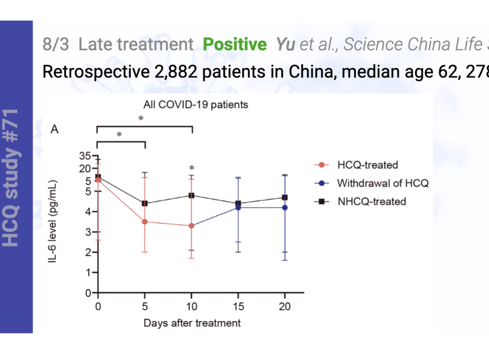
UNDER ATTACK

HCQ study #71

8/3 Late treatment **Positive** *Yu et al., Science China Life Sciences, 2...*
Retrospective 2,882 patients in China, median age 62, 278...



PrEP	PEP	Early	Late	All
100%	100%	100%	62%	74%

72 studies (42 peer reviewed)
COVID deaths: **769,132**

Global HCQ studies. PrEP, PEP, and early treatment studies show high effectiveness, while late treatment shows mixed results.

Date	Result	Stage	Source	Title	Summary
8/11	Negative	Late	*Saleemi et al., medRxiv, doi:10.1101/2020....*	Time to negative PCR from symptom onset in COVID-19 patients on Hydroxychloroquine ...	Retrospective 65 HCQ+AZ, 20 control patients, showing median time to negative PCR of 23 days for HCQ+AZ vs. 19 days for control. Confoundin...
8/4	Positive (news)	Late	*Iacoviello et al., upcoming study (News) (n...*	INTERVIEW EXCLUSIVE : Efficacité de l'hydroxychloroquine confirmée sur 3451 patients i...	Upcoming study of 3,451 hospitalized patients in Italy reports that HCQ results in a 30% reduction in mortality. Treatment started on the first day ...
8/3	Positive	Late	*Yu et al., Science China Life Sciences, 2020...*	Beneficial effects exerted by hydroxychloroquine in treating COVID-19 patients via protec...	Retrospective 2,882 patients in China, median age 62, 278 receiving HCQ, median 10 days post hospitalization, showing that HCQ treatment can r...
8/4	Inconc.	Late	*Kamran et al., medRxiv, doi:10.1101/2020....*	Clearing the fog: Is HCQ effective in reducing COVID-19 progression: A randomized contr...	Study of 349 low-risk hospitalized patients with 151 non-consenting or ineligible patients used as controls. SOC included zinc, vitamin C and vita...
8/2	Positive	Late	*Davido et al., Int. J. Antimicrobial Agents, 2...*	Impact of medical care including anti-infective agents use on the prognosis of COVID-19 ...	Retrospective of 132 hospitalized patients. HCQ+AZ significantly reduces death/ICU, HR=0.45, p=0.04. Adjusted for Charlson Comorbidity Index (i...
8/2	In Vitro	In Vit...	*Sheaff, R., bioRxiv, doi:10.1101/2020.08.02...*	A New Model of SARS-CoV-2 Infection Based on (Hydroxy)Chloroquine Activity	*In vitro* study presenting a new theory on SARS-CoV-2 infection and why HCQ/CQ provides benefits, which potentially explains the observed relati...
7/29	Positive	Late	*D'Arminio Monforte et al., Int. J. Infectious ...*	Effectiveness of Hydroxychloroquine in COVID-19 disease: A done and dusted situation?	HCQ+AZ adjusted death HR 0.44, p=0.009. Propensity scores include baseline COVID-19 disease severity, age, gender, number of comorbidities, c...
7/26	Inconc.	PEP	*Mitjà et al., medRxiv, doi:10.1101/2020.07....*	A Cluster-Randomized Trial of Hydroxychloroquine as Prevention of Covid-19 Transmissi...	Death rate reduced from 0.6% to 0.4%, RR 0.68, not statistically significant due to low incidence (8 control cases, 5 treatment cases). For positive ...
7/24	Positive	PrEP	*Khurana et al., medRxiv, doi:10.1101/2020....*	Prevalence and clinical correlates of COVID-19 outbreak among healthcare workers in a t...	Study of hospital health care workers showing HCQ prophylaxis reduces COVID-19 significantly, OR 0.30, p=0.02. 94 positive health care workers ...
7/23	Negative	Late	*Cavalcanti et al., NEJM, July 23, 2020, doi:...*	Hydroxychloroquine with or without Azithromycin in Mild-to-Moderate Covid-19	Late stage RCT of 667 hospitalized patients with up to 14 days of symptoms at enrollment and receiving up to 4 liters per minute supplemental o...
7/22	In Vitro	In Vit...	*Hoffmann et al., Nature, (2020), doi:10.103...*	Chloroquine does not inhibit infection of human lung cells with SARS-CoV-2	The title of this paper does not appear to match the results. Fig. 1b @100uM shows CQ results in a ~4.5 fold decrease (on a linear scale) in extrac...
7/21	Positive	Late	*Bernaola et al., medRxiv, doi:10.1101/2020...*	Observational Study of the Efficiency of Treatments in Patients Hospitalized with Covid-1...	HCQ HR 0.83 [0.77-0.89] based on propensity score matched retrospective analysis of 1,645 hospitalized patients. Prednisone HR 0.85 [0.82-0.88]...
7/20	Meta (positive)	Early	*Risch, H., American Journal of Epidemiolo...*	Response to: "Early Outpatient Treatment of Symptomatic, High-Risk Covid-19 Patients" ...	Updated meta analysis including 7 new studies of high-risk outpatients, for a total of 12 studies, all showing significant benefit.
7/18	Meta (positive)	PEP	*Watanabe, M., arXiv.org, arXiv:2007.09477 ...*	Efficacy of Hydroxychloroquine as Prophylaxis for Covid-19	Secondary analysis of Boulware et al.'s PEP trial and treatment delay-response data, confirming that HCQ is effective when used early, p<0.01. Th...
7/16	Positive	Early	*Hong et al., Infect. Chemother., 2020, 52:e4...*	Early Hydroxychloroquine Administration for Rapid Severe Acute Respiratory Syndrome C...	HCQ 1-4 days from diagnosis was the only protective factor against prolonged viral shedding found, OR 0.111, p=0.001. 57.1% viral clearance with...
7/16	Inconc.	Early	*Skipper et al., Annals of Internal Medicine, ...*	Hydroxychloroquine in Nonhospitalized Adults With Early COVID-19: A Randomized Trial	~70 to 140 hour (inc. shipping) delayed outpatient treatment with HCQ reduced combined hospitalization/death by 50%, p=0.29 (5 HCQ cases, 10...
7/16	Inconc.	Early	*Mitjà et al., Clinical Infectious Diseases, cia...*	Hydroxychloroquine for Early Treatment of Adults with Mild Covid-19: A Randomized-Con...	This paper has inconsistent data - some of the values reported in Table 2 and the abstract correspond to 12 control hospitalizations, while others ...
7/9	Meta (positive)	Early,...	*Raoult et al., Preprint (Preprint) (meta analy...*	Hydroxychloroquine and Azithromycin as a Treatment of COVID-19: Results of an Open-L...	Updated meta analysis showing significant reductions in mortality and viral shedding. Mortality OR 0.53 [0.4-0.71] for clinical studies, 0.92 big dat...
7/7	Negative	Late	*An et al., medRxiv, doi:10.1101/2020.07.04....*	Treatment Response to Hydroxychloroquine and Antibiotics for mild to moderate COVID-...	Retrospective of hospitalized patients with 31 HCQ patients and 195 standard treatment patients, not showing a significant difference in terms of ...
7/3	Positive	PrEP	*Zhong et al., Lancent Rheumatology, 10.10...*	COVID-19 in patients with rheumatic disease in Hubei province, China: a multicentre retro...	Rheumatic disease patients on HCQ had a lower risk of COVID-19 than those on other disease-modifying anti-rheumatic drugs, OR 0.09 (0.01–0.9...
7/3	Positive	Early	*Scholz et al., Preprints 2020, 2020070025, ...*	COVID-19 Outpatients – Early Risk-Stratified Treatment with Zinc Plus Low Dose Hydroxy...	Early treatment with HCQ+AZ+Z results in 84% lower hospitalization and 80% lower death - hospitalization OR 0.16 (p<0.001), death OR 0.2 (p=0.1...
7/1	Positive	Late	*Arshad et al., Int. J. Infect. Dis., July 1 2020...*	Treatment with Hydroxychloroquine, Azithromycin, and Combination in Patients Hospitali...	HCQ decreases mortality from 26.4% to 13.5% (HCQ) or 20.1% (HCQ+AZ). Propensity matched HCQ HR 0.487, p=0.009. Michigan 2,541 patients r...
7/1	Safety	N/A	*Samuel et al., Heart Rhythm, doi:10.1016/j....*	Incidence of arrhythmias and electrocardiographic abnormalities in symptomatic pediatri...	In pediatric patients with PCR positive active COVID-19 infection, significant arrhythmias are infrequent, but occur at an incidence higher than exp...
6/30	Positive	Late	*Mikami et al., J. Gen. Intern. Med., doi:10.1...*	Risk Factors for Mortality in Patients with COVID-19 in New York City	HCQ decreases mortality, HR 0.53 (CI 0.41–0.67). IPTW adjustment does not significantly change HR 0.53 (0.41-0.68). Retrospective 6,000 patien...
6/29	Positive	PrEP	*Ferreira et al., J. Medical Virology, July 9, 2...*	Chronic treatment with hydroxychloroquine and SARS-CoV-2 infection	Chronic treatment with HCQ provides protection against COVID, odds ratio 0.51 (0.37-0.70). Confounding factors include that people with autoim...
6/29	Safety	N/A	*Mfeukeu-Kuate et al. (Preprint) (not include...*	Electrocardiographic safety of daily Hydroxychloroquine 400mg plus Azithromycin 250m...	No life-threatening modifications of the QT interval was observed in non-severe COVID-19 patients treated ambulatory with HCQ+AZ. 51 relatively ...
6/25	Positive	Early	*Lagier et al., Travel Med. Infect. Dis. 10179...*	Outcomes of 3,737 COVID-19 patients treated with hydroxychloroquine/azithromycin and...	Early treatment leads to significantly better clinical outcome and faster viral load reduction. Matched sample mortality HR 0.41 p-value 0.048. Retr...
6/22	In Vitro	In Vit...	*Wang et al., bioRxiv, doi:10.1101/2020.06.2...*	Chloroquine and hydroxychloroquine as ACE2 blockers to inhibit viropexis of COVID-19 S...	In vitro study, not included in the study count or percentages. CQ and HCQ inhibit the entry of COVID-19 spike pseudotype virus using ACE2 high e...
6/22	Positive	Early	*Chen et al., medRxiv, doi:10.1101/2020.06....*	Efficacy and safety of chloroquine or hydroxychloroquine in moderate type of COVID-19: ...	Significantly faster clinical recovery and shorter time to RNA negative (from 7.0 days to 2.0 days (HCQ), p=0.01. 67 patients with mild/moderate c...
6/19	Positive (news)	PrEP	*SMSH Sawai Man Singh Hospital, India (Ne...*	HCQ beneficial as preventive drug: SMS doctors told ICMR	PrEP with 4,300 very high risk healthcare workers in a hospital with up to 500+ COVID patients at a time, only 1% cases, all recovered.
6/19	Negative (news)	Late	*NIH, study not available yet (News) (not inc...*	NIH halts clinical trial of hydroxychloroquine	NIH halts late stage trial reporting no harm and no benefit. 470 patients.
6/19	Positive	Late	*Sbidian et al., medRxiv, doi:10.1101/2020.0...*	Hydroxychloroquine with or without azithromycin and in-hospital mortality or discharge i...	Retrospective of 4,642 hospitalized patients in France showing significantly faster discharge with HCQ and HCQ+AZ. No significant effect is seen ...
6/18	Inconc.	Late	*Paccoud et al., Clinical Infectious Diseases,...*	Compassionate use of hydroxychloroquine in clinical practice for patients with mild to se...	Retrospective of 89 hospitalized patients, survival HR 0.89 [0.23-3.47], not statistically significant. Authors note that unmeasured confounders ma...
6/17	Positive	Late	*Xue et al., J. Med. Virology, June 17, 2020, ...*	Hydroxychloroquine treatment in COVID-19: a descriptive observational analysis of 30 ca...	30 hospitalized patients. Early use of HCQ is more effective, 43% reduction in progression from moderate to severe. "Early" is relative here, within ...
6/17	Negative (news)	Late	*World Health Organization, study not avail...*	"Solidarity" clinical trial for COVID-19 treatments	WHO stopped the Solidarity late stage trial of HCQ reporting no benefit. Later news reported "little or no reduction in mortality" [1]. The study has n...
6/16	Positive (news)	PrEP	*WHIP COVID-19 (News) (not included in th...*	Henry Ford Health System still moving forward with hydroxychloroquine study	Ongoing WHIP COVID-19 HCQ PrEP study reports analyzing their data and seeing a significantly improved outcome in a group of COVID-19 patien...
6/12	Theory	Theo...	*Scherrmann, AAPS J 22, 86 (2020), doi:10....*	Intracellular ABCB1 as a Possible Mechanism to Explain the Synergistic Effect of Hydrox...	Theory paper, not included in the study count or percentages. Proposes a new mechanism supporting the synergistic interaction between HCQ+A...
6/12	Negative	Late	*Giacomelli et al., medRxiv, doi:10.1101/20...*	Early administration of lopinavir/ritonavir plus hydroxychloroquine does not alter the clini...	Late stage study of hospitalized patients comparing treatment starting within 5 days versus later. Note that "early" here is only relative - all patient...
6/10	Positive	Early	*Otea et al., medRxiv, doi:10.1101/2020.06....*	A short therapeutic regimen based on hydroxychloroquine plus azithromycin for the treat...	80 moderate cases, HCQ+AZ appears to reduce serious complications and death. Moderate treated cases resulted in hospitalization at the same ...
6/9	Positive	Late	*Pirnay et al., Hosp. Pharm. and Clinician, d...*	Beneficial effect of Hydroxychloroquine-Azithromycin combination in the treatment of eld...	68 very high risk nursing home residents, median age 86, HCQ+AZ early treatment within 2.5 days onset, 2 stopped due to QTc. Only 7 died, signifi...
6/9	Positive	PrEP	*Bhattacharya et al., medRxix, doi:10.1101/...*	Pre exposure Hydroxychloroquine use is associated with reduced COVID19 risk in health...	HCQ reduced cases from 38% to 7%. 106 people. No serious adverse effects.
6/6	Meta (positive)	Early,...	*Million et al., New Microbes and New Infec...*	Clinical Efficacy of Chloroquine derivatives in COVID-19 Infection: Comparative metaanal...	[H]CQ effective and reduces mortality by a factor 3. Meta analysis of 20 studies.
6/5	Negative	Late	*Horby et al., medRxiv, 7/15/2020, doi:10.11...*	Effect of Hydroxychloroquine in Hospitalized Patients with COVID-19: Preliminary results ...	RECOVERY trial reports no significant benefit seen for very late stage very sick patients. Results may be due to the unusually high dosage used [1,...
6/3	Positive (see notes)	PEP	*Boulware et al., NEJM, June 3 2020, doi:10....*	A Randomized Trial of Hydroxychloroquine as Postexposure Prophylaxis for Covid-19	COVID-19 cases are reduced by [49%, 29%, 16%] respectively when taken within ~[70, 94, 118] hours of exposure (including shipping delay). The tr...
5/31	Positive	Early	*Guérin et al., Asian J. Medicine and Health, ...*	Azithromycin and Hydroxychloroquine Accelerate Recovery of Outpatients with Mild/Mod...	Mean clinical recovery time reduced from 26 days (SOC) to 9 days, p<0.0001 (HCQ+AZ) or 13 days, p<0.0001 (AZ). No cardiac toxicity. Small retro...
5/29	Positive	Late	*Ayerbe et al., Journal of Thrombosis and T...*	The association between treatment with heparin and survival in patients with Covid-19	2075 hospital patients in Spain. HCQ reduces mortality from 30% to 13%. Not adjusted for age and gender. HCQ group 10% more males and 6 yea...
5/28	Positive	Late	*Chamieh et al., medRxiv 2020.05.28.20114...*	Viral Dynamics Matter in COVID-19 Pneumonia: the success of early treatment with hydr...	HCQ+AZ potentially explains 94.7% success in treating a fairly complex cohort.
5/28	Positive	PrEP	*Chatterjee et al., Indian J. Med. Res., June ...*	Healthcare workers & SARS-CoV-2 infection in India: A case-control investigation in the ti...	4+ doses of HCQ associated with a significant decline in the odds of getting infected, dose-response relationship exists.
5/28	Positive	Late	*Huang et al., National Science Review, nwa...*	Preliminary evidence from a multicenter prospective observational study of the safety an...	197 CQ patients, 176 control. Mean time to undetectable viral RNA and duration of fever significantly reduced. No serious adverse events.
5/27	Meta	Early	*Risch, American Journal of Epidemiology, k...*	Early Outpatient Treatment of Symptomatic, High-Risk Covid-19 Patients that Should be ...	Five studies, including two controlled clinical trials, have demonstrated significant outpatient treatment efficacy.
5/25	Negative	Late	*Ip et al., medRxiv, doi:10.1101/2020.05.21....*	Hydroxychloroquine and Tocilizumab Therapy in COVID-19 Patients - An Observational St...	Retrospective study of late stage use on 2,512 hospitalized patients showing no significant differences in associated mortality for patients receivi...
5/22	Positive (advisory)	PEP, ...	*ICMR, Indian Council of Medical Research (...*	Revised advisory on the use of Hydroxychloroquine (HCQ) as prophylaxis for SARS-CoV-...	Healthcare workers on HCQ prophylaxis less likely to get COVID. Significant dose-response relationship. Extends recommended HCQ prophylaxis ...
5/22	Retracted	Late	*Mehra et al., The Lancet, May 22, 2020, doi:...*	Hydroxychloroquine or chloroquine with or without a macrolide for treatment of COVID-1...	Incorrect at first read (implausible death, ventilation, and population numbers). This paper was retracted.
5/20	Meta (negative)	Late	*Chacko et al., medRxiv, doi:10.1101/2020.0...*	Hydroxychloroquine in COVID-19: A systematic review and meta-analysis	Meta analysis not seeing a significant effect other than time to resolution of chest CT. Limited by heterogeneous nature of studies, baseline severi...
5/19	Negative	Late	*Singh et al., medRxiv, doi:10.1101/2020.05....*	Outcomes of Hydroxychloroquine Treatment Among Hospitalized COVID-19 Patients in t...	EHR analysis of 3,372 hospitalized COVID-19 patients not showing a significant difference for mortality or the risk of mechanical ventilation. Subj...
5/18	Positive	Late	*Kim et al., medRxiv, doi:10.1101/2020.05.1...*	Treatment Response to Hydroxychloroquine, Lopinavir/Ritonavir, and Antibiotics for Mod...	Retrospective of 97 moderate cases. Time to viral clearance significantly shorter for HCQ+antibiotic. Preprint withdrawn pending peer review.
5/18	Positive	Early	*Ahmad et al., doi:10.1101/2020.05.18.200...*	Doxycycline and Hydroxychloroquine as Treatment for High-Risk COVID-19 Patients: Exp...	54 patients in long term care facilities. 6% death with HCQ+AZ compared to 22% using a naive indirect comparison.
5/16	Inconc.	PrEP	*Macias et al., medRxiv, 10.1101/2020.05.1...*	Similar incidence of Coronavirus Disease 2019 (COVID-19) in patients with rheumatic dis...	Very small retrospective study of rheumatic disease patients, sample size is too small for statistical significance (HCQ 0.5-4.0%, no-HCQ 0.4-2.7%...
5/15	Positive	Late	*Yu et al., Science China Life Sciences, 2020...*	Low Dose of Hydroxychloroquine Reduces Fatality of Critically Ill Patients With COVID-19	Retrospective, 550 critically ill patients. 19% fatality for HCQ versus 47% for non-HCQ.
5/14	Negative	Late	*Mahévas et al., BMJ 2020, 369, doi: https://...*	Clinical efficacy of hydroxychloroquine in patients with covid-19 pneumonia who require ...	Observational study of 181 patients with advanced disease requiring oxygen showing no benefit for HCQ. Power of study appears too low to supp...
5/13	Positive	Late	*Okour et al., Journal of Pharmacokinetics a...*	Hydroxychloroquine and azithromycin as potential treatments for COVID-19; clinical stat...	Odds of PCR-positive decrease by 53% for each unit increase in HCQ log-concentration. Similarly, the odds decrease by 61%, and by 12% for each ...
5/11	Negative	Late	*Rosenberg et al., JAMA, May 11, 2020, doi:...*	Association of Treatment With Hydroxychloroquine or Azithromycin With In-Hospital Mor...	Restrospective observational late stage study showing no significant differences but calling for clinical trials. Zervos et al. [1] point out serious limi...
5/10	Positive	Late	*Alberici et al., Kidney Int., 98:1, 20-26, July ...*	A report from the Brescia Renal COVID Task Force on the clinical characteristics and sho...	Analysis of 94 hemodialysis COVID-19 positive patients. Reduction in death seen with HCQ but p=0.12, OR 0.44 (0.16–1.24).
5/8	Inconc.	Late	*Carlucci et al., doi:10.1101/2020.05.02.200...*	Hydroxychloroquine and azithromycin plus zinc vs hydroxychloroquine and azithromycin ...	Observational retrospective. Addition of Zinc to HCQ+AZ reduces mortality.
5/7	Theory	Theo...	*Derendorf, H., Int. J. Antimicrobial Agents, ...*	Excessive lysosomal ion-trapping of hydroxychloroquine and azithromycin	Discusses pharmacokinetic properties of HCQ+AZ as a potential underlying mechanism of the observed antiviral effects.
5/7	Inconc.	Late	*Geleris et al., NEJM, May 7, 2020, doi:10.10...*	Observational Study of Hydroxychloroquine in Hospitalized Patients with Covid-19	There appears to be a major error in this paper. Before propensity matching, 38 control patients had hypertension. After propensity matching, 146 ...
5/7	Positive (news)	N/A	*Sermo (News) (not included in the study c...*	Sermo reports: COVID-19 treatment trends over 6 weeks and 33,700 interviews: Usage, e...	HCQ used by 55% of physicians worldwide for COVID. Survey of 6,150 physicians.
5/6	Animal	Anim...	*Maisonnasse et al., Nature, 2020, doi:10.10...*	Hydroxychloroquine use against SARS-CoV-2 infection in non-human primates	Monkey study which reports no effect of HCQ or HCQ+AZ. However, there are several signs of effectiveness despite the very small sample sizes a...
5/5	Positive	Late	*Membrillo de Novales et al., Preprints 202...*	Early Hydroxychloroquine Is Associated with an Increase of Survival in COVID-19 Patient...	166 patients hospitalised with COVID-19, HCQ increased survival 1.4 - 1.8 times when patients admitted in early stages. Early is relative to hospita...
5/5	Positive	Early,...	*Million et al., Travel Med Infect Dis, 2020 ...*	Early Treatment of COVID-19 Patients With Hydroxychloroquine and Azithromycin: A Retr...	Retrospective 1061 patients. HCQ+AZ safe and results in a low fatality rate.
5/5	Inconc.	PrEP	*Gendelman et al., Autoimmunity Reviews, ...*	Continuous Hydroxychloroquine or Colchicine Therapy Does Not Prevent Infection With S...	Very small study of rheumatic disease/autoimmune disorder patients showing no significant difference but with only 3 chronic HCQ patient case...
5/5	Positive	PrEP	*Mitchell et al., SSRN, doi:10.2139/ssrn.358...*	Markedly Lower Rates of Coronavirus Infection and Fatality in Malaria-Endemic Regions ...	Analysis of COVID-19 amongst 2.4B people shows a wide counterintuitive disparity between well-developed and less-developed countries, with m...
5/1	Safety	N/A	*Mercuro et al., JAMA Cardiol., May 1, 2020,...*	Risk of QT Interval Prolongation Associated With Use of Hydroxychloroquine With or With...	Study of 90 hospitalized patients given HCQ, 53 also receiving AZ, 53% hypertension, 29% diabetes mellitus, baseline median QTc 473ms for HCQ,...
5/1	Safety	N/A	*Bessière et al., JAMA Cardiol., May 1, 2020,...*	Assessment of QT Intervals in a Case Series of Patients With Coronavirus Disease 2019 (...	Study of 40 very serious condition ICU patients, 75% required invasive mechanical ventilation, 63% received vasoactive drugs, 50% received other ...
5/2	Positive (news)	Late	*Seydi (News) (not included in the study co...*	Coronavirus: a study in Senegal confirms the effectiveness of hydroxychloroquine	Preliminary results of Senegal trial with 181 patients showing faster recovery with HCQ, and even faster recovery with HCQ+AZ.
4/30	Positive	Early	*Meo et al., Eur. Rev. Med. Pharmacol. Sci. 2...*	Efficacy of chloroquine and hydroxychloroquine in the treatment of COVID-19	Analysis of COVID-19 and malaria, finding that COVID-19 is highly pandemic in countries where malaria is least pandemic, and vice versa, suggest...
4/29	Safety	N/A	*Saleh et al., Circulation: Arrhythmia and Ele...*	The Effect of Chloroquine, Hydroxychloroquine and Azithromycin on the Corrected QT Int...	201 hospitalized patients. No serious side effects of HCQ. No instances of Torsade de pointes, or arrhythmogenic death were reported. They repo...
4/25	In Vitro	In Vit...	*Andreani et al., Microbial Pathogenesis, doi...*	In vitro testing of combined hydroxychloroquine and azithromycin on SARS-CoV-2 shows...	HCQ and AZ has a synergistic effect in vitro on SARS-CoV-2 at concentrations compatible with that obtained in human lung.
4/24	Inconc.	Early	*Ashraf et al., medRxiv doi:10.1101/2020.04...*	COVID-19 in Iran, a comprehensive investigation from exposure to treatment outcomes	Small limited trial with 100 patients concluding that HCQ improved clinical outcome.
4/21	Positive	Early	*Izoulet M., SSRN, doi:10.2139/ssrn.357589...*	Countries which Primarily Use Antimalarial Drugs As COVID-19 Treatment See Slower Dy...	Compares the dynamics of daily deaths in the 10 days following the 3rd death in countries using and not using [H]CQ, showing dramatically lower...
4/21	Negative	Late	*Magagnoli et al., Med (2020), doi:10.1016/j...*	Outcomes of hydroxychloroquine usage in United States veterans hospitalized with Covi...	Retrospective 368 hospitalized patients, no significant reduction in mortality or the need for mechanical ventilation with HCQ or HCQ+AZ. Study n...
4/17	Positive	PEP	*Lee et al., Int. J. Antimicrob. Agents, 2020, ...*	Can Post-Exposure Prophylaxis for COVID-19 Be Considered as an Outbreak Response S...	Post exposure prophylaxis of 211 high-risk people after major exposure event in a long term care hospital, showing no positive cases after 14 days.
4/16	Negative	Late	*Borba et al., JAMA Network Open, doi:10.1...*	Chloroquine diphosphate in two different dosages as adjunctive therapy of hospitalized p...	Increased incidence of prolonged QT and death in high dose treatment arm. Patients >75 only enrolled in high dose arm, age of high dose arm sig...
4/15	Positive	Early	*Esper et al., Prevent Senior Institute, São P...*	Empirical treatment with hydroxychloroquine and azithromycin for suspected cases of C...	636 patients. HCQ+AZ reduced hospitalization 79% when used within 7 days (65% overall). Non-randomized.
4/15	Theory	Theo...	*Brufsky, A., J. Medical Virology, doi:10.100...*	Hyperglycemia, hydroxychloroquine, and the COVID-19 pandemic	Theory on the effectiveness of HCQ. HCQ has been shown to block the polarization of macrophages to an M1 inflammatory subtype and is predic...
4/14	Negative	Late	*Tang et al., BMJ 2020, 369, doi:10.1136/b...*	Hydroxychloroquine in patients with COVID-19: an open-label, randomized, controlled trial	150 patients very late stage RCT. No significant difference. More symptomatic relief with HCQ. Treatment very late, average 16.6 days after sympt...
4/13	Positive	Late	*Gao et al., Biosci Trends, May 21, 2020, 14:...*	Update on Use of Chloroquine/Hydroxychloroquine to Treat Coronavirus Disease 2019 (C...	Increasing evidence from completed clinical studies shows CQ and HCQ effective (HCQ more effective).
4/12	Negative	Late	*Barbosa et al., Preprint (Preprint)*	Clinical outcomes of hydroxychloroquine in hospitalized patients with COVID-19: a quasi-...	Small retrospective study with 63 patients (32 treated with HCQ), showing no effectiveness, however the baseline state of each arm significantly ...
4/11	Positive	Early	*Gautret et al., Travel Medicine and Infectio...*	Clinical and microbiological effect of a combination of hydroxychloroquine and azithrom...	Pilot study suggesting improvement with HCQ+AZ and recommending further study.
4/10	Meta (negative)	Late	*Lover, medRxiv, doi:10.1101/2020.03.22.2...*	Quantifying treatment effects of hydroxychloroquine and azithromycin for COVID-19: a se...	Secondary analysis of Gautret et al. showing "modest to no impact of HCQ treatment, with more significant effects from [HCQ+AZ]".
4/1	Positive	Late	*Huang et al., Journal of Molecular Cell Biol...*	Treating COVID-19 with Chloroquine	22 patients. All CQ patients discharged by day 14 versus 50% of Lopinavir/Rotinavir patients. Symptom onset to treatment 2.5 days for CQ vs. 6.5 ...
3/31	Positive	Late	*Chen et al., medRxiv doi:10.1101/2020.03....*	Efficacy of hydroxychloroquine in patients with COVID-19: results of a randomized clinical...	62 patients. RCT showing significantly faster recovery with HCQ. 13% progressed to severe cases in the control group, versus 0% for the treatmen...
3/31	In Vitro	In Vit...	*Clementi et al., Front. Microbiol., 10 July 20...*	Combined Prophylactic and Therapeutic Use Maximizes Hydroxychloroquine Anti-SARS-...	In vitro study, not included in the study count or percentages, showing greater inhibition for combined pre and post-exposure treatment for Vero E...
3/28	Negative	Late	*Molina et al., Médecine et Maladies Infecti...*	No evidence of rapid antiviral clearance or clinical benefit with the combination of hydrox...	11 patients with severe cases. No evidence of benefit for HCQ.
3/26	Positive (news)	Late	*Zhong Nanshan (钟南山) (News) (not inclu...*	Efficacy and safety of chloroquine for treatment of COVID-19. An open-label, multi-center,...	197 patients. HCQ effective. Viral RNA negative in 95.9% versus 79.6% control. Median time to negative tests 3 days versus 9 days for control.
3/24	Theory	Theo...	*Pagliano et al., Clin. Infect. Dis., 2020 Mar ...*	Is Hydroxychloroquine a Possible Post-Exposure Prophylaxis Drug to Limit the Transmiss...	CQ and HCQ inhibit replication at early stages of infection, no similar effect reported for other drugs which are only able to interfere after cell infec...
3/23	Theory	Theo...	*Hu et al., Nature Nanotechnology, 15, 247–...*	Insights from nanomedicine into chloroquine efficacy against COVID-19	CQ is known in nanomedicine research for the investigation of nanoparticle uptake in cells, and may have potential for the treatment of COVID-19.
3/21	Positive (advisory)	PrEP	*ICMR, Indian Council of Medical Research (...*	Advisory on the use of hydroxy-chloroquine as prophylaxis for SARS-CoV-2 infection	Recommends HCQ for prophylaxis in asymptomatic healthcare workers as found effective in-vitro and in-vivo.
3/20	Positive (news)	Late	*Hu et al., Shanghai Combined Task Force o...*	Shanghai Experience of COVID-19 Management	Clinical studies of HCQ with 184 cases and 21 hospitals show HCQ is effective.
3/18	In Vitro	In Vit...	*Liu et al., Cell Discovery 6, 16 (2020), doi:10...*	Hydroxychloroquine, a less toxic derivative of chloroquine, is effective in inhibiting SARS-...	HCQ effective *in vitro* and less toxic than CQ. In addition to direct antiviral activity, HCQ is a safe and successful anti-inflammatory agent that has ...
3/17	Inconc.	Early	*Gautret et al., Int. J. of Antimicrobial Agent...*	Hydroxychloroquine and azithromycin as a treatment of COVID-19: results of an openlab...	HCQ was found to be significantly associated with viral load reduction / elimination, which was enhanced with AZ. We note that this early and sm...
3/17	Review	N/A	*Sahraei et al., Int. J. Antimicrobial Agents, ...*	Aminoquinolines against coronavirus disease 2019 (COVID-19): chloroquine or hydroxyc...	Discussion of mechanisms of action, CQ vs. HCQ, early studies, safety.
3/13	Review	N/A	*Todaro and Rigano (Preprint) (not included...*	An Effective Treatment for Coronavirus (COVID-19)	Discussion of existing research, treatment guidelines, and mechanisms of action for CQ and HCQ, recommending use.
3/12	Theory	Theo...	*Devaux et al., International Journal of Anti...*	New insights on the antiviral effects of chloroquine against coronavirus: what to expect f...	Discusses mechanisms of CQ interference with the SARS-CoV-2 replication cycle.
3/10	Meta (positive)	N/A	*Cortegiani et al., J. Crit. Care, June 2020, 5...*	A Systematic Review on the Efficacy and Safety of Chloroquine for the Treatment of COV...	Review of six articles and 23 ongoing clinical trials in China recommending research and clinical use adhering to MEURI.
3/9	In Vitro	N/A	*Yao et al., Clin. Infect. Dis., 2020 Mar 9, doi:...*	In Vitro Antiviral Activity and Projection of Optimized Dosing Design of Hydroxychloroqui...	HCQ is more potent than CQ in vitro for inhibiting SARS-CoV-2. Simulates HCQ concentration in lung fluid and provides dosing recommendations.
3/6	Negative	Late	*Chen et al., J. Zhejiang University (Med Sci)...*	A pilot study of hydroxychloroquine in treatment of patients with common coronavirus di...	30 moderate hospitalized cases, all recovered. Time to RNA negative comparable. Less frequent radiological progression with HCQ but not statist...
3/4	Positive	Late	*Colson et al., Int J Antimicrob Agents, doi: ...*	Chloroquine and Hydroxychloroquine as Available Weapons to Fight COVID-19	Recommending CQ and HCQ for COVID-19 based on 20 clinical studies in China and a strong rationale for use.
2/20	Positive	Late	*Jiang et al., Chin. J. Tuberc. Respir. Dis., 20...*	Expert Consensus on Chloroquine Phosphate for the Treatment of Novel Coronavirus Pn...	Early trials in China show CQ results in shorter hospital stays and improved patient outcomes.
2/19	Positive	Late	*Gao et al., BioScience Trends, 2020, doi:10....*	Breakthrough: Chloroquine phosphate has shown apparent efficacy in treatment of COVI...	Results from 15 clinical trials in China showing CQ is effective.
2/17	Positive (news)	Late	*Sun Yanrong, deputy head of the China Nat...*	Antimalarial drug confirmed effective on COVID-19	HCQ under clinical trials in >10 hospitals in China and has shown fairly good efficacy.
2/4	In Vitro	In Vit...	*Wang et al., Cell Res. 30, 269–271, doi:L10....*	Remdesivir and chloroquine effectively inhibit the recently emerged novel coronavirus (2...	In vitro study, not included in the study count or percentages. Remdesivir and CQ potently blocked virus infection in vitro.
2014	In Vitro	In Vit...	*de Wilde et al., Antimicrobial Agents and C...*	Screening of an FDA-Approved Compound Library Identifies Four Small-Molecule Inhibito...	CQ inhibits SARS-CoV, MERS-CoV, and HCoV-229E-GFP replication in the low-micromolar range.
2012	Animal	Anim...	*Yan et al., Cell Research, 23, 300–302, doi:...*	Anti-malaria drug chloroquine is highly effective in treating avian influenza A H5N1 virus i...	CQ, a known autophagy inhibitor that is in clinical use, can efficiently ameliorate acute lung injury and dramatically improve the survival rate in mic...
2009	Animal	Anim...	*Keyaerts et al., Antimicrob. Agents Chemot...*	Antiviral Activity of Chloroquine against Human Coronavirus OC43 Infection in Newborn ...	CQ inhibits HCoV-OC43 replication in HRT-18 cells. A lethal HCoV-OC43 infection in newborn C57BL/6 mice can be treated with CQ acquired trans...
2008	In Vitro	In Vit...	*Kono et al., Antiviral Research, 77:2, Februa...*	Inhibition of human coronavirus 229E infection in human epithelial lung cells (L132) by c...	CQ significantly decreased viral replication of HCoV-229E at concentrations lower than in clinical usage. CQ affects the activation of p38 mitogen-...
2006	In Vitro	In Vit...	*Savarino et al., Lancet Infect. Dis., doi:10.1...*	New insights into the antiviral effects of chloroquine	Update to 2003 paper, not included in the study count or percentages. Hypothesis of CQ inhibiting SARS replication has been confirmed in two in-...
2005	In Vitro	In Vit...	*Vincent et al., Virol. J. 2:69, 2005, doi:10.11...*	Chloroquine is a potent inhibitor of SARS coronavirus infection and spread	*In vitro* study, SARS-CoV-1, not included in the study count or percentages. CQ has strong antiviral effects on SARS CoV infection when cells treat...
2004	In Vitro	In Vit...	*Keyaerts et al., Biochem. Biophys. Res. Co...*	In vitro inhibition of severe acute respiratory syndrome coronavirus by chloroquine	*In vitro* study, SARS-CoV-1, not included in the study count or percentages. IC50 of CQ for antiviral activity (8.8) is significantly lower than cytostati...
2003	Theory	Theo...	*Savarino et al., Lancet Infect. Dis., doi:10.1...*	Effects of chloroquine on viral infections: an old drug against today's diseases	Not included in the study count or percentages. Discussion/review noting that CQ exerts antiviral effects, inhibiting the replication of several virus...
1889	Inconc. (news)	N/A	*Edwin Wiley Grove (News) (not included in ...*	Laxative Bromo Quinine	Quinine has been used for respiratory infections since 1889. Not included in the study count or percentages, just as an interesting observation.

Note: In Vitro, Meta, Theory, Safety, Review, News, and Retracted items are not included in the percentages and study count. There is a total of 121 items. Positive/negative effects vary in degree and certainty, please read the papers or descriptions thereof for more details. Every study has some limitations when considered in isolation (for example confounding factors; sub-optimal treatment regimens; dosing regimens that may be too low, too high, or insufficiently account for the long half-life of HCQ; large treatment delays; small sample sizes; lack of focus on severity; reliance on Internet surveys; and patient characteristics very different from the most at-risk population).

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