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- 199 patients included: 99 received lopinavir-ritonavir and 100 standard care alone:  
  - 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]  
Others outcomes:  
- 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  
Overall mortality at 22.1% |
On the 1391 children tested at Wuhan Children's Hospital, 171 (12.3%) were positive for SARS-CoV2 infection.  
Median age: 6.7 years  
- Male: 60.8 %  
Fever: 41.5 %  
Cough: 48.5 %  
Pneumonia: 64.9 %  
3 patients (with coexisting conditions) require intensive care and 1 death  
Most children appear to be mild symptomatic. |
| 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](https://www.thelancet.com/journals/langas/article/PIIS2468-1253(20)30080-7/fulltext) | How to prevent nosocomial infection to patients with decompensated cirrhosis? | Previously known: Patients with decompensated cirrhosis have a higher risk of, and mortality from, infection.  
- > 111 patients with decompensated cirrhosis (were included)  
- > New precautionary procedures were implemented (see paper)  
- > Incidence of COVID19 was lower than in other groups.  
The simple approach (see paper) could be an effective means of preventing COVID-19 in patients with decompensated cirrhosis. |
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 |
- > Clinical characteristics (symptoms, laboratory examinations, and chest CT) were similar to those of non-transplanted COVID-19 patients  
- > Following a treatment regimen: reduced immunosuppressant use and low dose methylprednisolone-based therapy  
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. |
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  -> Patients with platelet peaks during treatment: longer hospitalization.  
  -> Patients with platelet peaks were older  
  -> Higher PLT (platelet to lymphocyte ratio): longer hospitalisation.  
  It may be related to cytokine storm. |
  - 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.  
  Aerosol and fomite transmission of SARS-CoV-2 is plausible |
  - 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  
  There is no evidence that SARS-CoV-2 undergoes intrauterine or transplacental transmission from infected pregnant women to their fetuses. |
| 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/lancet/article/PIIS2468-2667(20)30058-X/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS2468-2667(20)30058-X/fulltext) | PRISONS | Prisons are epicentres for infectious diseases:  
  - 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  
  - 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. |
  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:  
  - ASCs appeared in the blood at the time of viral clearance (day 7; 1.48%) and peaked on day 8 (6.91%).  
  - Emergence of cTFH cells in blood at day 7 (1.98%), increasing on day 8 (3.25%) and day 9 (4.46%).  
  - 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.  
  - 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).  
  - Interestingly, minimal pro-inflammatory cytokines and chemokines were found in this patient with COVID-19, even at days 7–9. |
### Journal and date

<table>
<thead>
<tr>
<th>Science 16MAR2020</th>
<th>Substantial undocumented infection facilitates the rapid dissemination of novel coronavirus (SARS-CoV2).</th>
<th>Li et al., UK</th>
<th>Impact of undocumented infection?</th>
<th>From observations of reported infection within China + mobility data + a networked dynamic metapopulation model and Bayesian inference -&gt; 86% of all infections were undocumented (95% CI: [82%–90%]) prior to 23 January 2020 travel restrictions. -&gt; Undocumented infections were the infection source for 79% of documented cases. It explains the rapid geographic spread of SARS-CoV2 and indicate containment of this virus will be particularly challenging.</th>
</tr>
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<tr>
<td>The Lancet 16MAR2020</td>
<td>Preparedness is essential for malaria-endemic regions during the COVID-19 pandemic</td>
<td>Wang et al., China</td>
<td>In malaria endemic regions?</td>
<td>-&gt; Relevant lessons from the 2014–16 outbreak of Ebola virus disease in west Africa. -&gt; 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.</td>
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<td>The Lancet 16MAR2020</td>
<td>Screening of faecal microbiota transplant donors during the COVID-19 outbreak: suggestions for urgent updates from an international expert panel</td>
<td>Ianiro et al., Italy</td>
<td>What about stool banks and faecal microbiota transplant?</td>
<td>-&gt; Before each donation, physicians should screen for two main items: the presence of typical COVID-19 symptoms. -&gt; In endemic countries, the RT-PCR assay should be considered in all donors. -&gt; 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.</td>
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<tr>
<td>JAMA 13MAR2020</td>
<td>Risk Factors Associated With Acute Respiratory Distress Syndrome and Death in Patients With Coronavirus Disease 2019 Pneumonia in Wuhan, China</td>
<td>Wu et al., China</td>
<td>What are the risk factors associated to ARDS and death?</td>
<td>-&gt; 201 patients included in the study. Risk factors to develop ARDS: • Older age, neutrophilia, and organ and coagulation dysfunction (e.g., 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.</td>
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<td>Euro Surv 12MAR2020</td>
<td>Retrospective analysis of the possibility of predicting the COVID-19 outbreak from internet searches and social media data, China, 2020</td>
<td>Li et al., China</td>
<td>How do predict development of outbreak early?</td>
<td>To predict the development of this outbreak as early and as reliably as possible. -&gt; 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 &gt; 0.89. -&gt; 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. -&gt; The lag correlation showed a maximum correlation at 8–12 days for laboratory-confirmed cases and 6–8 days for suspected cases.</td>
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| 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 [link](https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(20)30174-2/fulltext) | Why using sputum and not throat swab in convalescent patients? | -> 2 cases in convalescence  
-> Both negative with throat swab and anal swabs  
-> Positive in induced sputum  
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. |
| The Lancet 12MAR2020 | Real estimates of mortality following COVID-19 infection | Baud et al., Switzerland [link](https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(20)30195-X) | What are the real numbers of mortality? | 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 [link](https://www.thelancet.com/journals/lanres/article/PIIIS2213-2600(20)30116-8/fulltext) | Comorbidities and increased risk of infection | 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. |
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 | 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 [link](https://jamanetwork.com/journals/jama/fullarticle/2762997) | Which specimens present with the highest positive rate? And the lower? | -> 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%)  
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| 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 [153508-020-65123:1](#) | Against RNA replication | To know: RNA Helicase nsP13 is essential for the viral RNA replication of the SARS coronavirus Here: ...
... |
| 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_artic](#) | Need for RT-PCR in asymptomatic patients? | ...
... |
| 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/ciaa237/580198](#) | Use of Chloroquine and Hydroxychloroquine? | ...
... |
| 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.aba9757.long](#) | Effect of travel quarantine of Wuhan at national and international scale? | ...
... |
| 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/pii%2FS0092867420302294%3Fshowtitle%true](#) | Key insights into the first step of 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 | What do we learn from the structural basis of ACE2? | - Cryo-EM structures of human ACE2, in the presence of a neutral amino acid transporter B0AT1, 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 B0AT1  
- 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. |
- Results available in approximately 69 minutes  
- 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. |
- 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  
- 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/2762092?resultClick=1 | What about nosocomial transmission? | 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 |
- Population genetic analyses of 103 genomes of SARS-CoV-2 incate 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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<tr>
<td>JAMA 03MAR2020</td>
<td>Epidemiologic Features and Clinical Course of Patients Infected With SARS-CoV-2 in Singapore</td>
<td>Young et al., Singapore <a href="https://jamanetwork.com/journals/jama/fullarticle/2762688">https://jamanetwork.com/journals/jama/fullarticle/2762688</a></td>
<td>Singapore’s experience with the SARS-CoV-2 epidemic?</td>
<td>-&gt; 18 patients diagnosed with SARS-CoV-2 infection in Singapore between January 23 and February 3, 2020</td>
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<td>-&gt; Respiratory tract infection with prolonged viral shedding from the nasopharynx of 7 days or longer in 15 patients (83%)</td>
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<td>-&gt; Supplemental oxygen was required in 6 patients (33%), 5 of whom were treated with lopinavir-ritonavir, with variable clinical outcomes following treatment.</td>
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<td>- Oropharyngeal swab test was positive by RT-PCR.</td>
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<td>-&gt; Received symptomatic treatment and antimicrobial therapy including oseltamivir, arbidol, Lopinavir/ritonavir and moxifloxacin</td>
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<td>-&gt; 6 testing from 28 Jan to 17FEB, all negative but one the 2FEB Discharged on 9FEB and testing remained negative during follow-up.</td>
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<td>Jour of Infect 29FEB2020</td>
<td>Identification of the hyper-variable genomic hotspot for the novel coronavirus SARS-CoV-2</td>
<td>Wen et al., China [<a href="https://www.journalinfec">https://www.journalinfec</a> tion.com/article/S0163-4452(20)30108-0/pdf](<a href="https://www.journalinfec">https://www.journalinfec</a> tion.com/article/S0163-4452(20)30108-0/pdf)</td>
<td>SARS-CoV-2 : which mutations in current population and from SARS-CoV ? What does that mean ?</td>
<td>-&gt; Confirmation of the relationship of SARS-CoV-2 with other beta coronaviruses on the amino acid level.</td>
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<td>-&gt; Hyper-variable genomic hotspot established in SARS-CoV-2 population at the nucleotide but not the amino acid level -&gt; means no beneficial mutations.</td>
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<td>-&gt; Mutations in nsp1, nsp3, nsp15, and gene S would be associated with the SARS-CoV-2 epidemic (compared with RaTG13) / required for human adaptation?</td>
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<td>2-&gt; Immunoinformatic analysis of 13 MHC I and 3 MHC II epitopes which have antigenic properties</td>
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<td>3-&gt; These identified epitopes are candidate to formulate a multi-epitopic peptide vaccine. Need for in vitro and in vivo validations</td>
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<td>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.</td>
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<td>Most common symptoms: fever (43.8% on admission and 88.7% during hospitalization) and cough (67.8%). Diarrhea was uncommon (3.8%). Median incubation period: 4 days (interquartile range, 2 to 7).</td>
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<td>CT: ground-glass opacity was the most common radiologic: 56.4%. No radiographic or CT abnormality: 17.9% with nonsevere disease and 2.9% with severe disease.</td>
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<td>Lymphocytopenia: 83.2%</td>
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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 [1](https://www.eurosurveillance.org/content/10.2807/1560-7917.ES.2020.25.8.200097) | How important is non-virological descriptive characteristics ? | - 2 woman arriving in Thailand at different times (8 and 13 January)  
- The two viral genomes are identical to four sequences from Wuhan, while no direct link to the Huanan Seafood Market.  
- Identical genomes of up to 30 kb are rare and a strong sign of recent transmission linkage  
- Data suggest that transmission within Wuhan beyond the Huanan Seafood Market is likely to have occurred in the first week of January or earlier. |
| 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 [2](https://www.mdpi.com/2077-0383/9/3/637) | How important is non-virological descriptive characteristics ? | - Non-virological descriptive characteristics could have determined that the outbreak is caused by a novel pathogen in advance of virological testing.  
- Characteristics of the outbreak were collected in real time and compared with characteristics of eleven pathogens that have previously caused cases of atypical pneumonia.  
- The probability that a new virus was driving the outbreak was assessed as over 29% on 31 December 2019, one week before virus identification. |
| The Lancet 27FEB2020 | Secondary attack rate and superspreading events for SARS-CoV-2 | Liu et al., UK [3](https://www.thelancet.com/journals/lancet/article/PID140-6736(20)30462-1/fulltext) | Do specific situations or settings drive the outbreak ? | - COVID-19 characterised by an overexuberant inflammatory response  
- SARS-CoV-2 viral load is not correlated with the worsening of symptoms  
- Inhibition of numb- associated kinase (NAK) family would reduce viral infection in vitro (inhibit clathrin-mediated endocytosis and thereby inhibit viral infection of cells)  
- 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  
- Baricitinib is a NAK inhibitor (anti-viral)  
- Baricitinib, fedratinib, and ruxolitinib are JAK inhibitors (anti-inflammatory)  
- Baricitinib is the best of the group  
- More data are needed. |
| The Lancet 27FEB2020 | COVID-19: combining antiviral and anti-inflammatory treatments | Stebbing et al., UK [4](https://www.thelancet.com/journals/lancet/article/PID1473-3099(20)30132-8/fulltext) | Use of Baricitinib? | - 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. |
| The Lancet 27FEB2020 | Positive RT-PCR Test Results in Patients Recovered From COVID-19 | Lan et al, China [5](https://jamanetwork.com/journals/jama/fullarticle/2762642) | Virus re-detection in recovered patients ? | Little attention has been paid to the follow-up of recovered patients so far. |
### Literature review of accepted relevant papers

**19-03-2020**

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| **The Lancet, 27FEB2020** | Convalescent plasma as a potential therapy for COVID-19 | Chen et al., China [link](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)30640-8/fulltext) | Convalescent plasma as a therapy? | - 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 [link](https://www.tandfonline.com/doi/full/10.1080/22221937.2020.1732837) | What does viral RNA in blood mean for clinical severity? | - 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 [link](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)30460-8/fulltext) | Psychological impact of quarantine? Recommendation? | - Information is key: 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 |
- 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 |
- 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 [link](https://www.thelancet.com/journals/langlo/article/PIIS0170-2105(20)30068-2/fulltext) | Does health care resource availability impact on mortality? | 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 [link](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)30421-9/fulltext) | How and why controlling mass population movements? | 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. |
### Literature review of accepted relevant papers

**19-03-2020**

<table>
<thead>
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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/2077-0885/9/1/601                      | How much reducing travel impacted on virus exportation?                        | - 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://journals.amia.org/content/early/2020/02/26/JP.  
03155-20.long | ACE2: any variants?  
any variation in expression? What would that mean in terms of susceptibility or response to disease/virus? | - 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/lancet/article/PI  
IS1473-3099(20)30134-1/fulltext | What are the clinical course and outcomes on 52 critically ill adult patients? | - 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/lancet/article/PI  
IS1473-3099(20)30135-2/fulltext | What is the dynamics of the viral load in sputum, urine, throat swab and stool in 82 infected individuals? | - 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/lancet/article/PI  
IS1473-3099(20)30134-1/fulltext | What has CT taught us? | - 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. |
25719 | How SARS-Cov-2 is different from the other viruses?  
Which are the potential effects of these differences? | The Open Reading Frame 1ab (ORF1ab) of COVID-19 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  
  nsp3 -> could suggest a potential mechanism differentiating COVID-2019 from SARS|
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<td>Radiology 20 FEB 2020</td>
<td>Chest CT Findings in Coronavirus Disease-19 (COVID-19): Relationship to Duration of Infection.</td>
<td>Bernheim et al., <a href="https://pubs.rsna.org/doi/10.1148/radiol.2020200463">https://pubs.rsna.org/doi/10.1148/radiol.2020200463</a></td>
<td>CT findings in relation with time between symptom onset to initial CT scan</td>
<td>Frequency of CT findings is related to infection time course.</td>
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<td>The Lancet 19FEB2020</td>
<td>Asymptomatic cases in a family cluster with SARS-CoV-2 infection</td>
<td>Pan et al., China [<a href="https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(20)30114-6/">https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(20)30114-6/</a> fulltext](<a href="https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(20)30114-6/">https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(20)30114-6/</a> fulltext)</td>
<td>Asymptomatic transmission?</td>
<td>- 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.</td>
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<td>The Lancet 19FEB2020</td>
<td>Enteric involvement of coronaviruses: is faecal–oral transmission of SARS-CoV-2 possible?</td>
<td>Yeo et al., Singapore [<a href="https://www.thelancet.com/journals/langas/article/PIIS2468-1253(20)30048-0/">https://www.thelancet.com/journals/langas/article/PIIS2468-1253(20)30048-0/</a> fulltext](<a href="https://www.thelancet.com/journals/langas/article/PIIS2468-1253(20)30048-0/">https://www.thelancet.com/journals/langas/article/PIIS2468-1253(20)30048-0/</a> fulltext)</td>
<td>Is faecal–oral transmission of SARS-CoV-2 possible?</td>
<td>- 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.</td>
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<td>- Higher viral loads detected in the nose than in the throat.</td>
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<td>- 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.</td>
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<td>- 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.</td>
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<td>J Infect Dis. 18FEB2020</td>
<td>A familial cluster of infection associated with the 2019 novel coronavirus indicating potential person-to-person transmission during the incubation period.</td>
<td>Yu et al., China <a href="https://academic.oup.com/jid/advance-article/doi/10.1093/infdis/jiaa077/573975">https://academic.oup.com/jid/advance-article/doi/10.1093/infdis/jiaa077/573975</a></td>
<td>Asymptomatic transmission ?</td>
<td>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.</td>
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| The Lancet 18FEB2020 | Tracking online heroisation and blame in epidemics | Atiani Duault et al., France https://www.thelancet.com/action/showPdf?pii=S1406-6004%2820%2930053-5 | Why should we pay attention to local perception ? | -> 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 Biophy 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/S0006291X20303399 | The receptor ACE-2: Where is it found (which organisms, which part of the organisms?) What does it mean? | 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 throughout the animal kingdom (possible hosts ?) 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/2072-6672/10/3/538 | Incubation period? | 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/2020/02/12/20013117 | Efficacy of prophylactic and therapeutic remdesivir treatment in a NHP model of MERS-CoV infection ? | - 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 |
<p>| The Lancet 12 FEB 2020 | What are the risks of COVID-19 infection in pregnant women? | Qiao et al., China <a href="https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)30385-2/fulltext">https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)30385-2/fulltext</a> | 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 <a href="https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)30386-3/fulltext">https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)30386-3/fulltext</a> | Is there a vertical transmission of the virus ? | 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 <a href="https://www.nature.com/articles/s41422-020-0382-0">https://www.nature.com/articles/s41422-020-0382-0</a> | 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. |</p>
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| Euro Surveill 6FEB2020 | Effectiveness of airport screening at detecting travellers infected with novel coronavirus (2019-nCoV). | Quilty et al., UK [link](https://www.eurosurveillance.org/content/10.2807/1560-7917.ES.2020.25.5.200080) | Are airport screening effective? | 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 [link](https://www.thelancet.com/pdfs/journals/lancet/PII/S0140-6736(20)30304-4.pdf) | | 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. |
->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. |