

| Journal and date | Title | Authors and link | Field of expertise | Key facts |
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| The Lancet Psychiatry 07MAY2020 | COVID-19, unemployment, and suicide | <i>Kawohl</i> And Nordt., Switzerland https://www.thelancet.com/pdfs/journals/lanpsy/PIIS2215-0366(20)30141-3.pdf | 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. |
| Science 06MAY2020 | Rapid development of an inactivated vaccine candidate for SARS-CoV-2 | Gao et al., China https://science.sciencemag.org/content/early/2020/05/05/science.abc19327rss=1 | Vaccines | -> Pilot-scale production of a purified inactivated SARS-CoV-2 virus vaccine candidate (PiCoVacc), which induced SARS-CoV-2-specific neutralizing antibodies in mice, rats and non-human primates -> Antibodies neutralized 10 representative SARS-CoV-2 strains, suggesting a possible broader neutralizing ability against SARS-CoV-2 strains. -> Three immunizations using two different doses (3 µg or 6 µg per dose) provided partial or complete protection in macaques against SARS-CoV-2 challenge, respectively, without observable antibody-dependent enhancement of infection. These data support clinical development of SARS-CoV-2 vaccines for humans. |
| Autoimmunity reviews 5MAY2020 | 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 | 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. Comparison between subjects tested positive for SARS-CoV-2 and those found negative in terms of rate of administration of hydroxychloroquine/ colchicine therapy. - 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). |
| Cell 5MAY2020 | 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 | Isolation of single-domain antibodies (VHHs) from a llama immunized with prefusion-stabilized coronavirus spikes. 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. Cross-reactive VHH neutralizes SARS-CoV-2 S pseudotyped viruses as a bivalent human IgG Fc-fusion. => 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. |
| Nature 4MAY2020 | 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. |

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| Nature Communications 4MAY2020 | 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 4MAY2020 | 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 <u>At baseline:</u> >95% patients elevated had D-dimer and fibrinogen Median age = 63 years 64/150 thrombotic complications and 16,7% pulmonary embolisms <u>COVID19 (=77) vs non-COVID19 (=145):</u> - 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 | 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 | Accelerated yeast-based reverse genetics pipeline can genetically reconstruct diverse long RNA viruses, including Coronaviridae, Flaviviridae and Paramyxoviridae families : - 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. -> 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. - Also possible to rapidly introduce sequence variations to functionally characterize phenotypic consequences of SARS-CoV-2 evolution in real-time. |
| Cell host & microbe 4MAY2020 | 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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| Autoimmunity reviews 3MAY2020 | 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 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> |
| 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 | <p>71 laboratory-confirmed SARS-CoV-2 cases, identified 3 presymptomatic patients and 10 entirely asymptomatic infections:</p> <ul style="list-style-type: none"> - 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. <p>-> COVID-19 patients may already be infectious before symptoms manifestation, and 14 days isolation after diagnosis may be sufficient in entirely asymptomatic cases.</p> |
| Cell host & microbe PREPRINT | Identification of human single-domain antibodies against SARS-CoV-2 | Yanling Wu et al, China https://els-jbs-prod-cdn.jbs.elsevierhealth.com/pb-assets/products/coronavirus/chom2310_s50-1588612764040.pdf | 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. |

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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> <p>Cohort study of hospitalized patients with coronavirus disease 2019.</p> <p>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.</p> <p>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.</p> |
| JAMA Cardiology 1MAY2020 | 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 | <p>The spike protein of SARS-CoV-2 harbors a multiple arginine residues (multibasic) S1/S2 site.</p> <ul style="list-style-type: none"> - 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. <p>-> 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.</p> |
| 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 | <p>169 hospitals in Asia, Europe, North America 8910 patients → 5,8 % died Use of ACE inhibitors or ARBDs → no associated to death <u>Independently associated with increase of in hospital death:</u></p> <ul style="list-style-type: none"> - Age > 65 y [OR:1,93 (1,6 – 2,4)] - Coronary artery disease [OR:2,7 (2,08 – 3,51)] - Heart failure [OR:2,48 (1,62 – 3,79)] - Cardiac arrhythmia [OR:1,95 (1,33 – 2,86)] - Chronic obstructive pulmonary disease [OR:2,96 (2,0 – 4,4)] - Current smoking [OR:1,79 (1,29 – 2,47)] <p>→ underlying cardiovascular disease is associated with an increased risk of in hospital death</p> |
| 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/NEJMoa2007621 | Clinic | <p>169 hospitals in Asia, Europe, North America 8910 patients → 5,8 % died Use of ACE inhibitors or ARBDs → no associated to death <u>Independently associated with increase of in hospital death:</u></p> <ul style="list-style-type: none"> - Age > 65 y [OR:1,93 (1,6 – 2,4)] - Coronary artery disease [OR:2,7 (2,08 – 3,51)] - Heart failure [OR:2,48 (1,62 – 3,79)] - Cardiac arrhythmia [OR:1,95 (1,33 – 2,86)] - Chronic obstructive pulmonary disease [OR:2,96 (2,0 – 4,4)] - Current smoking [OR:1,79 (1,29 – 2,47)] <p>→ underlying cardiovascular disease is associated with an increased risk of in hospital death</p> |

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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: <ul style="list-style-type: none"> - 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 <ul style="list-style-type: none"> - 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 <p>Conclusion: Intensive care unit monitoring the kinetics of S-IgG should help to predict prognosis.</p> |
| 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. |
| 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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| 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> <p>-> 30 patients (75%) required invasive mechanical ventilation and 25 (63%) received vasoactive drugs.</p> <p>-> 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.</p> <p>⇒ Most patients (37 [93%]) showed an increase in QTc after the administration of antiviral therapy. 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, was recorded.</p> <p>⇒ 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).</p> <p>⇒ The antiviral treatment ceased before completion for 7 patients (17.5%) following ECG abnormalities and in 10 (25%) for acute renal failure.</p> |
| 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> |
| 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 | <p>Experience of mental health services and the lessons learned in Italy</p> <p>-> During epidemic: challenges have occurred in the management of health services</p> <p>->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</p> <p>-> Facilities for patients with psychiatric needs have been temporarily closed</p> <p>-> Patient confined in the facilities with very limited or no leave Considerable stresses</p> <p>Need for a leadership position in the psychosocial management of disasterlike situations.</p> |

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| 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 | <p>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.</p> <p>53 genomes generated from infected individuals (combination of metagenomic sequencing and tiling amplicon approaches) indicated:</p> <ul style="list-style-type: none"> - 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 | <p>Combinatorial Arrayed Reactions for Multiplexed Evaluation of Nucleic acids (CARMEN), a platform for scalable, multiplexed pathogen detection.</p> <p>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.</p> <p>CARMEN-Cas13 further enables comprehensive subtyping of influenza A strains and multiplexed identification of dozens of HIV drug-resistance mutations.</p> <p>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.</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, hypoxemia, 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 | <ul style="list-style-type: none"> -> 237 patients were enrolled and randomly assigned to a treatment group (158 to remdesivir and 79 to placebo) -> Remdesivir use was not associated with a difference in time to clinical improvement (hazard ratio 1.23 [95% CI 0.87–1.75]) -> 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]) -> 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>6 COVID-19 subjects with respiratory failure received convalescent plasma at a median of 21.5 days after first detection of viral shedding.</p> <p>All tested negative for SARS-CoV-2 RNA by 3 days after infusion, and 5 died eventually.</p> |
| 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 | <p>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.</p> |

| Journal and date | Title | Authors and link | Field of expertise | Key facts |
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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> |
| 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 | <p>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</p> <p><u>Patient with cancer had higher:</u></p> <ul style="list-style-type: none"> - 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 <p>Hematological, lung, metastatic cancer → higher rates of severe events</p> <p>→ patients with cancer tend to have more severe outcomes</p> |
| 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 | <p>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</p> <p><u>Risk factors for fatality:</u></p> <ul style="list-style-type: none"> - 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)] <p>More intensive surveillance for male and those with comorbidities</p> |

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| 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 | <p>Targeted metabolomic and lipidomic analyses of plasma from cohort of COVID-19 patients to identify plasma biomarkers associated with COVID-19:</p> <ul style="list-style-type: none"> - 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 | <p>Trends among US counties and COVID 19 growth rate in relation to existence of shelter in place (SIP) orders Machine learning</p> <p>Limiting gatherings to < 10 people reduced growth rate by 6,6%</p> <p>SIP → reduction of 7,8% versus counties with no SIP SIP orders and limitation gathering were additive</p> <p>Features predicting the effect of SIP:</p> <ul style="list-style-type: none"> - Population / Longitude / Population per square <p>→ SIP was effective → Counties with large population or high population density: benefit the most from a SIP</p> |
| 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 | <p>-> 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.</p> <p>-> 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.</p> |
| 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 | <p>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.</p> <p>-> Identification of important clinical and biochemical markers of multiple organs that correlated with the NCP lesion properties</p> <p>-> Together with the clinical data, this AI system was able to provide accurate clinical prognosis</p> |
| 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 | <p>Development of multidrug nanoparticles for the mitigation of uncontrolled inflammation.</p> <p>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.</p> <p>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.</p> <p>-> 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.</p> |

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| 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 (Nucleocapsid, 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 391 cases and 1286 close contact |
| 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 | 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: - Household contact (OR:6,27) - Contact travelling with a case (OR:7,06) 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 |
| 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 | > 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 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. 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 > Vaccine design and convalescent plasma antibody treatment might require specific considerations to accommodate the drift |

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| 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</p> <p><u>Laboratory:</u> 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]</p> <p>None of neonates had a positive result for SARS-CoV-2</p> <p>→ no vertical transmission – good outcomes for both group 42-woman COVID-19 who delivered during study period</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><u>Diagnosis COVID:</u> 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> |
| 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/Epidemio | <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</p> <p>All those develop symptoms will do within 14 days Median time recovery: 20,8 days Contact tracing reduced isolation period by 1,9 days</p> <p>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%)</p> <p>→ Isolation and contact tracing reduce the R and time during which cases are infectious</p> <p>→ children similar risk → analyses for transmission and control</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> |

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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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| 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. |
| 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> |

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| 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</p> <p>-> Type II pneumocytes, nasal secretory cells & absorptive enterocytes are <i>ACE2+TMPRSS2+</i></p> <p>-> Interferon & influenza increase <i>ACE2</i> in human nasal epithelia and lung tissue</p> <p>-> Mouse <i>Ace2</i> is not upregulated by interferon, raising implications for disease models</p> |
| 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/Politic | <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 | Bouraud et al., France https://doi.org/10.1017/S0008423920000335 | HSS/Politic | <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 |
| 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>106 patients COVID19+ and CT angiograms</p> <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 32%, 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% |
| 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>32 patients with COVID 19 and direct oral anticoagulants (DOACs) eligible for antiviral therapy (lopinavir, ritonavir or darunavir)</p> <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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| 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/S0009812020301789 | Diagnostics | 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. 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. |
| 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 | Tropism analysis from single cell RNA-seq datasets from multiple tissues from healthy human donors (Human Cell Atlas tissue consortium): - 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. 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 : - 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 -> All data provided as a user-friendly an open resource: www.covid19cellatlas.org |
| 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 | 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). -> 45.4% of US adults are potentially at increased risk of complications because of cardiovascular disease, diabetes, respiratory disease, hypertension, or cancer. - 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. |
| 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 | Simple and rapid immunodiagnostic method based on lateral flow immunoassay (LFIA) that uses lanthanide-doped polysterene nanoparticles (LNPs) to detect anti-SARV-CoV-2 IgG in human serum. The results of the validation experiment met the requirements for clinical diagnostic reagents 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. |
| 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 | The main protease (Mpro) of SARS-CoV-2 is a key enzyme that plays a pivotal role in mediating viral replication and transcription. Two lead compounds (11a and 11b) targeting Mpro were designed and synthesized. 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. Both compounds showed good PK properties in vivo , and 11a also exhibited low toxicity, suggesting that these compounds are promising drug candidates. |

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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> <p>- Limit : Only 2 patients, sensitivity (RNA is much less stable in amniotic fluid than is DNA), lack of cord blood.</p> <p>Multicenter study – cases (79) controls (40) study <i>Controls: historical group of season influenza patients</i> Basal characteristics: no difference between group <i>Cases: 31(39%) with new onset smell or taste disorders (STD): for 35.5% initial symptoms</i> Now-set of STD more frequent in cases than controls: - Adjusted OR: 21,4 [2.77 – 165.4] No difference for gender/smoking habits/severity between STD or not in case group. Increased frequency of STD in young patients STD more frequent among COVID-19 patients <u>Limitations</u>: historical controls – lack of comparison with others virus – self reported questionnaire 100 patients COVID19+ and severely ill Mean age: 66 years and 70% males 23% had acute pulmonary embolus: - More frequent in critical care unit (p<0,01) - Longer delay from symptoms onset to CT (12 d) Requirement of mechanical ventilation was associated with pulmonary embolus (OR=3,8, p=0,049) Extent of lesions was not associated with pulmonary embolus. Contrast enhanced CT rather for these patients</p> |
| 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.14273 | Clinic | <p>Increased frequency of STD in young patients STD more frequent among COVID-19 patients <u>Limitations</u>: historical controls – lack of comparison with others virus – self reported questionnaire 100 patients COVID19+ and severely ill Mean age: 66 years and 70% males 23% had acute pulmonary embolus: - More frequent in critical care unit (p<0,01) - Longer delay from symptoms onset to CT (12 d) Requirement of mechanical ventilation was associated with pulmonary embolus (OR=3,8, p=0,049) Extent of lesions was not associated with pulmonary embolus. 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>Increased frequency of STD in young patients STD more frequent among COVID-19 patients <u>Limitations</u>: historical controls – lack of comparison with others virus – self reported questionnaire 100 patients COVID19+ and severely ill Mean age: 66 years and 70% males 23% had acute pulmonary embolus: - More frequent in critical care unit (p<0,01) - Longer delay from symptoms onset to CT (12 d) Requirement of mechanical ventilation was associated with pulmonary embolus (OR=3,8, p=0,049) Extent of lesions was not associated with pulmonary embolus. 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.scitotenv.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 | <u>Retrospective study – hospitalized patients only</u> 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 |
| 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:</p> <p>IgM: Sensitivity, 77.3% Specificity, 100% PPV, 100% NPV, 80.0% Consistency rate : 88.1%</p> <p>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</p> <p>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</p> <p>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 <u>High group significantly:</u></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 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) -> 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: - 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> <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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| NEJM 14APR2020 | Spread of SARS-CoV-2 in the Icelandic Population | Gudbjartsson and al, Iceland https://www.nejm.org/doi/full/10.1056/NEJMoa2006100?query=feature_d_home | HSS/Politic | <p><u>Two strategies:</u></p> <p>1 Testing of persons at high risk (9199 persons) 1221 positive = 13,3% 38 of the 564 children under 10 years tested positive</p> <p>2 Population screening Open invitation for testing (130797): 87 positives (0,8%) Randomly chosen Icelanders (2283): 13 positives (0,6%) Through population screening: 100 of 13080 (0,8%) None of them were children under 10 years</p> <p>Young children and female were less likely to test positive The haplotypes of the virus that were propagating in the general population came from a different source The frequency of COVID-19 was stable in Iceland</p> |
| Clinical pharmacology and therapeutics, 14APR2020 | Optimizing hydroxychloroquine dosing for patients with COVID-19: An integrative modeling approach for effective drug repurposing | Garcia-Cremades, Maria et al, USA https://doi.org/10.1002/cpt.1856 | Therapeutics | <p>The data sources :</p> <ol style="list-style-type: none"> 1) longitudinal clinical, pharmacokinetic, and virologic data from severe COVID 19 patients who received HCQ with or without azithromycin (n=116), 2) in vitro viral replication data and SARS-CoV-2 viral load inhibition by HCQ, 3) a population pharmacokinetic model of HCQ 4) a model relating chloroquine pharmacokinetics to QTc prolongation <p>Results : HCQ doses > 400 mg BID for ≥5 days were predicted to rapidly decrease viral loads, reduce the proportion of patients with detectable SARS-CoV-2 infection, and shorten treatment courses HCQ doses >600 mg BID were predicted to prolong QTc intervals</p> |
| Cell Systems 14APR2020 | Complex immune dysregulation in COVID-19 patients with severe respiratory failure | Evangelos J., Greece https://www.cell.com/pb-assets/products/coronavirus/CHOM2296_s50.pdf | Immunology | <p>COVID-19 patients undergo an acute immune dysregulation with deterioration into severe respiratory failure (SRF) before the overall state of severity</p> <ul style="list-style-type: none"> - Major decrease of HLA-DR on CD14-monocytes is associated with SRF. However, patients with pneumonia by SRS-CoV-2 at an intermediate immune state maintained their number of molecules of HLA-DR on CD14-monocytes much closer to the healthy condition - Patients with immune dysregulation by COVID-19 had lower counts of CD3+ /CD4+ /CD45+ -lymphocytes, CD3+ /CD8+ /CD45+ -lymphocytes and CD3- /CD16+ /CD56+ /CD45+ -cells that those at an intermediate immune state ; In addition, the Th17 function was down-regulated among patients with immune dysregulation - Patients at immune dysregulation had lower IgM than those at an intermediate immune state - Phenotyping and cytokine analyses reveal that in the case of SRF aggravated pneumonia by SARS-CoV-2, there is a unique combination of defective antigen presentation and lymphopenia that leads to defective function of lymphoid cells, whereas monocytes remain potent for the production of TNFα and IL-6. - Analyses point out that the immune dysregulation is driven by IL-6 and not by IL-1β; and MAS which is driven by IL-1β <p>In conclusion: The signature of immune dysregulation in the patients with SARS-CoV-2, is characterized on by normal or high cytokine production capacity and increased circulating cytokines (especially IL-6), and by defects of the number of molecules of HLA-DR on their CD14-monocyte</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/allr.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/Political | 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/jama-pediatrics.2020.1346 | 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 | French authorities appointed an advisory board of 11 scientists to help manage the crisis =>evidence-based policy but: 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 | -> Development of highly specific RT-LAMP assays for detection of SARS-CoV-2. -> 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. |
| 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 | 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. 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 |
| 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 | In human airway epithelial cell cultures : - 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. In mice: - Prophylactic and therapeutic administration improved pulmonary function, reduced virus titer and weight loss (mice infected with SARS-CoV or MERS-CoV) -> potency of NHC/EIDD-2801 against multiple coronaviruses and oral bioavailability makes it a potential effective antiviral against SARS-CoV-2 |
| 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 | 15 COVID-19 patients under Tocilizumab (TCZ) therapy were retrospectively assessed. - 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. => 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. 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. |

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| 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 | <p>-> Identification of 7 clusters of COVID-19 in Singapore in which presymptomatic transmission likely occurred and which may explain the occurrence of secondary cases</p> |

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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> |
| Virology 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 they 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 were 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 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: - Male (OR: 2,3 [1,0-4,8]) and anorexia admission (OR:3,9 [1,1-13,4])</p> <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.iist.fr/journals/jama/fullarticle/2763983 | Therapeutic | <p>5 patients: severe pneumonia + $P_{A_{O_2}}/F_{I_{O_2}} < 300$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 $P_{A_{O_2}}/F_{I_{O_2}}$, 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: - 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.</p> <p>- 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> <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 (Bengladesh):</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</p> <p><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 ».</p> <p>-> 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 S viral genes cloned into pcDAN3.1 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 |
| 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 | <ul style="list-style-type: none"> • 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 |

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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 that 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, China 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 Primary endpoint : virological clearance at day-6 post-inclusion <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., 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/S24687189203011007via%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/lancet/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/lanin/article/PIIS1473-3099(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/tab-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 28FEB2020 | 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 annal 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/Politic | -> 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/Epidemio | -> 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/lanlco/article/PIIS2214-109X(20)30068-1/fulltext | Public Health/Epidemio | 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/Epidemio | 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 | <ul style="list-style-type: none"> 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. Which are the probably most common sites undergoing to an aminoacidic change ? -> Insight of some important proteins of the COVID-2019 that are involved in the mechanism of viral entry and viral replication 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 |

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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/PIIS1473-3099(20)30411-6/fulltext | Public Health/Epidemio | - 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/PIIS1473-3099(20)30114-6/fulltext | Public Health/Epidemio | - 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, Ching 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 . |

| Journal and date | Title | Authors and link | Field of expertise | Key facts |
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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. |