Wang et al., China https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(20)30196-1/fulltext	Virology	<p>23 persons were included</p> <ul style="list-style-type: none"> - Median viral load in posterior oropharyngeal saliva or other respiratory specimens at presentation was 5.2 log₁₀ copies per mL - Salivary viral load: highest during the first week after symptom onset and subsequently declined with time - In one patient, viral RNA was detected 25 days after symptom onset. - Older age was correlated with higher viral load - For 16 patients with serum samples available 14 days or longer after symptom onset, rates of seropositivity were 94% for anti-NP IgG, 88% for anti-NP IgM, 100% for anti-RBD IgG, and 94% for anti-RBD IgM. - Anti-SARS-CoV-2-NP or anti-SARS-CoV-2-RBD IgG levels correlated with virus neutralisation titre.
JAMA 23MAR2020	Ethics Committee Reviews of Applications for Research Studies at 1 Hospital in China During the 2019 Novel Coronavirus Epidemic	Zhang H et al.- China https://doi.org/10.1001/jama.2020.4362	HSS/Politic	<ul style="list-style-type: none"> - Henan hospital: designated to provide care to COVID-19 patients. - Hospital ethics committee organized 4 emergency video conference in 35 days. - Projects evaluated within 2,13 days after submission: more quickly than other previous boards organized in an outbreak context. - 41 applications were reviewed; 6 were approved; 4 rejected; and 31 referred for modification because of lack statistical basis for sample size calculation, deficiencies in inclusion/exclusion criteria or issues related to consent form. Although the rush, review standards were not lowered during the outbreak.
Open Forum Infect Dis 21MAR2020	High-dose intravenous immunoglobulin as a therapeutic option for deteriorating patients with Coronavirus Disease 2019	Wei Cao and al, Chine https://doi.org/10.1093/ofid/ofaa102	Therapeutic	<p>3 adults (56, 34 and 35 y)</p> <ul style="list-style-type: none"> - treated by 25 grams per day for five days of immunoglobulins at the time of respiratory distress initiation + antibiotic - temperature back to normal in one to two days, and breathing difficulties alleviating in 3-5 days <p>Point of attention: other treatments were given, antiviral for 2/3 patients, corticoid for 1.</p> <p>The first few days of deterioration may present a critical point when potent suppression of inflammatory cascade could save the patients from fatal immune-mediated injuries</p> <p>Hospitalized patients : i) age >12 years and ii) PCR documented SARS-CoV-2 carriage in nasopharyngeal sample at admission</p>
International journal of antimicrobial agents 20MAR2020	Hydroxychloroquine and azithromycin as a treatment of COVID-19: results of an open-label non-randomized clinical trial	Gautret, and al, France https://www.sciencedirect.com/science/article/pii/S0924857920300996	Therapeutic	<ul style="list-style-type: none"> - Treatment: oral hydroxychloroquine sulfate 200 mg, 3/day during 10 days. - 26 treated among them, six patients received additional azithromycin. - Control group : 16 patients from another centre or refusal to participate - 6 patients treated were excluded from the analysis <p>Primary endpoint : virological clearance at day-6 post-inclusion</p> <p>70% of hydroxychloroquine-treated patients (N=20) were virologically cured comparing with 12.5% in the control group (N=16) (p= 0.001)</p>

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Journal Travel Medicine and Infectious Disease 20MAR2020	COVID-19: Active measures to support community-dwelling older adults	K, Kuwahara et al., Japan http://www.ncbi.nlm.nih.gov/pubmed/32205272	HSS/Politic	<p>-> With no proven drug and vaccine treatments, non-pharmaceutical measures, especially social distancing, are an essential to slow the spread of the epidemic.</p> <p>-> Given the higher risk associated with older adults, practical information should be provided to community-dwelling adults to help maintain appropriate community activity levels.</p> <p>-> Issue of social isolation: efforts are needed to mitigate the negative psychological impact. recent technological advances may help detect and provide care for groups at high risk of social isolation. plans and measures to maintain social ties should be prepared at the individual level (family, friends, neighborhood, etc.), organizational or community levels, and societal level.</p>
Travel Med Infect Dis 20MAR2020	Rapid viral diagnosis and ambulatory management of suspected COVID-19 cases presenting at the infectious diseases referral hospital in Marseille, France, - January 31st to March 1st, 2020: A respiratory virus snapshot	Amrane et al, France http://www.ncbi.nlm.nih.gov/pubmed/32205269	Public Health/Epidemiology	<p>Rapid viral detection performed on sputum and nasopharyngeal samples from the first 280 patients suspected to have COVID-19.</p> <p>No SARS-CoV-2 was detected. Other viral infections were identified in 49% of the patients, with most common pathogens being influenza A and B viruses, rhinovirus, metapneumovirus and common coronaviruses, notably HKU1 and NL63.</p>
Cell Mol Immunol 19MAR2020	Characterization of the receptor-binding domain (RBD) of 2019 novel coronavirus: implication for development of RBD protein as a viral attachment inhibitor and vaccine	Wanbo Tai et al., China https://www.nature.com.proxy.insermbiblio.inist.fr/articles/s41423-020-0400-4	Vaccine	<p>-> SARS-CoV-2 receptor-binding domain (RBD) protein could be used as a therapeutic agent against SARS-CoV-2 and SARS-CoV infection (from results <i>in vitro</i>)</p> <p>-> RBD in SARS-CoV-2 S protein was identified</p> <p>-> RBD protein bound strongly to human and bat angiotensin-converting enzyme 2 (ACE2) receptors.</p> <p>- SARS-CoV RBD-specific antibodies could crossreact with SARS-CoV-2 RBD protein</p> <p>- SARS-CoV RBD-induced antisera could cross-neutralize SARS-CoV-2 -> potential to develop SARS-CoV RBD-based vaccines for prevention of SARS-CoV-2 and SARS-CoV infection.</p>
NEJM 19MAR2020	A trial of liponavir-ritonavir in adults hospitalized with severe Covid-19	Cao B et al, China https://www.nejm.org/doi/pdf/10.1056/NEJMoa2001282?articleTools=true	Therapeutic	<p>Randomized, controlled trial, open-label trial</p> <p>☑ 199 patients included: 99 received lopinavir-ritonavir and 100 standard care alone:</p> <ul style="list-style-type: none"> • Lopinavir-ritonavir was not associated with clinical improvement or mortality: median time to clinical improvement 16 days vs 16 days, HR = 1.31 [0.95 – 1.85] <p>Others outcomes:</p> <ul style="list-style-type: none"> • 28-days mortality lower in the lopinavir-ritonavir group: 19.2% vs 25%, difference -5.8 % [-17.3 – 5.7] • Detectable viral RNA for SARS-CoV2 was similar between two groups: 40.7 % of the patients of lopinavir-ritonavir group at the end of trial (28d) • Serious adverse events: 19 in the lopinavir-ritonavir group (4 serious gastrointestinal adverse events related to the trial medication) and 32 in the standard care alone. • No difference on duration of oxygen therapy and duration hospitalization. • Post hoc finding that early initiation of lopinavir-ritonavir might accelerate clinical recovery and reduced mortality <p>Overall mortality at 22.1%</p> <p>No benefit was observed with lopinavir-ritonavir treatment</p>

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NEJM 19MAR2020	SARS-CoV2 Infection in children	Lu X. et al, China https://www.nejm.org/doi/pdf/10.1056/NEJMc2005073?articleTools=true	Clinic	<p>On the 1391 children tested at Wuhan Children's Hospital, 171 (12.3%) were positive for SARS-CoV2 infection.</p> <p>Median age: 6.7 years - Male: 60.8 % Fever: 41.5 % - Cough: 48.5 % Pneumonia: 64.9 %</p> <p>3 patients (with coexisting conditions) require intensive care and 1 death Most children appear to be mild symptomatic.</p>
World Journal of Pediatrics 19MAR2020	Clinical features of severe pediatric patients with coronavirus disease 2019 in Wuhan: a single center's observational study	Sun D et al, China https://link.springer.com.proxy.insermbiblio.inist.fr/content/pdf/10.1007/s12519-020-00354-4.pdf	Clinic	<p>8 children included: 5 severely ill and 3 critically ill 2 months to 15 years</p> <p>Symptoms:</p> <ul style="list-style-type: none"> - Polypnea 100% - Fever (6/8) - Cough (6/8) - Expectoration (4/8) <p>Abnormalities in chest scanning 100% patients:</p> <ul style="list-style-type: none"> - multiple patch-like shadows - ground glass opacity <p>Biological:</p> <ul style="list-style-type: none"> - increase CRP, PCT and LDH - elevated ALAT - increase IL6 (2/8), IL10 (5/8), IFN-γ (2/8) <p>Level of IL6 and IL10 were significantly increase in 2 critically ill patient who remained in ICU for 20 days.</p> <p>Specific laboratory abnormalities and excessive immune responses may lead to long-term lung damage and severe health complication</p>
Cell and Mol Biol 17MAR2020	Elevated exhaustion levels and reduced functional diversity of T cells in peripheral blood may predict severe progression in COVID-19 patients	Zheng et al., USA https://www.nature.com/articles/s41423-020-0401-3	Immunology	<p>Immunological characteristics of peripheral blood leukocytes from 16 patients:</p> <p>Compared to healthy group (n=6):</p> <ul style="list-style-type: none"> - Frequency of multi-functional CD4+ T cells (positive for at least two cytokines) decreased significantly in the severe group - The proportion of non-functional (IFN-γ-TNF-α-IL-2-) subsets increased significantly. - No increase in neutrophils or decrease in lymphocytes. - No statistical differences in interleukin-6 (IL-6) and tumor necrosis factor-α (TNF-α) plasma concentrations were found among the three groups <p>- Levels of interferon-γ (IFN-γ) and TNF-α in CD4+ T cells were lower in the severe group than in the mild group, whereas the levels of granzyme B and perforin in CD8+ T cells were higher in the severe group than in the mild group.</p> <p>- Frequency of multi-functional CD4+ T cells decreased significantly in the severe group and proportion of non-functional subsets increased significantly</p> <p>-> Identification of potential immunological risk factors for COVID-19 pneumonia and provided clues for its clinical treatment.</p>
The NEJM 17MAR2020	Aerosol and Surface Stability of SARS-CoV-2 as Compared with SARS-CoV-1	Doremalen et al., USA https://www.nejm.org/doi/pdf/10.1056/NEJMc2004973?articleTools=true	Virology	<p>-> Stability of SARS-CoV-2 was similar to that of SARS-CoV-1 under the experimental circumstances tested.</p> <p>-> Detectable in aerosols for up to three hours, up to four hours on copper, up to 24 hours on cardboard and up to two to three days on plastic and stainless steel.</p> <p>Aerosol and fomite transmission of SARS-CoV-2 is plausible</p>

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The Lancet 17MAR2020	Prevention of SARS-CoV-2 infection in patients with decompensated cirrhosis	Xiao et al., China https://www.thelancet.com/journals/langas/article/PIIS2468-1253(20)30080-7/fulltext	Clinic	<p>Previously known: Patients with decompensated cirrhosis have a higher risk of, and mortality from, infection.</p> <p>-> 111 patients with decompensated cirrhosis (were included) -> New precautionary procedures were implemented (see paper) -> Incidence of COVID19 was lower than in other groups.</p> <p>The simple approach (see paper) could be an effective means of preventing COVID-19 in patients with decompensated cirrhosis.</p>
International journal of infectious diseases 17MAR2020	Transmission potential and severity of COVID-19 in South Korea	Shim et al., Rep of Korea https://www.ijidonline.com/article/S1201-9712(20)30150-8/fulltext	Public Health/Epidemiology	<p>- COVID-19 caused 6,284 cases and 42 deaths in South Korea as of March 8, 2020.</p> <p>- The mean reproduction number R_t of COVID-19 in Korea was estimated at 1.5 (95% CI: 1.4-1.6)</p> <p>- The intrinsic growth rate was estimated at 0.6 (95% CI: 0.6, 0.7) and the scaling of growth parameter was estimated at 0.8 (95% CI: 0.7, 0.8), indicating sub-exponential growth dynamics of COVID-19</p> <p>- The crude case fatality rate is higher among males (1.1%) compared to females (0.4%) and increases with older age, from 0.1% among those 30-39 yrs to 6% among those > = 80 yrs as of March 6, 2020.</p> <p>- Results indicate early sustained transmission of COVID-19 in South Korea and support the implementation of social distancing measures to rapidly control the outbreak.</p>
J Inf Dis 17MAR2020	Clinical outcome of 55 asymptomatic cases at the time of hospital admission infected with SARS-Coronavirus-2 in Shenzhen, China.	Wang et al., China https://academic.oup.com/ijid/advance-article/doi/10.1093/infdis/jiaa119/5807958	Clinic	<p>55 asymptomatic carriers</p> <p>Conclusions: -> Asymptomatic carriers occurred more often in middle aged people who had close contact with infected family members -> Majority of the cases developed to be mild and ordinary COVID-19 during hospital</p>
Am J Transplant. 17MAR2020	Successful recovery of COVID-19 pneumonia in a renal transplant recipient with long-term immunosuppression.	Zhu et al., China https://onlinelibrary.wiley.com/doi/abs/10.1111/ajt.15869	Clinic	<p>52-year-old man who received kidney transplantation 12 years ago</p> <p>-> Clinical characteristics (symptoms, laboratory examinations, and chest CT) were similar to those of non-transplanted COVID-19 patients</p> <p>-> Following a treatment regimen: reduced immunosuppressant use and low dose methylprednisolone-based therapy</p> <p>Effectively treated case has reference value for the future treatment of other transplant patients with COVID-19 pneumonia. Analysis of additional cases is necessary to determine if this remains true.</p>
J Med Virol 17MAR2020	Platelet-to-lymphocyte ratio is associated with prognosis in patients with Corona Virus Disease-19.	Qu et al., China https://onlinelibrary.wiley.com/doi/abs/10.1002/jmv.25767	Clinic	<p>-Retrospective analysis of 30 hospitalized patients</p> <p>-> Patients with platelet peaks during treatment: longer hospitalization.</p> <p>-> Patients with platelet peaks were older</p> <p>-> Higher PLT (platelet to lymphocyte ratio): longer hospitalisation.</p> <p>It may be related to cytokine storm.</p>

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The Lancet 17MAR2020	Prisons and custodial settings are part of a comprehensive response to COVID-19	Kinnet et al., Australia https://www.thelancet.com/journals/lanpub/article/PIIS2468-2667(20)30058-X/fulltext	Public Health/Epidemiology	<p>Prisons are epicentres for infectious diseases:</p> <ul style="list-style-type: none"> - higher background prevalence of infection - higher levels of risk factors for infection - unavoidable close contact in often overcrowded, poorly ventilated, and unsanitary facilities, - poor access to health-care services relative to that in community settings <p>-> The public health importance of prison responses to influenza outbreaks has been recognised in the USA, where the Centers for Disease Control and Prevention have developed a checklist for pandemic influenza preparedness in correctional settings. WHO has also issued prison-specific guidance for responding to COVID-19.</p>
Arch Pathol Lab Med. 17MAR2020	An Analysis of 38 Pregnant Women with COVID-19, Their Newborn Infants, and Maternal-Fetal Transmission of SARS-CoV-2: Maternal Coronavirus Infections and Pregnancy Outcomes	Schwartz et al., USA https://www.archivesofpathology.org/doi/pdf/10.5858/arpa.2020-0901-SA	Clinic	<p>Analyzing literature describing 38 pregnant women with COVID-19 and their newborns in China</p> <p>-> Unlike coronavirus infections of pregnant women caused by SARS and MERS, COVID-19 did not lead to maternal deaths -> Similar to pregnancies with SARS and MERS: no confirmed cases of intrauterine transmission of SARS-CoV-2</p> <p>There is no evidence that SARS-CoV-2 undergoes intrauterine or transplacental transmission from infected pregnant women to their fetuses.</p>
Gynecologie, obstetrique, fertilité & senologie 16 MAR2020	Infection with SARS-CoV-2 in pregnancy. Information and proposed care. CNGOF	Peyronnet et al., France https://www.sciencedirect.com/science/article/pii/S2468718920301100?via%3Dihub	Clinic	<p>Few pregnant women have been described Same symptoms as rest of adult's patients Some cases of ARDS or pneumonia</p> <p>2 pregnant women with invasive ventilation have been described Risk: cesarian and prematurity No miscarriage described</p> <p>Neonatal:</p> <ul style="list-style-type: none"> - no case of vertical transmission - milder symptomatic - symptoms probably due to maternal hypoxemia
Nat Med 16MAR2020	Breadth of concomitant immune responses prior to patient recovery: a case report of non-severe COVID-19	Thevarajan et al., Australia https://www.nature.com/articles/s41591-020-0819-2	Immunology	<p>-> Kinetics of immune responses in relation to clinical and virological features of a patient with mild-to-moderate coronavirus disease 2019 (COVID-19) that required hospitalization.</p> <p>The emergence and rapid increase in activated CD38+HLA-DR+ T cells, especially CD8+ T cells, at days 7–9 preceded the resolution of symptoms:</p> <p>-> ASCs appeared in the blood at the time of viral clearance (day 7; 1.48%) and peaked on day 8 (6.91%).</p> <p>-> Emergence of cTFH cells in blood at day 7 (1.98%), increasing on day 8 (3.25%) and day 9 (4.46%)</p> <p>-> The frequency of co-expression of CD38 and HLA-DR on CD8+ T cells increased in this patient from day 7 (3.57%) to day 8 (5.32%) and day 9 (11.8%) as well as the frequency of co-expression of CD38 and HLA-DR on CD4+ T cells between day 7 (0.55%) and day 9 (3.33%) although at lower levels than that of CD8+ T cells.</p> <p>-> CD38+HLA-DR+ CD8+ T cells, produced larger amounts of granzymes A and B and perforin (~34–54% higher) than did their parent cells (CD8+or CD4+ populations).</p> <p>-> Interestingly, minimal pro-inflammatory cytokines and chemokines were found in this patient with COVID-19, even at days 7–9.</p>

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SCIENCE 16MAR2020	Substantial undocumented infection facilitates the rapid dissemination of novel coronavirus(SARS-CoV2).	Li et al, UK https://science.sciencemag.org/content/early/2020/03/13/science.abb3221.long	Public Health/Epidemiology	<p>From observations of reported infection within China + mobility data + a networked dynamic metapopulation model and Bayesian inference</p> <p>-> 86% of all infections were undocumented (95% CI: [82%–90%]) prior to 23 January 2020 travel restrictions.</p> <p>-> Undocumented infections were the infection source for 79% of documented cases</p> <p>It explain the rapid geographic spread of SARS-CoV2 and indicate containment of this virus will be particularly challenging</p>
The Lancet 16MAR2020	Preparedness is essential for malaria-endemic regions during the COVID-19 pandemic	Wang et al., China https://www.thelancet.com/journals/lancom/article/PIIS0140-6736(20)30561-4/fulltext	Public Health/Epidemiology	<p>-> Relevant lessons from the 2014–16 outbreak of Ebola virus disease in west Africa</p> <p>-> Much like Ebola, the early symptoms of COVID-19, including fever, myalgia, and fatigue, might be confused with malaria and lead to challenges in early clinical diagnosis</p>
The Lancet 16MAR2020	Screening of faecal microbiota transplant donors during the COVID-19 outbreak: suggestions for urgent updates from an international expert panel	Ianiro et al., Italy https://www.thelancet.com/journals/langas/article/PIIS2468-1253(20)30082-0/fulltext	Public Health/Epidemiology	<p>-> Before each donation, physicians should screen for two main items: the presence of typical COVID-19 symptoms</p> <p>-> In endemic countries, the RT-PCR assay should be considered in all donors</p> <p>-> Stool banks should retrospectively check the health status of the donor before using frozen faeces, according to local epidemiology, to avoid further potential spreading of SARS-CoV-2</p>
JAMA 13MAR2020	Risk Factors Associated With Acute Respiratory Distress Syndrome and Death in Patients With Coronavirus Disease 2019 Pneumonia in Wuhan, China	Wu et al., China https://jamanetwork.com/journals/jamainternalmedicine/fullarticle/2763184?resultClick=1	Clinic	<p>-> 201 patients included in the study</p> <p>Risk factors to develop ARDS:</p> <ul style="list-style-type: none"> • Older age, neutrophilia, and organ and coagulation dysfunction (eg, higher LDH and D-dimer) • Associated with ARDS but not death: Comorbidities, lymphocyte counts, CD3 and CD4 T-cell counts, AST, prealbumin, creatinine, glucose, low-density lipoprotein, serum ferritin, PT • Although high fever was positively associated with development of ARDS, it was negatively related to death • Higher CD3 and CD4 T-cell counts might protect patients from developing ARDS • Persistent and gradual increases in lymphocyte responses might be required for effective immunity against SARS-CoV-2 infection.
Euro Surv 12MAR2020	Retrospective analysis of the possibility of predicting the COVID-19 outbreak from Internet searches and social media data, China, 2020	Li et al., China https://www.eurosurveillance.org/content/10.2807/1560-7917.ES.2020.25.10.2000199	Public Health/Epidemiology	<p>To predict the development of this outbreak as early and as reliably as possible</p> <p>-> Data obtained from Google Trends, Baidu Index and Sina Weibo Index on searches for the keywords ‘coronavirus’ and ‘pneumonia’ correlated with the published NHC data on daily incidence of laboratory-confirmed and suspected cases of COVID-19, with the maximum $r > 0.89$.</p> <p>-> Peak interest for these keywords in Internet search engines and social media data was 10–14 days earlier than the incidence peak of COVID-19 published by the NHC.</p> <p>-> The lag correlation showed a maximum correlation at 8–12 days for laboratory-confirmed cases and 6–8 days for suspected cases</p>
The Lancet 12MAR2020	SARS-CoV-2 RNA more readily detected in induced sputum than in throat swabs of convalescent COVID-19 patients	Han et al., China https://www.thelancet.com/journals/lanin/article/PIIS1473-3099(20)30174-2/fulltext	Diagnostic	<p>-> 2 cases in convalescence</p> <p>-> Both negative with throat swab and anal swabs</p> <p>-> Positive in induced sputum</p> <p>To reduce the risk of disease spread, viral RNA tests of induced sputum, not throat swabs, should be assessed as a criterion for releasing COVID-19 patients.</p>

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The Lancet 12MAR2020	Real estimates of mortality following COVID-19 infection	Baud et al., Switzerland https://www.thelancet.com/action/showPdf?pii=S1473-3099%2820%2930195-X	Public Health/Epidemiology	Mortality rate estimates are based on the number of deaths relative to number of confirmed cases of infection -> not representative of actual death rate. Real rates: - 5-6% for China - 15-2% outside China Current figures might underestimate the potential threat of COVID-19 in symptomatic patients
The Lancet 11MAR2020	Are patients with hypertension and diabetes mellitus at increased risk for COVID-19 infection?	Fang et al., Switzerland https://www.thelancet.com/journals/lanres/article/PIIS2213-2600(20)30116-8/fulltext	Clinic	Patients with cardiac diseases, hypertension, or diabetes , who are treated with ACE2-increasing drugs , may be at higher risk for severe COVID-19 infection -> They should be monitored for ACE2-modulating medications , such as ACE inhibitors or ARBs. -> No evidence to suggest that antihypertensive calcium channel blockers increased ACE2 expression or activity : these could be a suitable alternative treatment in these patients.
The Lancet 11MAR2020	Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study.	Zhou et al., China https://www.thelancet.com/journals/lanres/article/PIIS2213-2600(20)30566-3/fulltext	Clinic	-> 191 patients: 137 discharged and 54 died 1- Comorbidity: 48%, with hypertension (30%), diabetes (19%), coronary heart disease (8%). 2- Death associated with older age, higher SOFA score, d-dimer greater than 1 µg/mL on admission. 3- Viral shedding: median 20 days in survivors, otherwise until death. Longest viral shedding: 37 days
The Lancet 11MAR2020	Early dynamics of transmission and control of COVID-19: a mathematical modelling study	Kucharski et al., UK https://www.thelancet.com/journals/lanres/article/PIIS2213-2600(20)30144-4/fulltext	Public Health/Epidemiology	Calculation the probability that newly introduced cases might generate outbreaks in other areas. -> Estimations: The median daily reproduction number (R_t) in Wuhan declined from 2-35 (95% CI 1-15-4-77) 1 week before travel restrictions were introduced on Jan 23, 2020, to 1-05 (0-41-2-39) 1 week after. -> In locations with similar transmission potential to Wuhan in early January, once there are at least four independently introduced cases , there is a more than 50% chance the infection will establish within that population.
JAMA 11MAR2020	Detection of SARS-CoV-2 in Different Types of Clinical Specimens	Wang et al., China https://jamanetwork.com/journals/jama/fullarticle/2762997	Diagnostic	-> 1070 specimens collected from 205 patients POSITIVITY by RT-PCR: Bronchoalveolar lavage fluid (93%) Sputum (72%) Nasal Swabs (63%) Fibrobronchoscope brush biopsy (46%) Pharyngeal swabs (32%) Feces (29%) Blood (1%) Urine (0%)
Sci Rep 11MAR2020	A high ATP concentration enhances the cooperative translocation of the SARS coronavirus helicase nsP13 in the unwinding of duplex RNA	Jang et al., Republic of Korea https://www.nature.com/articles/s41598-020-61432-1	Fundamental Research	To know: RNA Helicase nsP13 is essential for the viral RNA replication of the SARS coronavirus Here: ->RNA helicase nsP13 would have higher binding affinity to RNA than to DNA, at same ATP concentrations. -> The open state of nsP13 binding with a higher affinity to RNA than to DNA, is a considerably energy-consuming reaction ->Unwinding of duplex RNA by nsP13 is a considerably energy-consuming reaction SARS coronavirus nsP13 may require more ATPs to promote stable helicase translocation necessary for delicate RNA replication.

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Emerge Inf Dis 09MAR2020	Detection of Novel Coronavirus by RT-PCR in Stool Specimen from Asymptomatic Child, China	Tang et al., China https://wwwnc.cdc.gov/eid/article/26/6/20-0301_article	Public Health/Epidemiology	<ul style="list-style-type: none"> -> Asymptomatic child positive for COVID-19 by RT-PCR in stool, 17 days after the last virus exposure -> Still positive 9 days after that (in stool) -> Never positive in respiratory tracts specimens -> no data on urine and blood -> The child might have transmitted the virus to numerous persons. Stool from COVID-19 patients might serve as another vehicle for virus transmission
Clin Inf Dis 09MAR2020	In Vitro Antiviral Activity and Projection of Optimized Dosing Design of Hydroxychloroquine for the Treatment of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2)	Yao et al., China https://academic.oup.com/cid/advance-article/doi/10.1093/cid/ciaa237/5801998	Therapeutic	<ul style="list-style-type: none"> -> Vero cells were treated by Chloroquine and Hydroxychloroquine before (prophylaxis) and after (anti-viral) infection by SARS-CoV-2. -> EC50 are calculated -> Hydroxychloroquine has superior antiviral and prophylactic activity than chloroquine -> Physiologically-based pharmacokinetic (PBPK) -> to predict (in silico) drug concentrations in lung, plasma and blood. -PBPK model has acceptable prediction accuracy. -Kinetics were simulated with different scenarios of dose regimens -Dose regimen was optimized (recommendations).
Science 06MAR2020	The effect of travel restrictions on the spread of the 2019 novel coronavirus (COVID-19) outbreak.	Chinazzi et al., USA https://science.sciencemag.org/content/early/2020/03/05/science.aba97571ong	Public Health/Epidemiology	<ul style="list-style-type: none"> -> Global metapopulation disease transmission model to project the impact of travel limitations on the national and international spread of the epidemic. -> Travel quarantine of Wuhan delayed the overall epidemic progression by only 3 to 5 days in Mainland China -> More marked effect <u>at the international scale</u>, where case importations were reduced by nearly 80% until mid February -> Sustained 90% travel restrictions to and from Mainland China only modestly affect the epidemic trajectory unless combined with a 50% or higher reduction of transmission in the community -> Potential uses for the definition of optimized containment schemes and mitigation policies that includes the local and international dimension of the COVID-19 epidemic
EuroSurveillance 05MAR2020	Evaluation of a quantitative RT-PCR assay for the detection of the emerging coronavirus SARS-CoV-2 using a high throughput system	Pfefferle et al. Germany https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7068162	Diagnostic	<ul style="list-style-type: none"> Assessment of a molecular assay for the detection of SARS-CoV-2 on a high-throughput platform, the cobas 6800, using the 'open channel' for integration of a laboratory-developed assay. Evaluated samples are swab samples. Good analytical performance in clinical specimens. The fully automated workflow enables high-throughput testing with minimal hands-on time, while offering fast and reliable results. Special notes : by its nature as a screening test targeting only a single viral gene, positive results should always be confirmed with an independent PCR as recommended]. Importance of closely coordinating with local reference centres and public health authorities for determining clinical indications for testing
Cell 04MAR2020	SARS-CoV-2 Cell Entry Depends on ACE2 and TMPRSS2 and Is Blocked by a Clinically Proven Protease Inhibitor	Hoffman et al., Germany https://www.cell.com/cell/fulltext/S0092-8674(20)30229-4?_returnURL=https%3A%2F%2Flinkinghub.elsevier.com%2Fretrieve%2Fpii%2FS0092867420302294%3Fshoal%3Dtrue	Therapeutic	<ul style="list-style-type: none"> -> Priming of S proteins by host cell proteases (TMPRSS2) is essential for viral entry into cells. -> ACE 2 can be blocked by a clinically proven inhibitor of TMPRSS2 -> The study suggests that antibody responses raised against SARS-CoV could at least partially protect against SARS-CoV-2 infection

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Science 04MAR2020	Structural basis for the recognition of the SARS-CoV-2 by full-length human ACE2	Yan et al., China https://science.sciencemag.org/content/early/2020/03/03/science.abb2762/ta-b-pdf	Fundamental Research	<ul style="list-style-type: none"> -> Cryo-EM structures of human ACE2, in the presence of a neutral amino acid transporter BOAT1, with or without the receptor binding domain (RBD) of the surface spike glycoprotein (S protein) of SARS-CoV-2 -> ACE2 may be a homodimer even in the absence of BOAT1 -> A dimeric ACE2 can accommodate two S protein trimers, each through a monomer of ACE2 -> Structure-based rational design of binders with enhanced affinities to either ACE2 or the S protein of the coronaviruses may facilitate development of decoy ligands or neutralizing antibodies for suppression of viral infection.
J Clin Microbiol 04MAR2020	Multicenter Evaluation of the QIAstat-Dx Respiratory Panel for the Detection of Viruses and Bacteria in Nasopharyngeal Swab Specimens	Leber et al., USA https://jcm.asm.org/content/early/2020/02/28/JCM.00155-20.long	Diagnostic	<ul style="list-style-type: none"> -> Multiplex <i>in vitro</i> diagnostic test for the qualitative detection of 20 pathogens directly from nasopharyngeal swab specimens. -> Results available in approximately 69 minutes -> Pathogens identified: adenovirus, coronavirus 229E, coronavirus HKU1, coronavirus NL63, coronavirus OC43, human metapneumovirus A+B, influenza A, influenza A H1, influenza A H3, influenza A H1N1/2009, influenza B, parainfluenza virus 1, parainfluenza virus 2, parainfluenza virus 3, parainfluenza virus 4, rhinovirus/enterovirus, respiratory syncytial virus A+B, Bordetella pertussis, Chlamydia pneumoniae and Mycoplasma pneumoniae -> Compared to the BioFire FilmArray Respiratory Panel version 1.7: percent agreement: 99,5% . negative percent agreement of ≥ 97.9% Robust and accurate assay for rapid, comprehensive testing for respiratory pathogens.
Sci. China Life Sci. 04MAR2020	Clinical characteristics of 24 asymptomatic infections with COVID-19 screened among close contacts in Nanjing, China	https://link.springer.com/article/10.1007%2Fs11427-020-1661-4	Clinic	<ul style="list-style-type: none"> -> Laboratory-confirmed positive for the COVID-19 (pharyngeal swab) -> No obvious symptoms at time of screening (all of them) -> 20.8% developed symptoms (fever, cough, fatigue, etc.) -> 50.0% cases showed typical CT images of ground-glass chest -> 20.8% presented stripe shadowing in the lungs -> 29.2% cases showed normal CT image and had no symptoms during hospitalization (these cases were younger) -> Epidemiological investigation revealed asymptomatic transmission
JAMA 04MAR2020	Air, Surface Environmental, and Personal Protective Equipment Contamination by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) From a Symptomatic Patient	Ong et al., Singapore https://jamanetwork.com/journals/jama/fullarticle/2762692?resultClick=1	Public Health/Epidemiology	<ul style="list-style-type: none"> Extensive environmental contamination by 1 SARS-CoV-2 patient with mild upper respiratory tract involvement -> Toilet bowl and sink samples were positive -> Swabs taken from the air exhaust outlets tested positive -> Air samples were negative -> Risk of transmission from contaminated footwear is likely low: negative results in the anteroom and clean corridor Limit of the study: viral culture was not done to demonstrate viability
Nat Sci Rev 03MAR2020	On the origin and continuing evolution of SARS-CoV-2	Tang et al., China https://academic.oup.com/nsr/advance-article/doi/10.1093/nsr/nwaa036/5775463?searchres=ult=1	Genomic	<ul style="list-style-type: none"> -> Assessment of the molecular phylogeny and the divergence between SARS-CoV-2 and related coronaviruses. -> Population genetic analyses of 103 genomes of SARS-CoV-2 indicate that there are two major types of viruses (designated L and S) currently circulating between humans. -> The L type is predominant (70% against 30% for S type). -> This article suggests that the L type is more aggressive.

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JAMA 03MAR2020	Epidemiologic Features and Clinical Course of Patients Infected With SARS-CoV-2 in Singapore	Young et al., Singapore https://jamanetwork.com/journals/jama/fullarticle/2762688	Clinic	<p>-> 18 patients diagnosed with SARS-CoV-2 infection in Singapore between January 23 and February 3, 2020</p> <p>-> Respiratory tract infection with prolonged viral shedding from the nasopharynx of 7 days or longer in 15 patients (83%)</p> <p>-> Supplemental oxygen was required in 6 patients (33%), 5 of whom were treated with lopinavir-ritonavir, with variable clinical outcomes following treatment.</p>
Int J Infect Dis 02MAR2020	Recurrence of positive SARS-CoV-2 RNA in COVID-19: A case report	Chen et al., China https://www.ijidonline.com/article/S1201-9712(20)30122-3/pdf	Virology	<p>- 46-year-old woman with multiple patchy ground glass opacities in bilateral subpleural areas by CT</p> <p>- Oropharyngeal swab test was positive by RT-PCR.</p> <p>-> Received symptomatic treatment and antimicrobial therapy including oseltamivir, arbidol, Lopinavir/ritonavir and moxifloxacin</p> <p>-> 6 testing from 28 Jan to 17FEB, all negative but one the 2FEB Discharged on 9FEB and testing remained negative during follow-up.</p> <p>SARS-CoV-2 RNA of respiratory tract specimen may be persistent or recurrent positive during the course.</p>
Jour of Infect 29FEB2020	Identification of the hyper-variable genomic hotspot for the novel coronavirus SARS-CoV-2	Wen et al., China https://www.journalofinfection.com/article/S0163-4453(20)30108-0/pdf	Genomic	<p>-> Confirmation of the relationship of SARS-CoV-2 with other beta coronaviruses on the amino acid level.</p> <p>-> Hyper-variable genomic hotspot established in SARS-CoV-2 population at the nucleotide but not the amino acid level -> means no beneficial mutations.</p> <p>-> Mutations in nsp1, nsp3, nsp15, and gene S would be associated with the SARS-CoV-2 epidemic (compared with RaTG13) / required for human adaptation?</p>
J Med Virol 28FEV2020	Development of Epitope-Based Peptide Vaccine Against Novel Coronavirus 2019 (SARS-COV-2): Immunoinformatics Approach	Bhattacharya et al., India https://onlinelibrary.wiley.com/doi/abs/10.1002/jmv.25736	Vaccine	<p>1-> Characterization of the spike glycoprotein to obtain immunogenic epitopes</p> <p>2-> Immunoinformatic analysis of 13 MHC I and 3 MHC II epitopes which have antigenic properties</p> <p>3-> These identified epitopes are candidate to formulate a multi-epitopic peptide vaccine.</p> <p>Need for <i>in vitro</i> and <i>in vivo</i> validations</p>
The NEJM 28FEB2020	Clinical Characteristics of Coronavirus Disease 2019 in China	Ni et al., China https://www.nejm.org/doi/pdf/10.1056/NEJMoa2002032?articleTools=true&downloadfile=showPdf&articleTools=true&doi=10.1056/NEJMoa2002032	Clinic	<p>Median age : 47 years / Female: 41.9%</p> <p>Primary composite end point (admission in ICU, use of mechanical ventilation and death) in 6.1%, with 5.0% in ICU, 2.3% with invasive mechanical ventilation, and 1.4% who died.</p> <p>History of direct contact with wildlife: 1.9% Among nonresidents of Wuhan, 72.3% had contact with residents of Wuhan, including 31.3% who had visited the city.</p> <p>Most common symptoms: fever (43.8% on admission and 88.7% during hospitalization) and cough (67.8%). Diarrhea was uncommon (3.8%).</p> <p>Median incubation period: 4 days (interquartile range, 2 to 7).</p> <p>CT: ground-glass opacity was the most common radiologic: 56.4%.</p> <p>No radiographic or CT abnormality: 17.9% with nonsevere disease and 2.9% with severe disease.</p> <p>Lymphocytopenia: 83.2%</p>

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EuroSurv 27FEB2020	Early transmission patterns of coronavirus disease 2019 (COVID-19) in travellers from Wuhan to Thailand, January 2020	Okada et al., Thailand https://www.eurosurveillance.org/content/10.2807/1560-7917.ES.2020.25.8.2000097	Public Health/Epidemiology	<p>-> 2 women arriving in Thailand at different times (8 and 13 January)</p> <p>-> The two viral genomes are identical to four sequences from Wuhan, while no direct link to the Huanan Seafood Market.</p> <p>-> Identical genomes of up to 30 kb are rare and a strong sign of recent transmission linkage</p> <p>-> Data suggest that transmission within Wuhan beyond the Huanan Seafood Market is likely to have occurred in the first week of January or earlier.</p>
J Clin Med 27FEB2020	Epidemiological Identification of A Novel Pathogen in Real Time: Analysis of the Atypical Pneumonia Outbreak in Wuhan, China, 2019—2020	Jung et al., Japan https://www.mdpi.com/2077-0383/9/3/637	Public Health/Epidemiology	<p>-> Non-virological descriptive characteristics could have determined that the outbreak is caused by a novel pathogen in advance of virological testing.</p> <p>-> Characteristics of the outbreak were collected in real time and compared with characteristics of eleven pathogens that have previously caused cases of atypical pneumonia.</p> <p>-> The probability that a new virus was driving the outbreak was assessed as over 29% on 31 December 2019, one week before virus identification.</p>
The Lancet 27FEB2020	Secondary attack rate and superspreading events for SARS-CoV-2	Liu et al., UK https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)30462-1/fulltext	Public Health/Epidemiology	<p>The Ro value only captures the average dynamics of transmission.</p> <p>The secondary attack rate (SAR) is the probability that an infection occurs among susceptible people within a specific group.</p> <p>SAR among close contacts would be of 35% (95% CI 27–44).</p> <p>-> An infection with a high household SAR but a modest R0 suggests transmission is driven by a relatively small number of high-risk contacts.</p> <p>-> A large household SAR further suggests that between-household transmission risk is lower; otherwise the observed R0 would be larger.</p> <p>More data are needed.</p>
The Lancet 27FEB2020	COVID-19: combining antiviral and anti-inflammatory treatments COMMENT	Stebbing et al., UK https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(20)30132-8/fulltext	Therapeutic	<p>-> COVID-19 characterised by an overexuberant inflammatory response</p> <p>SARS -> viral load is not correlated with the worsening of symptoms</p> <p>-> Inhibition of numb-associated kinase (NAK) family would reduce viral infection in vitro (inhibit clathrin-mediated endocytosis and thereby inhibit viral infection of cells)</p> <p>-> JAK-STAT signalling inhibitors, could be effective against the consequences of the elevated levels of cytokines (including interferon) typically observed in people with COVID-19</p> <p>-> Baricitinib is a NAK inhibitor (anti-viral)</p> <p>-> Baricitinib, fedratinib, and ruxolitinib are JAK inhibitors (anti-inflammatory)</p> <p>-> Baricitinib is the best of the group</p>
The Lancet 27FEB2020	Positive RT-PCR Test Results in Patients Recovered From COVID-19	Lan et al., China https://jamanetwork.com/journals/jama/fullarticle/2762452	Public Health/Epidemiology	<p>Little attention has been paid to the follow-up of recovered patients so far.</p> <p>4 patients with COVID-19 who met criteria for hospital discharge or discontinuation of quarantine in China (absence of clinical symptoms and radiological abnormalities and 2 negative RT-PCR test results) had positive RT-PCR test results 5 to 13 days later, while they were still asymptomatic.</p>

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The Lancet 27FEB2020	Convalescent plasma as a potential therapy for COVID-19 COMMENT	Chen et al., China https://www.thelancet.com/pdfs/journals/laninf/PIIS1473-3099(20)30141-9.pdf	Therapeutic	-> In 2014, the use of convalescent plasma collected from patients who had recovered from Ebola virus disease was recommended by WHO as an empirical treatment during outbreaks. -> A protocol for the use of convalescent plasma in the treatment of MERS coronavirus was established in 2015. -> H1N1 : significant reduction of relative risk of mortality / no adverse event . -> and other studies Antibodies from convalescent plasma might suppress viraemia
Emerg Microb Infects 26FEB2020	Detectable 2019-nCoV viral RNA in blood is a strong indicator for the further clinical severity	Chen et al., China https://www.tandfonline.com/doi/full/10.1080/22221751.2020.1732837	Clinic	-> All patients (n=6 / 57) with detectable viral RNA in the blood progressed to severe symptom stage, indicating a strong correlation of serum viral RNA with the disease severity (p-value = 0.0001). -> 8 of the 11 patients with anal swab virus-positive was in severe clinical stage . -> Concentration of viral RNA in the anal swab was higher than in the blood: virus might replicate in the digestive tract
The Lancet, 26FEB2020	The psychological impact of quarantine and how to reduce it: rapid review of the evidence	Brooks et al., UK https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)30460-8/fulltext	HSS/Political	-> Information is key; people who are quarantined need to understand the situation -> The quarantine period should be short and the duration should not be changed unless in extreme circumstances -> Most of the adverse effects come from the imposition of a restriction of liberty; voluntary quarantine is associated with less distress and fewer long-term complications -> Public health officials should emphasise the altruistic choice of self-isolating
Viruses 25FEB2020	Preliminary Identification of Potential Vaccine Targets for the COVID-19 Coronavirus (SARS-CoV-2) Based on SARS-CoV Immunological Studies	Ahmed et al., China https://www.mdpi.com/1999-4915/12/3/254	Vaccine	-> High genetic similarity between SARS-CoV-2 and SARS-Co- -> Identification of a set of B cell and T cell epitopes derived from the spike (S) and nucleocapsid (N) proteins that map identically to SARS-CoV-2 proteins. -> No mutation has been observed in these epitopes (as of 21 February 2020). -> Immune targeting of these epitopes may offer protection against this novel virus
EuroSurv 25FEV2020	Differential diagnosis of illness in patients under investigation for the novel coronavirus (SARS-CoV-2), Italy, February 2020.	Bordi et al., Italy https://www.eurosurveillance.org/content/10.2807/1560-7917.ES.2020.25.8.2000170	Public Health/Epidemiology	-> Similarity of symptoms shared with more common respiratory infections. -> Broad screening requested. -> Influenza virus infections: 28.5% of all suspected cases of SARS-CoV-2 infection. -> Alternative diagnoses may clarify an individual patient's risk and may allow adjusting public health containment measures.
The Lancet 25FEB2020	Potential association between COVID-19 mortality and health-care resource availability	Ji et al., China https://www.thelancet.com/journals/laniglo/article/PIIS2214-109X(20)30068-1/fulltext	Public Health/Epidemiology	Plotting mortality against the incidence of COVID-19 (cumulative number of confirmed cases since the start of the outbreak, per 10 000 population) showed a significant positive correlation, suggesting that mortality is correlated with health-care burden
The Lancet 24FEB2020	COVID-19 control in China during mass population movements at New Year	Chen et al., China https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)30421-9/fulltext	Public Health/Epidemiology	Several lessons that can be drawn from China's extension of the Lunar New Year holiday: 1-> Countries should consider periods of recommended or mandatory closure of non-essential workplaces and public institutions — to slow the rate of transmission. 2-> To tailor the design of these actions according to specific epidemic characteristics (incubation period and transmission routes). 3-> This is to prevent people with asymptomatic infections from spreading the disease. As such, governments should use the closure period for information and education campaigns, community screening, active contact tracing, and isolation and quarantine to maximise impact.

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J Clin Med 24FEB2020	Assessing the Impact of Reduced Travel on Exportation Dynamics of Novel Coronavirus Infection (COVID-19)	Anzai et al., Japan https://www.mdpi.com/2077-0383/9/2/601	Public Health/Epidemiology	<ul style="list-style-type: none"> -> From 28 January to 7 February 2020, around 226 exported cases were prevented (=70.4% reduction in incidence) -> Reduced probability of a major epidemic in Japan: from 7% to 20% (=median time delay: of 2 days) -> Depending on the scenario, the estimated delay may be less than one day. As the delay is small, the decision to control travel volume through restrictions on freedom of movement should be balanced between the resulting estimated epidemiological impact and predicted economic fallout.
Cell Discov 24FEB2020	Comparative genetic analysis of the novel coronavirus (2019-nCoV/SARS-CoV-2) receptor ACE2 in different populations	Cao et al., China https://jcm.asm.org/content/early/2020/02/28/jcm.00155-20.long	Fundamental Research	<ul style="list-style-type: none"> -> Previous studies demonstrated the positive correlation of ACE2 expression and the infection of SARS-CoV in vitro -> Here: Systematic analysis of coding-region variants in ACE2 and the eQTL variants (may affect the expression of ACE2) among different populations (GTEx database)/ -> The East Asian populations have much higher AFs in the eQTL variants associated with higher ACE2 expression in tissues which may suggest different susceptibility or response to 2019-nCoV/SARS-CoV-2 from different populations under the similar conditions. -> No direct evidence supporting the existence of coronavirus S-protein binding-resistant ACE2 mutants in different populations.
The Lancet 24FEB2020	Clinical course and outcomes of critically ill patients with SARS-CoV-2 pneumonia in Wuhan, China: a single-centered, retrospective, observational study	Xiaobo Yang et al., China https://www.thelancet.com/journals/lanres/article/PIIS2213-2600(20)30079-5/fulltext	Clinic	<ul style="list-style-type: none"> - Mortality is high. The survival term of the non-survivors is likely to be within 1–2 weeks after ICU admission. - Older patients (>65 years) with comorbidities and ARDS are at increased risk of death.
The Lancet 24FEB2020	Viral load of SARS-CoV-2 in clinical samples	Pan et al., China https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(20)30113-4/fulltext	Virology	<ul style="list-style-type: none"> - The viral loads in throat swab and sputum samples peaked at around 5–6 days after symptom onset, ranging from around 104 to 107 copies per mL during this time - Sputum samples generally showed higher viral loads than throat swab samples.
The Lancet 24FEB2020	COVID-19 pneumonia: what has CT taught us?	Lee et al., China https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(20)30134-1/fulltext	Diagnostic	<ul style="list-style-type: none"> - The predominant CT findings included ground-glass opacification, consolidation, bilateral involvement, and peripheral and diffuse distribution. - More research is needed to correlate of CT findings with clinical severity and progression, the predictive value of baseline CT or temporal changes for disease outcome, and the sequelae of acute lung injury induced by COVID-19.
J Med Virol 21FEB2020	COVID-2019: the role of the nsp2 and nsp3 in its pathogenesis.	Angeletti et al., Rome, Italy https://onlinelibrary.wiley.com/doi/abs/10.1002/jmv.25719	Fundamental Research	<p>The Open Reading Frame 1ab (ORF1ab) of COVID-2019 has been analyzed to evidence the presence of mutation caused by selective pressure on the virus.</p> <p>Which are the probably most common sites undergoing to an aminoacidic change ?</p> <p>-> Insight of some important proteins of the COVID-2019 that are involved in the mechanism of viral entry and viral replication</p> <p>Results: Both nsp2 and nsp3 are under selective pressure. nsp2-> could explain why this virus is more contagious than SARS nsp 3-> could suggest a potential mechanism differentiating COVID-2019 from SARS</p>

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Radiology 20 FEB 2020	Chest CT Findings in Coronavirus Disease-19 (COVID-19): Relationship to Duration of Infection.	Bernheim et al., https://pubs.rsna.org/doi/10.1148/radiol.2020200463	Diagnostic	Frequency of CT findings is related to infection time course.
The Lancet, 20 FEB 2020	Preparedness and vulnerability of African countries against importations of COVID-19: a modelling study.	Gilbert et al., Vittoria's team https://www.thelancet.com/journals/laninf/article/PIIS0140-6736(20)30411-6/fulltext	Public Health/Epidemiology	- Highest importation risk: Egypt, Algeria, and South Africa -> moderate to high capacity to respond to outbreaks - Moderate risk: Nigeria, Ethiopia, Sudan, Angola, Tanzania, Ghana, and Kenya -> variable capacity and high vulnerability
The Lancet 19FEB2020	Asymptomatic cases in a family cluster with SARS-CoV-2 infection	Pan et al., China https://www.thelancet.com/journals/laninf/article/PIIS0140-6736(20)30114-6/fulltext	Public Health/Epidemiology	- In this family cluster, although all individuals tested positive for SARS-CoV-2 infection on qRT-PCR, only patient 1 showed clinical symptoms, decreased lymphocyte count, and abnormal chest CT images. - However, any of the three individuals could have been the first one to become infected and thus transmitted the virus to the other two family members.
The Lancet 19FEB2020	Enteric involvement of coronaviruses: is faecal-oral transmission of SARS-CoV-2 possible?	Yeo et al., Singapore https://www.thelancet.com/journals/langas/article/PIIS2468-1253(20)30048-0/fulltext	Virology	- Considering the evidence of faecal excretion for both SARS-CoV and MERS-CoV, and their ability to remain viable in conditions that could facilitate faecal-oral transmission, it is possible that SARS-CoV-2 could also be transmitted via this route. ->When SARS-CoV was seeded into sewage water obtained from the hospitals in a separate experiment, the virus was found to remain infectious for 14 days at 4°C, but for only 2 days at 20°C. SARS-CoV can survive for up to 2 weeks after drying, remaining viable for up to 5 days at temperatures of 22–25°C and 40–50% relative humidity, with a gradual decline in virus infectivity thereafter. Viability of the SARS-CoV virus decreased after 24 h at 38°C and 80–90% relative humidity. -> MERS-CoV is viable in low temperature, low humidity conditions. The virus was viable on different surfaces for 48 h at 20°C and 40% relative humidity, although viability decreased to 8 h at 30°C and 80% relative humidity conditions.
THE NEJM, 19FEB2020	SARS-CoV-2 Viral Load in Upper Respiratory Specimens of Infected Patients	Zou et al., China https://www.nejm.org/doi/full/10.1056/NEJMc2001737	Virology	- The higher viral loads were detected soon after symptom onset. - Higher viral loads detected in the nose than in the throat. - Our analysis suggests that the viral nucleic acid shedding pattern of patients infected with SARS-CoV-2 resembles that of patients with influenza and appears different from that seen in patients infected with SARS-CoV. - The viral load that was detected in the asymptomatic patient was similar to that in the symptomatic patients , which suggests the transmission potential of asymptomatic or minimally symptomatic patients.
Biosci Trends, 19FEB2020	Breakthrough: Chloroquine phosphate has shown apparent efficacy in treatment of COVID-19 associated pneumonia in clinical studies.	Gao et al., https://www.ncbi.nlm.nih.gov/pubmed/32074550	Therapeutic	Chloroquine phosphate , an old drug for treatment of malaria, is shown to have apparent efficacy and acceptable safety against COVID-19 associated pneumonia in multicenter clinical trials conducted in China. (DATA NOT SHOWN !). The drug is recommended to be included in the next version of the Guidelines for the Prevention, Diagnosis, and Treatment of Pneumonia Caused by COVID-19 issued by the National Health Commission of the People's Republic of China for treatment of COVID-19 infection in larger populations in the future.

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J Infect Dis. 18FEB2020	A familial cluster of infection associated with the 2019 novel coronavirus indicating potential person-to-person transmission during the incubation period.	Yu et al., China https://academic.oup.com/jid/advance-article/doi/10.1093/jids/iaa077/5739751	Public Health/Epidemiology	Familial cluster of four patients in Shanghai. One was 88 years old man with moving difficulties and was only exposed to his asymptomatic family members who developed symptoms later . The epidemiological evidence has shown a potential transmission of the 2019-nCoV during the incubation period.
The Lancet 18FEB2020	Tracking online heroisation and blame in epidemics COMMENT	Atlani Duault et al., France https://www.thelancet.com/action/showPdf?pii=S2468-2667%2820%2930033-5	HSS/Politics	-> Gathering online data on local perceptions has the potential to help public authorities mount more robust responses and better targeted health communications -> It is important to track the evolving dynamics of blame in real time, both to correct inaccurate information and to respond to online scapegoating . -> Trust is a crucial support to public health systems. Public health authorities need to be aware of « complex geographies of hope and blame » while planning responses to the epidemic.
Biochem Biophys Res Comm 17 FEB 2020	Structure analysis of the receptor binding of 2019-nCoV	Chen et al., China and USA https://www.sciencedirect.com/science/article/pii/S006291X20303399	Fundamental Research	Structural analysis of the receptor binding domain (RBD) -> 72% identity with SARS CoV / Higher affinity with ACE 2. ACE2 is widely expressed with conserved primary structures <u>throughout the animal kingdom (possible hosts ?)</u> Since ACE2 is predominantly expressed in intestines, testis, and kidney, fecal-oral and other routes of transmission are also possible . Finally, antibodies and small molecular inhibitors that can block the interaction of ACE2 with RBD should be developed to combat the virus.
J Clin Med 17 FEB 2020	Incubation Period and Other Epidemiological Characteristics of 2019 Novel Coronavirus Infections with Right Truncation: A Statistical Analysis of Publicly Available Case Data.	Linton et al., Japan https://www.mdpi.com/2077-0383/9/2/538	Public Health/Epidemiology	Incubation period falls within the range of 2–14 days with 95% confidence and has a mean of around 5 days. The mean time from illness onset to hospital admission (for treatment and/or isolation) was estimated at 3–4 days without truncation and at 5–9 days.
PNAS, 13FEB2020	Prophylactic and therapeutic remdesivir (GS-5734) treatment in the rhesus macaque model of MERS-CoV infection	De Wit et al., USA https://www.pnas.org/content/early/2020/02/12/1922083117	Therapeutic	- 24 h prior to inoculation -> completely prevented MERS-CoV-induced clinical disease , strongly inhibited MERS-CoV replication in respiratory tissues, and prevented the formation of lung lesions. - 12 h postinoculation -> clear clinical benefit , with a reduction in clinical signs, reduced virus replication in the lungs, and decreased presence and severity of lung lesions. - Remdesivir may be considered for SARS-CoV -2
The Lancet 12 FEB 2020	What are the risks of COVID-19 infection in pregnant women?	Qiao et al., China https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)30365-2/fulltext	Clinic	The clinical characteristics reported in pregnant women with confirmed COVID-19 infection are similar to those reported for non-pregnant adults with confirmed COVID-19 infection in the general population and are indicative of a relatively optimistic clinical course and outcomes for COVID-19 infection compared with SARS-CoV-1 infection.
The Lancet 12FEB2020	Clinical characteristics and intrauterine vertical transmission potential of COVID-19 infection in nine pregnant women: a retrospective review of medical records	Chen et al., China https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)30360-3/fulltext	Clinic	Evidence of intrauterine vertical transmission was assessed by testing for the presence of SARS-CoV-2 in amniotic fluid, cord blood, and neonatal throat swab samples. All samples tested negative None of the 9 patients developed severe COVID-19 pneumonia or died.
Cell Res 4FEB2020	Remdesivir and chloroquine effectively inhibit the recently emerged novel coronavirus (2019-nCoV) in vitro	Wang et al., China https://www.nature.com/articles/s41422-020-0282-0	Therapeutic	Remdesivir and chloroquine are highly effective in the control of 2019-nCoV infection in vitro . These compounds have been used in human patients with a safety track record and shown to be effective against various ailments. They should be assessed in human patients suffering from the novel coronavirus disease .

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Euro Surveill 6FEB2020	Effectiveness of airport screening at detecting travellers infected with novel coronavirus (2019-nCoV).	Quilty et al., UK https://www.eurosurveillance.org/content/10.2807/1560-7917.ES.2020.25.5.2000080	Public Health/Epidemiology	Estimation: 46% of infected travellers would not be detected , depending on incubation period, sensitivity of exit and entry screening, and proportion of asymptomatic cases. -> Airport screening is unlikely to detect a sufficient proportion of 2019-nCoV infected travellers to avoid entry of infected travellers.
The Lancet 03FEB2020	Baricitinib as potential treatment for 2019-nCoV acute respiratory disease	Richardson et al., UK https://www.thelancet.com/pdfs/journals/lancet/PIIS0140-6736(20)30304-4.pdf	Therapeutic	The receptor that 2019-nCoV uses to infect lung cells might be ACE2, a cell-surface protein on cells in the kidney, blood vessels, heart, and, importantly, lung AT2 alveolar epithelial cells. One of the known regulators of endocytosis is the AP2-associated protein kinase 1 (AAK1). The plasma concentration of Baricitinib on therapeutic dosing (either as 2 mg or 4 mg once daily) is sufficient to inhibit AAK1, we suggest it could be trialled.
Emerge Microbes Infect 03FEB2020	Potent binding of 2019 novel coronavirus spike protein by a SARS coronavirus-specific human monoclonal antibody.	Tian et al., China https://www.biorxiv.org/content/10.1101/2020.01.28.923011v1	Fundamental Research	A SARS-CoV-specific human monoclonal antibody, CR3022, could bind potently with 2019-nCoV RBD. -> Potential to be developed as candidate therapeutics ? Some of the most potent SARS-CoV-specific neutralizing antibodies that target the ACE2 binding site of SARS-CoV failed to bind 2019-nCoV spike protein. -> It is still necessary to develop novel monoclonal antibodies that could bind specifically to 2019-nCoV RBD.