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Source: *Association of American Physicians and Surgeons*

January 15, 2021 14:07 ET

Association of American Physicians and Surgeons (AAPS) Applauds NIH Revised Stance on Ivermectin for COVID-19

TUCSON, Ariz., Jan. 15, 2021 (GLOBE NEWSWIRE) -- The National Institutes (NIH) has issued a new statement on the use of the anti-parasitic drug ivermectin for the treatment of COVID-19. Previously, it recommended against this treatment, but now states that its Panel "has determined that there are insufficient data to recommend either for or against the use of ivermectin for the treatment of COVID-19."

The Association of American Physicians and Surgeons (AAPS) notes that there are now 49 ivermectin studies summarized on c19study.com, 100 percent of which show favorable results. In contrast, there are very few studies of the antibody cocktails now being used under an Emergency Use Authorization.

NIH concludes from its current analysis that "results from adequately powered, well-designed, and well-conducted clinical trials are needed to provide further guidance on the role of ivermectin in the treatment of COVID-19."

The NIH may be responding to requests related to the testimony strongly favoring ivermectin in a Dec 8 Senate hearing before the Committee on Homeland Security and Governmental Affairs.

While awaiting further studies, patients are dying, AAPS points out. More than a billion doses of this very safe drug have been administered since 1981. Yet many medical facilities and many physicians refuse to prescribe it for COVID-19, citing NIH guidance.

"Perhaps with this change, patients won't need a court order to get a lifesaving drug," stated AAPS executive director Jane Orient, M.D. A patient in Buffalo, who was dying on a ventilator, had a dramatic turnaround when family members persuaded an intensive care doctor to prescribe ivermectin. But doctors refused to allow further doses when her condition declined. State Supreme Court Judge Henry A. Nowak ordered the drug to be re-started, and the patient again improved.

"Once a drug is approved, it may be lawfully used for new indications, and at least 20 percent of prescriptions are for 'off-label' uses," Dr. Orient stated. "To have a doctor withdraw a drug that appears to be saving a patient's life, because a federal bureaucracy thinks it hasn't been studied enough for that use, is shocking to those who believe in the traditional ethic of Hippocrates."

The Association of American Physicians and Surgeons (AAPS) has represented physicians in all specialties nationwide since 1943. It provides information on early home treatment for COVID-19. Its motto is *omnia pro aegroto* (everything for the patient).

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Ivermectin

Last Updated: February 11, 2021

Ivermectin is a Food and Drug Administration (FDA)-approved antiparasitic drug that is used to treat several neglected tropical diseases, including onchocerciasis, helminthiases, and scabies.[1] It is also being evaluated for its potential to reduce the rate of malaria transmission by killing mosquitoes that feed on treated humans and livestock.[2] For these indications, ivermectin has been widely used and is generally well tolerated.[1,3] Ivermectin is not approved by the FDA for the treatment of any viral infection.

Proposed Mechanism of Action and Rationale for Use in Patients With COVID-19

Reports from in vitro studies suggest that ivermectin acts by inhibiting the host importin alpha/beta-1 nuclear transport proteins, which are part of a key intracellular transport process that viruses hijack to enhance infection by suppressing the host's antiviral response.[4,5] In addition, ivermectin docking may interfere with the attachment of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) spike protein to the human cell membrane.[6] Ivermectin is thought to be a host-directed agent, which may be the basis for its broad-spectrum activity in vitro against the viruses that cause dengue, Zika, HIV, and yellow fever.[4,7-9] Despite this in vitro activity, no clinical trials have reported a clinical benefit for ivermectin in patients with these viruses. Some studies of ivermectin have also reported potential anti-inflammatory properties, which have been postulated to be beneficial in people with COVID-19.[10-12]

Some observational cohorts and clinical trials have evaluated the use of ivermectin for the prevention and treatment of COVID-19. Data from some of these studies can be found in Table 2c.

Recommendation

- There are insufficient data for the COVID-19 Treatment Guidelines Panel (the Panel) to recommend either for or against the use of ivermectin for the treatment of COVID-19. Results from adequately powered, well-designed, and well-conducted clinical trials are needed to provide more specific, evidence-based guidance on the role of ivermectin in the treatment of COVID-19.

Rationale

Ivermectin has been shown to inhibit the replication of SARS-CoV-2 in cell cultures.[13] However, pharmacokinetic and pharmacodynamic studies suggest that achieving the plasma concentrations necessary for the antiviral efficacy detected in vitro would require administration of doses up to 100-fold higher than those approved for use in humans.[14,15] Even though ivermectin appears to accumulate in the lung tissue, predicted systemic plasma and lung tissue concentrations are much lower than 2 μM, the half-maximal inhibitory concentration (IC_{50}) against SARS-CoV-2 in vitro.[16-19] Subcutaneous administration of ivermectin 400 μg/kg had no effect on SARS-CoV-2 viral loads in hamsters. However, there was a reduction in olfactory deficit (measured using a food-finding test) and a reduction in the interleukin (IL)-6:IL-10 ratio in lung tissues.[20]

Ivermectin is used in children weighing >15 kg for the treatment of helminthic infections, pediculosis, and scabies. The safety of using ivermectin in children weighing <15 kg has not been well established. Ivermectin is generally well tolerated in children, with a side effect profile similar to the one seen in adults. Currently, there are no available pediatric data from clinical trials to inform the use of ivermectin for the treatment or prevention of COVID-19 in children.

Clinical Trials

Several clinical trials that are evaluating the use of ivermectin for the treatment of COVID-19 are currently underway or in development. Please see ClinicalTrials.gov for the latest information.

References +

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Ivermectin is effective for COVID-19: real-time meta analysis of 41 studies

Covid Analysis, Nov 26, 2020 (Version 34, Feb 18, 2021)

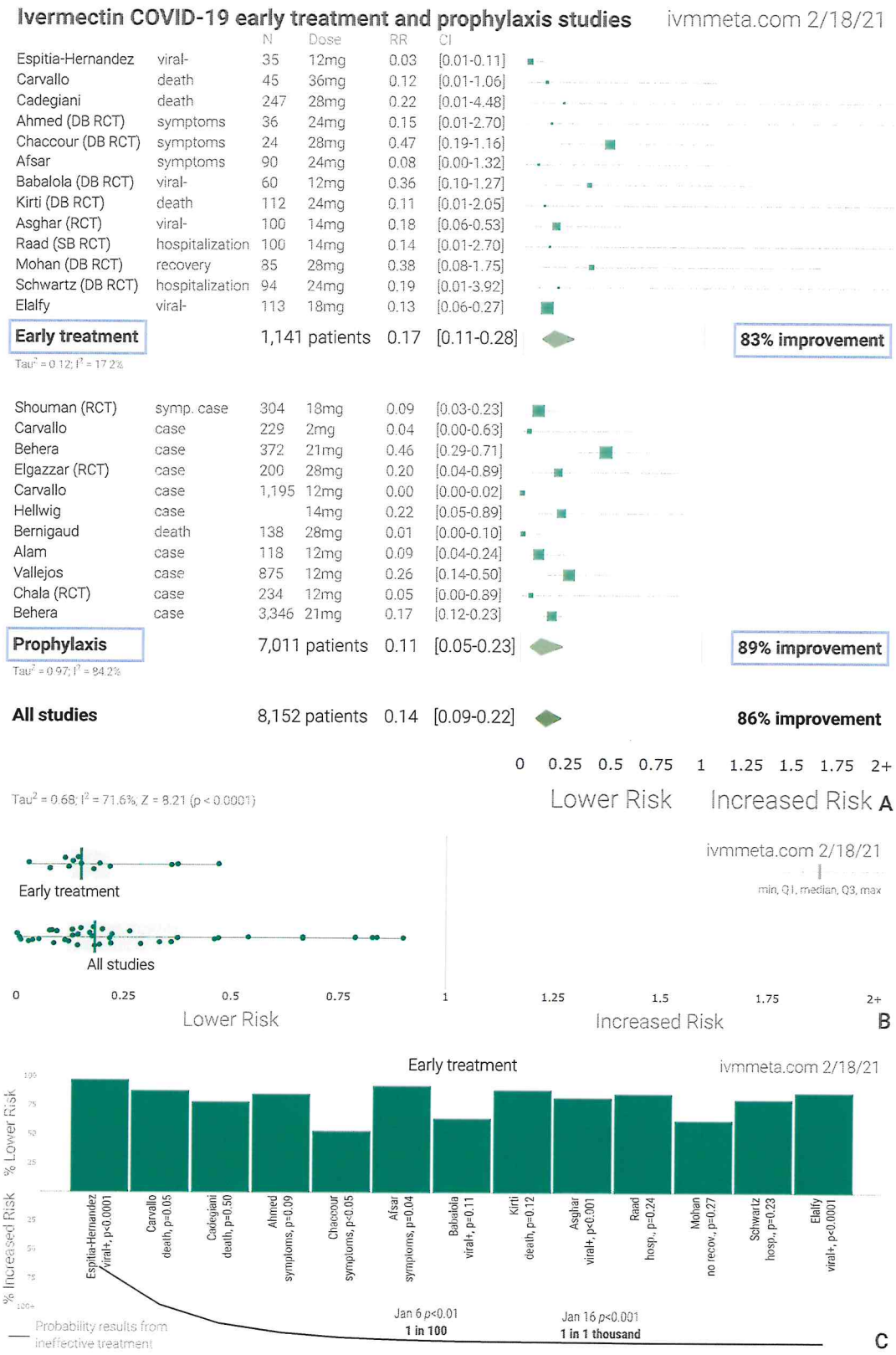
https://ivmmeta.com/

- 100% of the 41 studies to date report positive effects. Random effects meta-analysis for early treatment and pooled effects shows a reduction of 83%, RR 0.17 [0.11-0.28]. Prophylactic use shows a reduction of 89%, RR 0.11 [0.05-0.23]. Mortality results show 78% lower mortality, RR 0.22 [0.12-0.41] for all treatment delays, and 86% lower, RR 0.14 [0.03-0.62] for early treatment.
- 100% of the 20 Randomized Controlled Trials (RCTs) report positive effects, with an estimated reduction of 72%, RR 0.28 [0.17-0.47].
- The probability that an ineffective treatment generated results as positive as the 41 studies to date is estimated to be 1 in 2 trillion (p = 0.00000000000045).

Early treatment	83% improvement	RR 0.17 [0.11-0.28]
Late treatment	52% improvement	RR 0.48 [0.35-0.64]
Prophylaxis	89% improvement	RR 0.11 [0.05-0.23]

Total	41 studies	304 authors	14,830 patients
RCT	20 studies	153 authors	2,793 patients

Show forest plot for:
All studies
With exclusions
Mortality results
Viral clearance
Case results
RCT mortality
All RCTs


Ivermectin COVID-19 early treatment and prophylaxis studies
ivmmeta.com 2/18/21
N Dose RR CI
Espitia-Hernandez viral- 35 12mg 0.03 [0.01-0.11]
Carvallo death 45 36mg 0.12 [0.01-1.06]
Cadegiani death 247 28mg 0.22 [0.01-4.48]
Ahmed (DB RCT) symptoms 36 24mg 0.15 [0.01-2.70]
Chaccour (DB RCT) symptoms 24 28mg 0.47 [0.19-1.16]
Afsar symptoms 90 24mg 0.08 [0.00-1.32]
Babalola (DB RCT) viral- 60 12mg 0.36 [0.10-1.27]
Kirti (DB RCT) death 112 24mg 0.11 [0.01-2.05]
Asghar (RCT) viral- 100 14mg 0.18 [0.06-0.53]
Raad (SB RCT) hospitalization 100 14mg 0.14 [0.01-2.70]
Mohan (DB RCT) recovery 85 28mg 0.38 [0.08-1.75]
Schwartz (DB RCT) hospitalization 94 24mg 0.19 [0.01-3.92]
Elalfy viral- 113 18mg 0.13 [0.06-0.27]
Early treatment 1,141 patients 0.17 [0.11-0.28] 83% improvement
Tau² = 0.12; I² = 17.2%
Shouman (RCT) symp. case 304 18mg 0.09 [0.03-0.23]
Carvallo case 229 2mg 0.04 [0.00-0.63]
Behera case 372 21mg 0.46 [0.29-0.71]
Elgazzar (RCT) case 200 28mg 0.20 [0.04-0.89]
Carvallo case 1,195 12mg 0.00 [0.00-0.02]
Hellwig case 14mg 0.22 [0.05-0.89]
Bernigaud death 138 28mg 0.01 [0.00-0.10]
Alam case 118 12mg 0.09 [0.04-0.24]
Vallejos case 875 12mg 0.26 [0.14-0.50]
Chala (RCT) case 234 12mg 0.05 [0.00-0.89]
Behera case 3,346 21mg 0.17 [0.12-0.23]
Prophylaxis 7,011 patients 0.11 [0.05-0.23] 89% improvement
Tau² = 0.97; I² = 84.2%
All studies 8,152 patients 0.14 [0.09-0.22] 86% improvement
0 0.25 0.5 0.75 1 1.25 1.5 1.75 2+
Lower Risk Increased Risk A
Tau² = 0.68; I² = 71.6%, Z = 8.21 (p < 0.0001)
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min, Q1, median, Q3, max
Early treatment
All studies
0 0.25 0.5 0.75 1 1.25 1.5 1.75 2+
Lower Risk Increased Risk B
Early treatment
ivmmeta.com 2/18/21
% Lower Risk
% Increased Risk
Espitia-Hernandez viral+, p<0.0001
Carvallo death, p=0.05
Cadegiani death, p=0.50
Ahmed symptoms, p=0.09
Chaccour symptoms, p<0.05
Afsar symptoms, p=0.04
Babalola viral+, p=0.11
Kirti death, p=0.12
Asghar viral+, p<0.001
Raad hosp., p=0.24
Mohan no recov., p=0.27
Schwartz hosp., p=0.23
Elalfy viral+, p<0.0001
Probability results from ineffective treatment
Jan 6 p<0.01
1 in 100
Jan 16 p<0.001
1 in 1 thousand
C

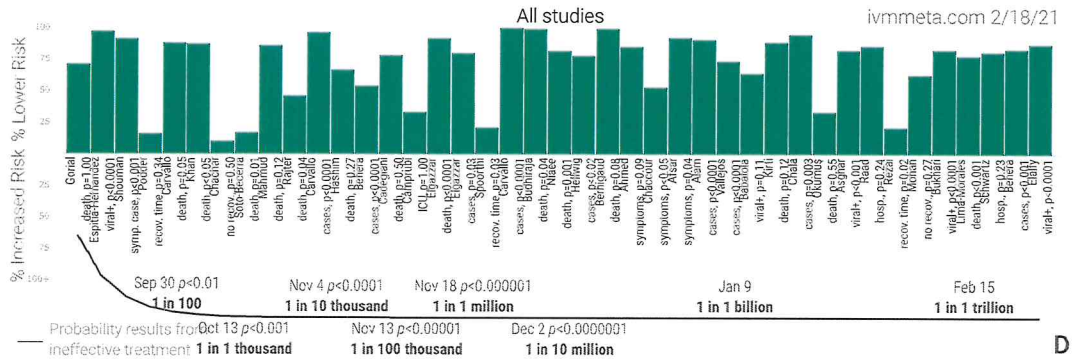

Figure 1. *A. Random effects meta-analysis excluding late treatment. Simplified dosages are shown for comparison, these are the total dose in the first two days for treatment, and the monthly dose for prophylaxis, for a 70kg person. For full details see the appendix.* ***B.*** *Scatter plot showing the distribution of effects reported in early treatment studies and in all studies.* ***C and D.*** *Chronological history of all reported effects, with the probability that the observed frequency of positive results occurred due to random chance from an ineffective treatment.*

Introduction

We analyze all significant studies concerning the use of ivermectin for COVID-19. Search methods, inclusion criteria, effect extraction criteria (more serious outcomes have priority), all individual study data, PRISMA answers, and statistical methods are detailed in Appendix 1. We present random effects meta-analysis results for all studies, for studies within each treatment stage, for mortality results only, for COVID-19 case results only, and for Randomized Controlled Trials (RCTs) only.

We also perform a simple analysis of the distribution of study effects. If treatment was not effective, the observed effects would be randomly distributed (or more likely to be negative if treatment is harmful). We can compute the probability that the observed percentage of positive results (or higher) could occur due to chance with an ineffective treatment (the probability of >= *k* heads in *n* coin tosses, or the one-sided sign test / binomial test). Analysis of publication bias is important and adjustments may be needed if there is a bias toward publishing positive results.

Figure 2 shows stages of possible treatment for COVID-19. **Prophylaxis** refers to regularly taking medication before becoming sick, in order to prevent or minimize infection. **Early Treatment** refers to treatment immediately or soon after symptoms appear, while **Late Treatment** refers to more delayed treatment.

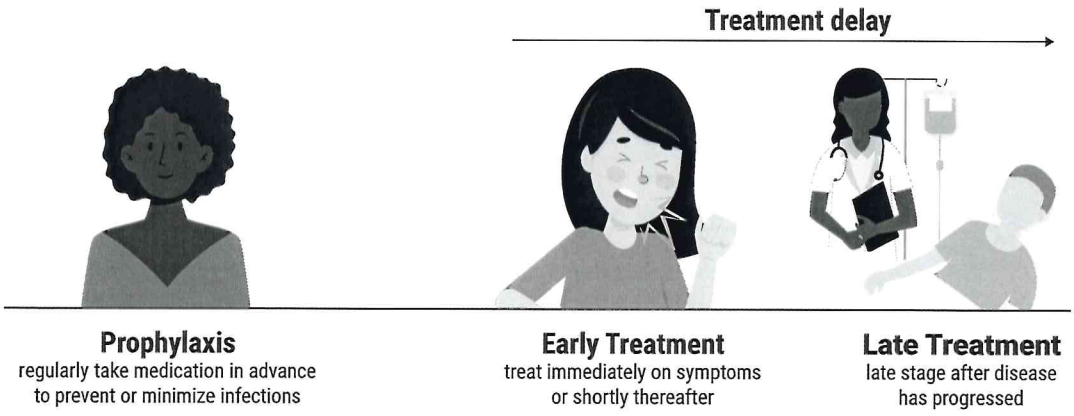

Figure 2. *Treatment stages.*

Results

Figure 3, 4, and 5 show results by treatment stage. Figure 6, 7, 8, and 9 show forest plots for a random effects meta-analysis of all studies with pooled effects, and for studies reporting mortality results, COVID-19 case results, and viral clearance results only. Table 1 summarizes the results.

Treatment time	Number of studies reporting positive results	Total number of studies	Percentage of studies reporting positive results	Probability of an equal or greater percentage of positive results from an ineffective treatment	Random effects meta-analysis results
Early treatment	13	13	**100%**	**0.00012** 1 in 8 thousand	**83%** improvement RR 0.17 [0.11-0.28] p < 0.0001
Late treatment	17	17	**100%**	**0.0000076** 1 in 131 thousand	**52%** improvement RR 0.48 [0.35-0.64] p < 0.0001
Prophylaxis	11	11	**100%**	**0.00049** 1 in 2 thousand	**89%** improvement RR 0.11 [0.05-0.23] p < 0.0001
All studies	41	41	**100%**	**0.00000000000045** 1 in 2 trillion	**76%** improvement RR 0.24 [0.18-0.33] p < 0.0001

Table 1. *Results by treatment stage.*

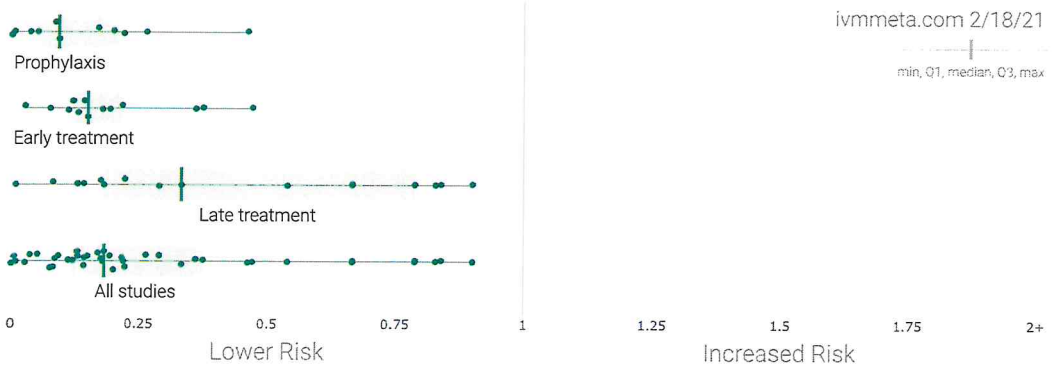

Figure 3. *Results by treatment stage.*

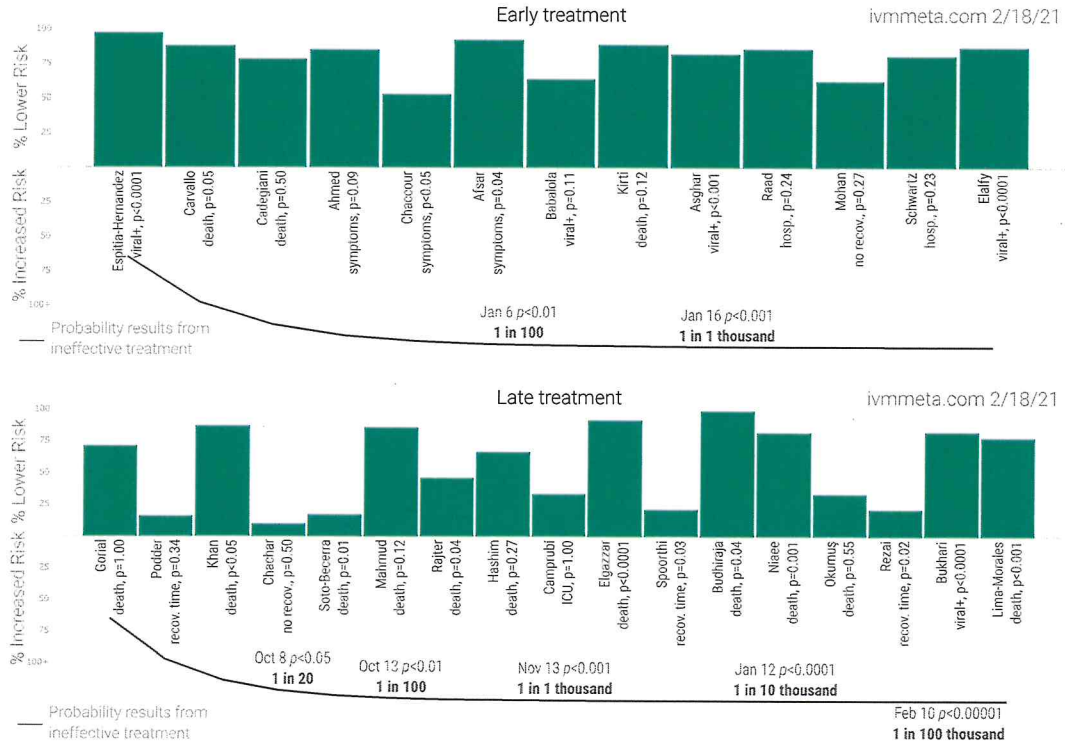

Figure 4. *Chronological history of early and late treatment results, with the probability that the observed frequency of positive results occurred due to random chance from an ineffective treatment.*

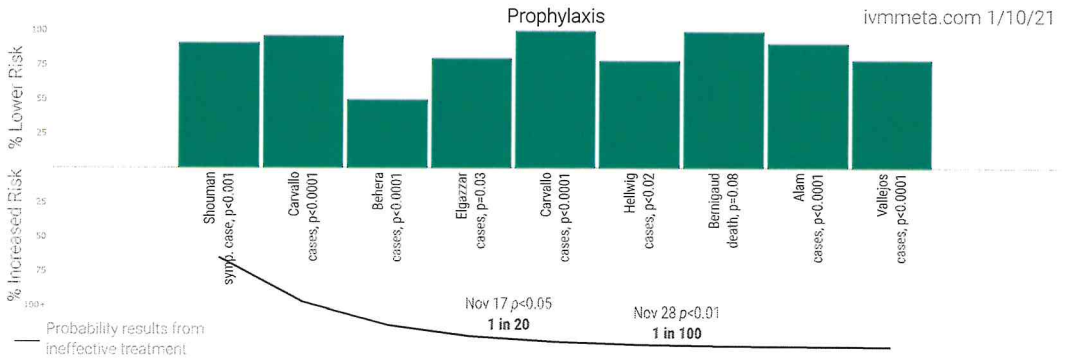

Figure 5. *Chronological history of prophylaxis results.*

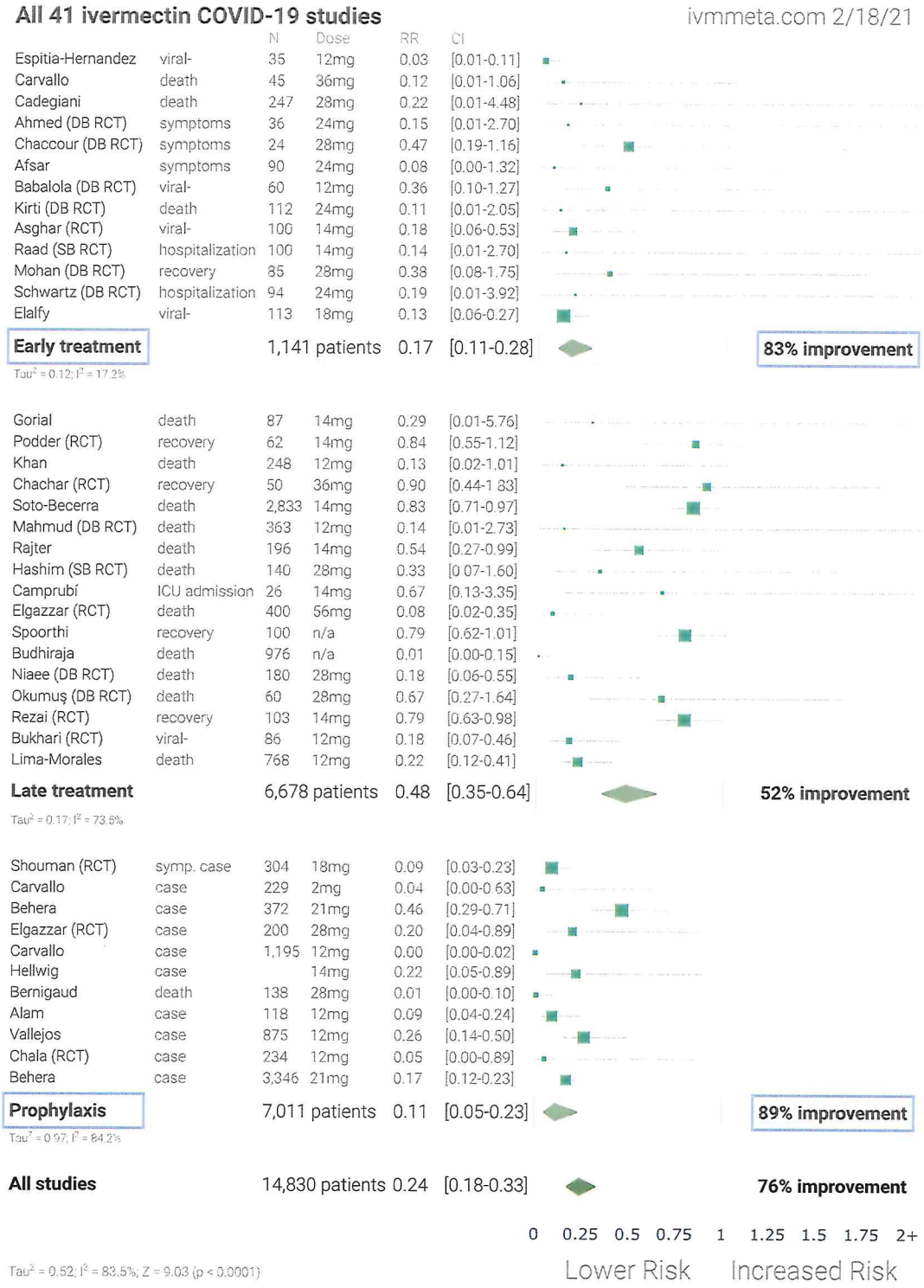

Figure 6. *Random effects meta-analysis for all studies.*

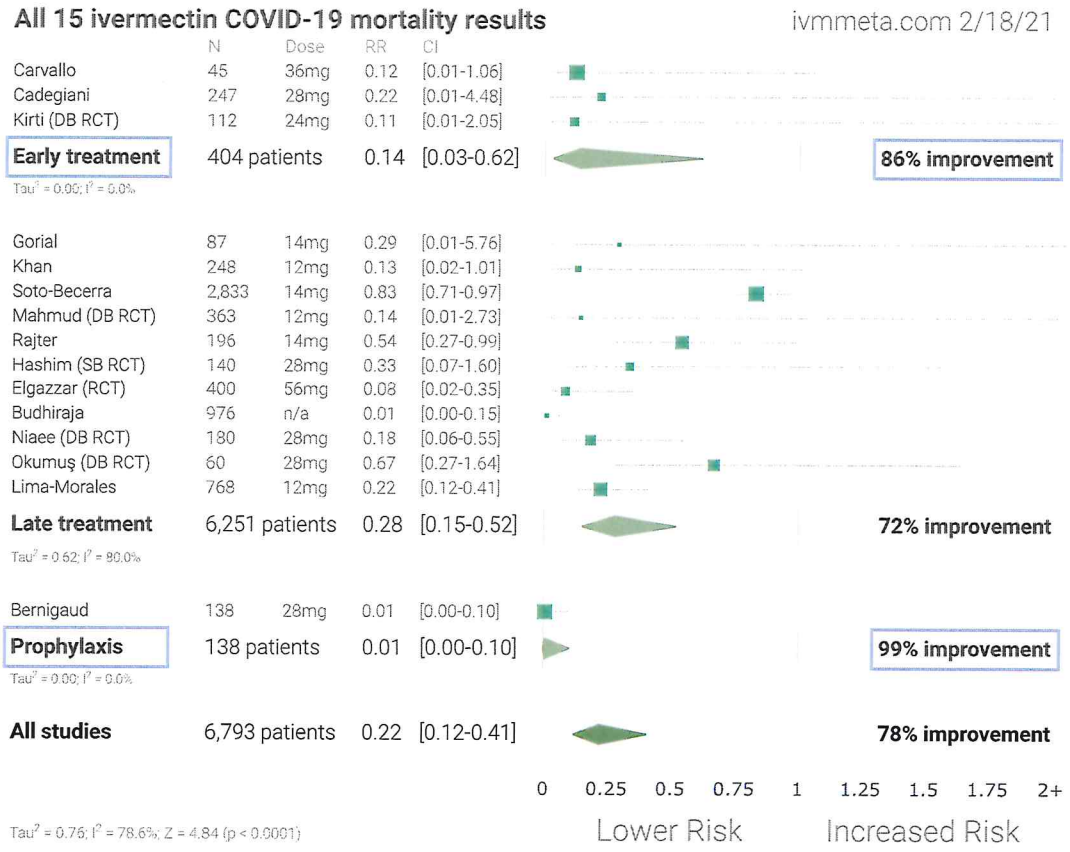

Figure 7. *Random effects meta-analysis for mortality results only.*

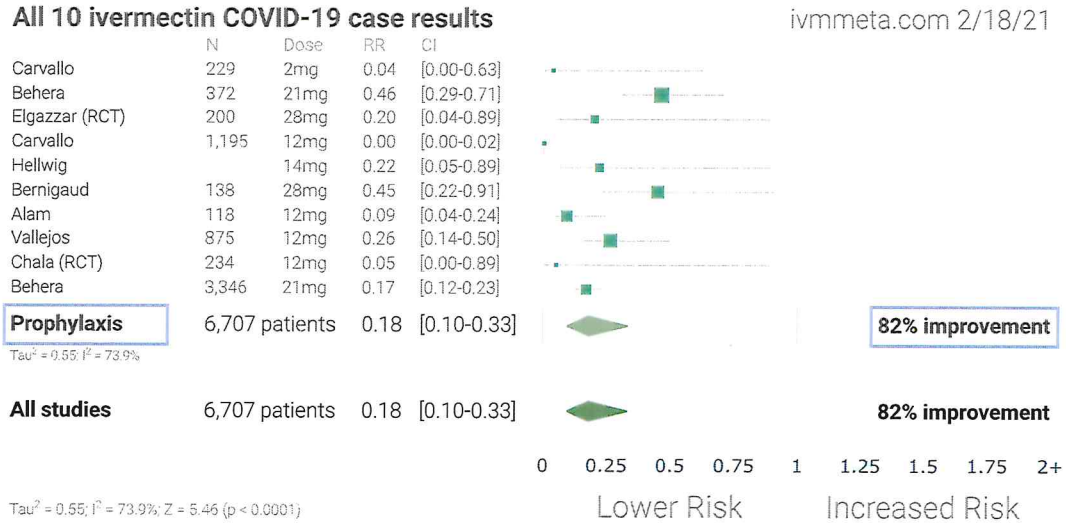

Figure 8. *Random effects meta-analysis for COVID-19 case results only.*

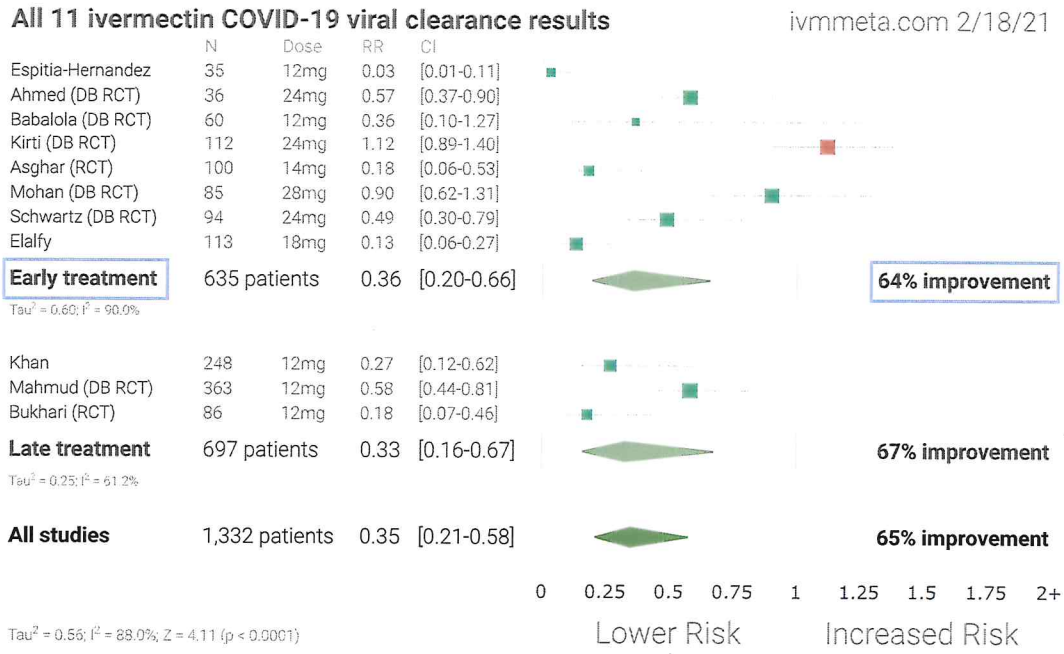

Figure 9. *Random effects meta-analysis for viral clearance results only.*

Randomized Controlled Trials (RCTs)

Results restricted to Randomized Controlled Trials (RCTs) are shown in Figure 10, 11, 12, and 13, and Table 2. RCT results are similar to non-RCT results. Evidence shows that non-RCT trials can also provide reliable results. ***[Concato]*** find that well-designed observational studies do not systematically overestimate the magnitude of the effects of treatment compared to RCTs. ***[Anglemyer]*** summarized reviews comparing RCTs to observational studies and found little evidence for significant differences in effect estimates. ***[Lee]*** shows that only 14% of the guidelines of the Infectious Diseases Society of America were based on RCTs. Evaluation of studies relies on an understanding of the study and potential biases. Limitations in an RCT can outweigh the benefits, for example excessive dosages, excessive treatment delays, or Internet survey bias could have a greater effect on results. Ethical issues may also prevent running RCTs for known effective treatments. For more on issues with RCTs see ***[Deaton, Nichol]***.

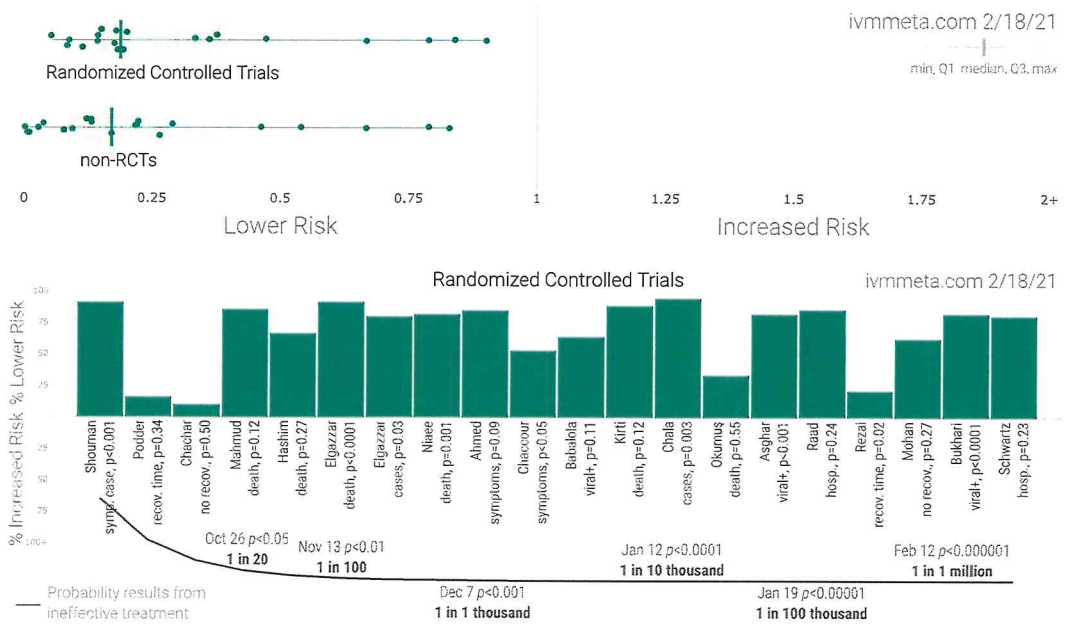

Figure 10. *Randomized Controlled Trials. The distribution of results for RCTs is similar to the distribution for all other studies.*

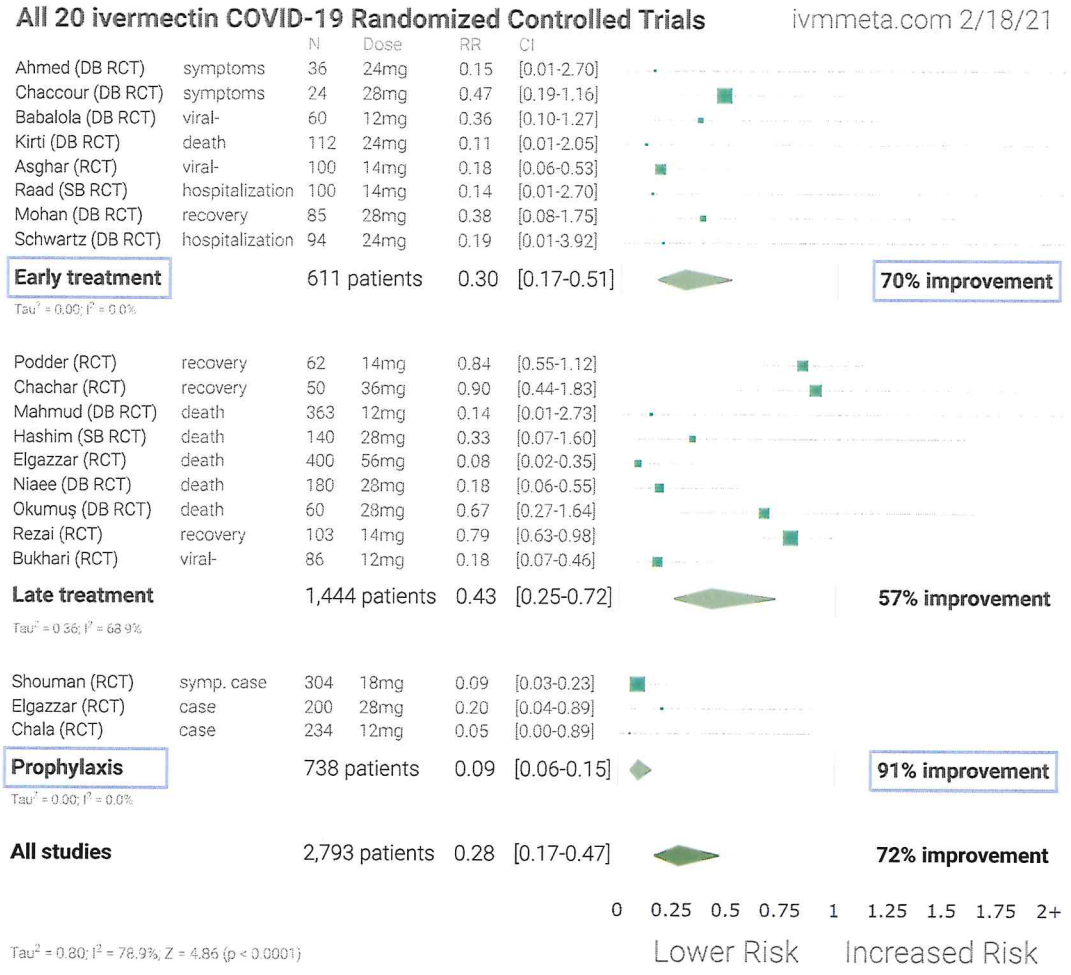

Figure 11. *Random effects meta-analysis for Randomized Controlled Trials only.*

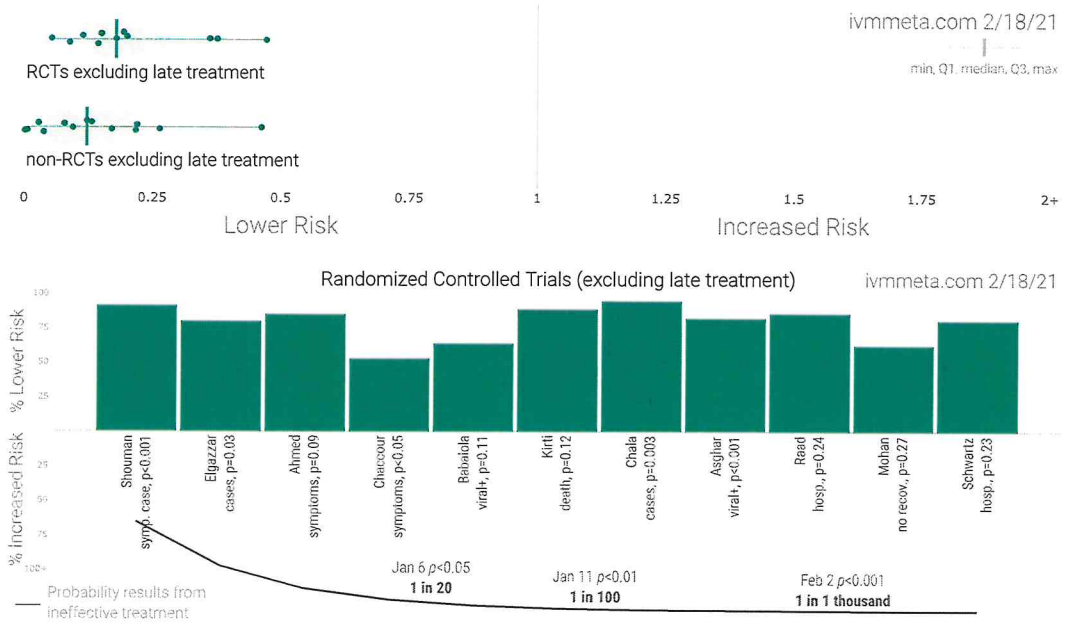

Figure 13. *RCTs excluding late treatment.*

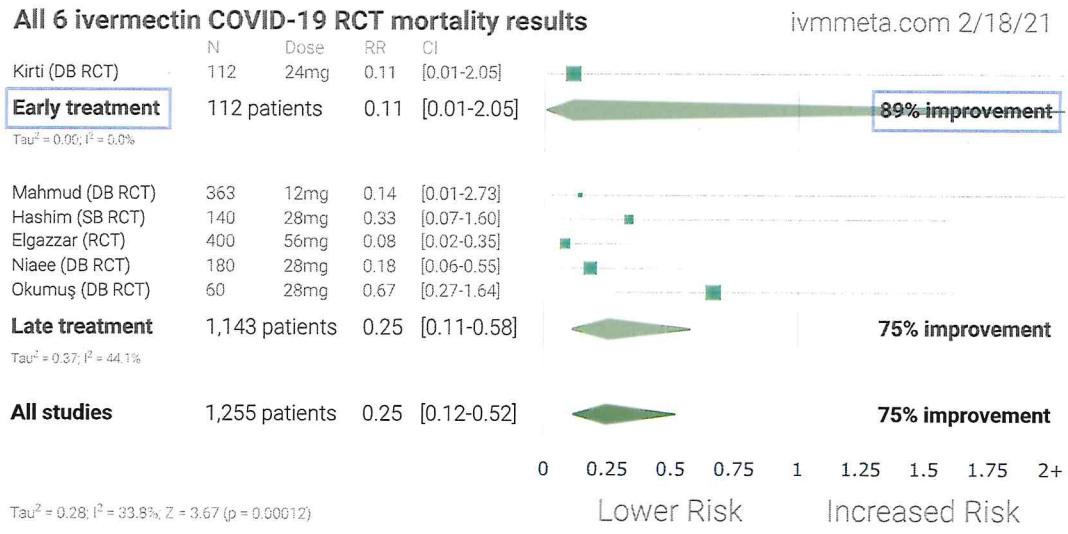

Figure 12. *Random effects meta-analysis for Randomized Controlled Trial mortality results only.*

Treatment time	Number of studies reporting positive results	Total number of studies	Percentage of studies reporting positive results	Probability of an equal or greater percentage of positive results from an ineffective treatment	Random effects meta-analysis results
Randomized Controlled Trials	20	20	100%	0.00000095 1 in 1 million	72% improvement RR 0.28 [0.17-0.47] p < 0.0001
Randomized Controlled Trials (excluding late treatment)	11	11	100%	0.00049 1 in 2 thousand	81% improvement RR 0.19 [0.11-0.31] p < 0.0001

Table 2. *Summary of RCT results.*

Exclusions

To avoid bias in the selection of studies, we include all studies in the main analysis. Here we show the results after excluding studies with critical issues likely to alter results, non-standard studies, and studies where very minimal detail is currently available.

[Soto-Becerra] is a database analysis covering anyone with ICD-10 COVID-19 codes, which includes asymptomatic PCR+ patients. Therefore many patients in the control group are likely asymptomatic with regards to SARS-CoV-2, but in the hospital for another reason. For those that had symptomatic COVID-19, there is also likely significant confounding by indication. KM curves show that the treatment groups were in more serious condition, with more than the total excess mortality at 30 days occurring on day 1. All treatments are worse than the control group at 30 days, while at the latest followup all treatments show lower mortality than control. The machine learning system used also appears over-parameterized and likely to result in significant overfitting and inaccurate results. There is also no real control group in this study - patients receiving the treatments after 48 hours were put in the control group. Authors also state that outcomes within 24 hours were excluded, however the KM curves show significant mortality at day 1 (only for the treatment groups). Note that this study provides both 30 day mortality and weighted KM curves up to day 43 for ivermectin, we use the day 43 results as per our protocol.

There is no paper currently available for *[Asghar]*. *[Vallejos]* reports prophylaxis results, however only very minimal details are currently available in a news report. We include these results for additional confirmation of the efficacy observed in other trials, however this study is excluded here. *[Hellwig]* provide an analysis of African countries and COVID-19 cases as a function of whether widespread prophylactic use of ivermectin is used for parasitic infections. Since this is a different kind of study to the typical trial, it is excluded here. *[Krolewiecki]* show a concentration dependent antiviral activity of ivermectin whereby the viral decay rate for patients with ivermectin >160ng/mL was 0.64 $\log_{10}$ copies/reaction/day versus 0.13 for control. However, they do not provide the results for the entire treatment group vs. control. Results for *[Raad, Rezai]* are available in *[Hill]*, however no paper is currently available.

Summarizing, the studies excluded are as follows, and the resulting forest plot is shown in Figure 14.

[Asghar], detail too minimal.

[Carvallo], control group formed from cases in the same hospital not in the study.

[Hellwig], not a typical trial, analysis of African countries that used or did not use ivermectin prophylaxis for parasitic infections.

[Raad], detail too minimal.

[Rezai], detail too minimal.

[Soto-Becerra], substantial unadjusted confounding by indication likely, includes PCR+ patients that may be asymptomatic for COVID-19 but in hospital for other reasons.

[Vallejos], detail too minimal.

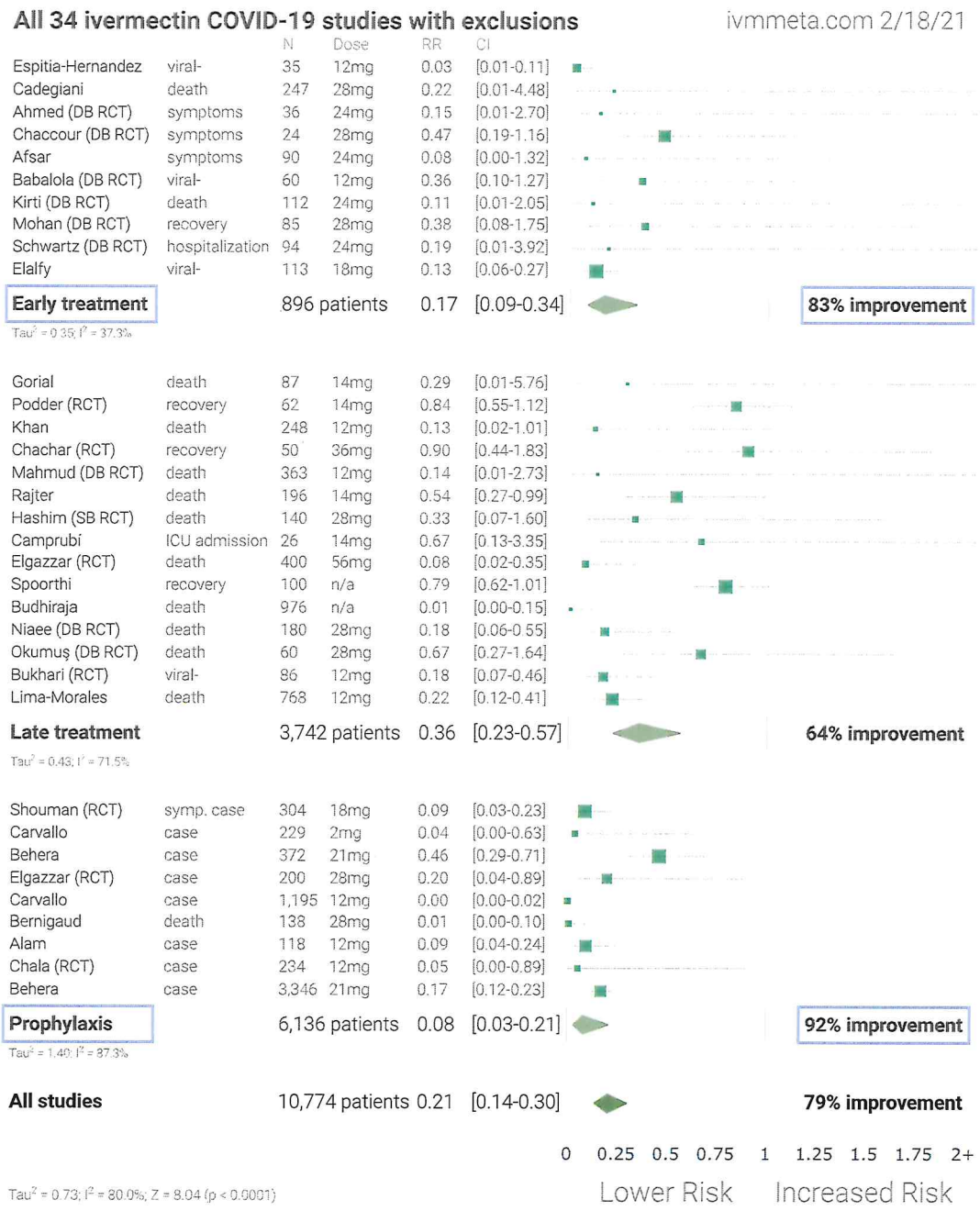

Figure 14. *Random effects meta-analysis excluding studies with significant issues.*

Discussion

Publishing is often biased towards positive results, which we would need to adjust for when analyzing the percentage of positive results. For ivermectin, there is currently not enough data to evaluate publication bias with high confidence. One method to evaluate bias is to compare prospective vs. retrospective studies. Prospective studies are likely to be published regardless of the result, while retrospective studies are more likely to exhibit bias. For example, researchers may perform preliminary analysis with minimal effort and the results may influence their decision to

continue. Retrospective studies also provide more opportunities for the specifics of data extraction and adjustments to influence results. Figure 15 shows a scatter plot of results for prospective and retrospective studies. The median effect size for prospective studies is 82% improvement, compared to 78% for retrospective studies, i.e., currently the prospective studies, which are less likely to exhibit a positive publication bias, show more positive results.

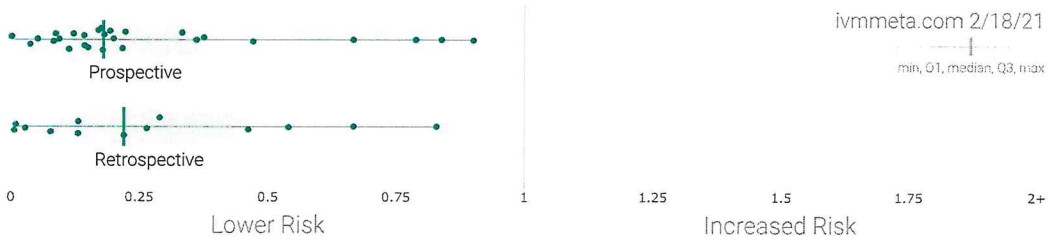

Figure 15. *Prospective vs. retrospective studies.*

Typical meta analyses involve subjective selection criteria, effect extraction rules, and study bias evaluation, which can be used to bias results towards a specific outcome. In order to avoid bias we include all studies and use a pre-specified method to extract results from all studies. Every day that the approval of ivermectin is delayed results in thousands of deaths, so it is important to consider all available data. We note that the positive results to date are very consistent and are relatively insensitive to potential selection criteria, effect extraction rules, and/or bias evaluation.

Studies vary significantly in terms of treatment delay, treatment regimen, patients characteristics, and (for the pooled effects analysis) outcomes, as reflected in the high degree of heterogeneity. However the results consistently show a positive effect of treatment, and with the exception of some late treatment studies, the effect size is large.

Additional meta analyses confirming the effectiveness of ivermectin can be found in ***[Hill, Kory, Lawrie]***. ***[Kory]*** also review epidemiological data and provide suggested treatment regimens.

Conclusion

Ivermectin is an effective treatment for COVID-19. The probability that an ineffective treatment generated results as positive as the 41 studies to date is estimated to be 1 in 2 trillion (p = 0.00000000000045). As expected for an effective treatment, early treatment is more successful, with an estimated reduction of 83% in the effect measured using a random effects meta-analysis, RR 0.17 [0.11-0.28].

Revisions

This paper is data driven, all graphs and numbers are dynamically generated. We will update the paper as new studies are released or with any corrections. Please submit updates and corrections at https://ivmmeta.com/.

12/2: We added ***[Ahmed]***.

12/7: We added *[Chaccour]*.

12/11: We added *[Soto-Becerra]*.

12/16: We added *[Afsar]*.

12/17: We added *[Alam]*.

12/26: We added *[Carvallo (C), Vallejos]*.

12/27: We added the total number of authors and patients.

12/29: We added meta analysis excluding late treatment.

12/31: We added additional details about the studies in the appendix.

1/2: We added dosage information and we added the number of patients to the forest plots.

1/5: We added direct links to the study details in the forest plots.

1/6: We added *[Babalola]*.

1/7: We added direct links to the study details in the chronological plots.

1/9: We added *[Kirti]*. Due to the much larger size of the control group in *[Bernigaud]*, we limited the size of the control group to be the same as the treatment group for calculation of the number of patients.

1/10: We put all prophylaxis studies in a single group.

1/11: We added *[Chala]*.

1/12: We added *[Okumuş]*.

1/15: We added the effect measured for each study in the forest plots.

1/16: We moved the analysis with exclusions to the main text, and added additional commentary.

1/17: We added *[Asghar]*.

1/19: We added *[Raad, Rezai]*. *[Chaccour]* was updated to the journal version of the paper.

1/25: We updated *[Vallejos]* with the recently released results.

1/26: We updated *[Shouman]* with the journal version of the article.

2/2: We added *[Mohan]*.

2/5: We added *[Bukhari]*.

2/10: We added *[Lima-Morales]*.

2/11: We added more details on the analysis of prospective vs. retrospective studies.

2/12: We added ***[Schwartz]***.

2/14: We added analysis restricted to COVID-19 case outcomes, and we added additional results in the abstract.

2/15: We added ***[Behera]***.

2/16: We updated ***[Behera (B)]*** to the journal version of the paper.

2/17: We added ***[Elalfy]***, and we added analysis restricted to viral clearance outcomes, and mortality results restricted to RCTs.

2/18: We updated ***[Babalola]*** to the journal version of the paper.

Appendix 1. Methods and Study Results

We performed ongoing searches of PubMed, medRxiv, ClinicalTrials.gov, The Cochrane Library, Google Scholar, Collabovid, Research Square, ScienceDirect, Oxford University Press, the reference lists of other studies and meta-analyses, and submissions to the site c19ivermectin.com, which regularly receives submissions of studies upon publication. Search terms were ivermectin and COVID-19 or SARS-CoV-2, or simply ivermectin. Automated searches are performed every hour with notifications of new matches. All studies regarding the use of ivermectin for COVID-19 that report an effect compared to a control group are included in the main analysis. This is a living analysis and is updated regularly.

We extracted effect sizes and associated data from all studies. If studies report multiple kinds of effects then the most serious outcome is used in calculations for that study. For example, if effects for mortality and cases are both reported, the effect for mortality is used, this may be different to the effect that a study focused on. If symptomatic results are reported at multiple times, we used the latest time, for example if mortality results are provided at 14 days and 28 days, the results at 28 days are used. Mortality alone is preferred over combined outcomes. Outcomes with zero events in both arms were not used. Clinical outcome is considered more important than PCR testing status. For PCR results reported at multiple times, where a majority of patients recover in both groups, preference is given to results mid-recovery (after most or all patients have recovered there is no room for an effective treatment to do better). When results provide an odds ratio, we computed the relative risk when possible, or converted to a relative risk according to ***[Zhang]***. Reported confidence intervals and *p*-values were used when available, using adjusted values when provided. If multiple types of adjustments are reported including propensity score matching (PSM), the PSM results are used. When needed, conversion between reported *p*-values and confidence intervals followed ***[Altman, Altman (B)]***, and Fisher's exact test was used to calculate *p*-values for event data. If continuity correction for zero values is required, we use the reciprocal of the opposite arm with the sum of the correction factors equal to 1 ***[Sweeting]***. Results are all expressed with RR < 1.0 suggesting effectiveness. Most results are the relative risk of something negative. If studies report relative times, results are expressed as the ratio of the time for the ivermectin group versus the time for the control group. Calculations are done in Python (3.9.1) with scipy (1.5.4), pythonmeta (1.11), numpy (1.19.4), statsmodels (0.12.1), and plotly (4.14.1).

The forest plots are computed using PythonMeta *[Deng]* with the DerSimonian and Laird random effects model (the fixed effect assumption is not plausible in this case). The forest plots show simplified dosages for comparison, these are the total dose in the first two days for treatment, and the monthly dose for prophylaxis, for a 70kg person. For full dosage details see below.

We received no funding, this research is done in our spare time. We have no affiliations with any pharmaceutical companies or political parties.

We have classified studies as early treatment if most patients are not already at a severe stage at the time of treatment, and treatment started within 5 days after the onset of symptoms, although a shorter time may be preferable. Antivirals are typically only considered effective when used within a shorter timeframe, for example 0-36 or 0-48 hours for oseltamivir, with longer delays not being effective *[McLean, Treanor]*.

Due to the much larger size of the control group in *[Bernigaud]*, we limit the size of the control group to be the same as the treatment group for calculation of the number of patients.

A summary of study results is below. Please submit updates and corrections at https://ivmmeta.com/.

Early treatment

Effect extraction follows pre-specified rules as detailed above and gives priority to more serious outcomes. Only the first (most serious) outcome is used in calculations, which may differ from the effect a paper focuses on.

[Afsar], 12/15/2020, retrospective, Pakistan, South Asia, preprint, 6 authors, dosage 12mg days 1-6.	**risk of fever at day 14, 92.2% lower, RR 0.08, p = 0.04**, treatment 0 of 37 (0.0%), control 7 of 53 (13.2%).
[Ahmed], 12/2/2020, Double Blind Randomized Controlled Trial, Bangladesh, South Asia, peer-reviewed, 15 authors, dosage 12mg days 1-5, ivermectin + doxycycline group took only a single dose of ivermectin.	**risk of unresolved symptoms, 85.0% lower, RR 0.15, p = 0.09**, treatment 0 of 17 (0.0%), control 3 of 19 (15.8%), day 7 fever ivermectin.
	risk of unresolved symptoms, 62.7% lower, RR 0.37, p = 0.35, treatment 1 of 17 (5.9%), control 3 of 19 (15.8%), day 7 fever ivermectin + doxycycline.
	risk of no virological cure, 42.5% lower, RR 0.58, p = 0.01, treatment 11 of 22 (50.0%), control 20 of 23 (87.0%), day 7 ivermectin.
	risk of no virological cure, 20.0% lower, RR 0.80, p = 0.28, treatment 16 of 23 (69.6%), control 20 of 23 (87.0%), day 7 ivermectin + doxycycline.
	risk of no virological cure, 62.7% lower, RR 0.37, p = 0.02, treatment 5 of 22 (22.7%), control 14 of 23 (60.9%), day 14 ivermectin.
	risk of no virological cure, 35.7% lower, RR 0.64, p = 0.24, treatment 9 of 23 (39.1%), control 14 of 23

	(60.9%), day 14 ivermectin + doxycycline.
	time to viral-, 23.6% lower, relative time 0.76, p = 0.02, ivermectin.
	time to viral-, 9.4% lower, relative time 0.91, p = 0.27, ivermectin + doxycycline.
[Asghar], 1/16/2021, Randomized Controlled Trial, Pakistan, South Asia, preprint, 1 author, dosage 200µg/kg days 1, 8.	**risk of no virological cure, 82.1% lower, RR 0.18, p < 0.001**, treatment 50, control 50, day 7.
[Babalola], 1/6/2021, Double Blind Randomized Controlled Trial, Nigeria, Africa, peer-reviewed, baseline oxygen requirements 8.3%, 10 authors, dosage 12mg or 6mg q84h for two weeks.	**adjusted risk of viral+ at day 5, 63.9% lower, RR 0.36, p = 0.11**, treatment 40, control 20, adjusted per study.
	risk of no virological cure, 58.0% lower, RR 0.42, p = 0.01, treatment 20, control 20, 12mg - Cox proportional hazard model.
	risk of no virological cure, 40.5% lower, RR 0.60, p = 0.12, treatment 20, control 20, 6mg - Cox proportional hazard model.
	time to viral-, 49.2% lower, relative time 0.51, treatment 20, control 20, 12mg.
	time to viral-, 34.4% lower, relative time 0.66, treatment 20, control 20, 6mg.
[Cadegiani], 11/4/2020, prospective, Brazil, South America, preprint, 4 authors, dosage 200µg/kg days 1-3.	**risk of death, 78.3% lower, RR 0.22, p = 0.50**, treatment 0 of 110 (0.0%), control 2 of 137 (1.5%), control group 1.
	risk of ventilation, 94.2% lower, RR 0.06, p = 0.005, treatment 0 of 110 (0.0%), control 9 of 137 (6.6%), control group 1.
	risk of hospitalization, 98.0% lower, RR 0.02, p < 0.001, treatment 0 of 110 (0.0%), control 27 of 137 (19.7%), control group 1.
[Carvallo], 9/15/2020, prospective, Argentina, South America, preprint, 3 authors, dosage 36mg days 1, 8, dose varied depending on patient condition - mild 24mg, moderate 36mg, severe 48mg.	**risk of death for hospitalized cases in study vs. cases in the same hospital not in the study, 87.9% lower, RR 0.12, p = 0.05**, treatment 1 of 33 (3.0%), control 3 of 12 (25.0%), the only treatment death was a patient already in the ICU before treatment.
[Chaccour], 12/7/2020, Double Blind Randomized Controlled Trial, Spain, Europe, peer-reviewed, 23 authors, dosage 400µg/kg single dose.	**risk of unresolved symptoms, 52.9% lower, RR 0.47, p < 0.05**, treatment 12, control 12, relative probability of symptoms at day 28.
	viral load, 94.6% lower, relative load 0.05, treatment 12, control 12, day 7 mid-recovery.

[Elalfy], 2/16/2021, retrospective, Egypt, Middle East, peer-reviewed, 15 authors, dosage 18mg days 1, 4, 7, 10, 13, <90kg 18mg, 90-120kg 24mg, >120kg 30mg.	**risk of no virological cure, 86.9% lower, RR 0.13, p < 0.001**, treatment 7 of 62 (11.3%), control 44 of 51 (86.3%), day 15.
	risk of no virological cure, 58.1% lower, RR 0.42, p < 0.001, treatment 26 of 62 (41.9%), control 51 of 51 (100.0%), day 7.
[Espitia-Hernandez], 8/15/2020, retrospective, Mexico, North America, peer-reviewed, 5 authors, dosage 6mg days 1-2, 8-9.	**risk of viral+ at day 10, 97.2% lower, RR 0.03, p < 0.001**, treatment 0 of 28 (0.0%), control 7 of 7 (100.0%).
[Kirti], 1/9/2021, Double Blind Randomized Controlled Trial, India, South Asia, preprint, 11 authors, dosage 12mg days 1, 2.	**risk of death, 88.7% lower, RR 0.11, p = 0.12**, treatment 0 of 55 (0.0%), control 4 of 57 (7.0%).
	risk of ventilation, 79.3% lower, RR 0.21, p = 0.09, treatment 1 of 55 (1.8%), control 5 of 57 (8.8%).
	risk of ICU admission, 13.6% lower, RR 0.86, p = 0.80, treatment 5 of 55 (9.1%), control 6 of 57 (10.5%).
	risk of no virological cure, 11.6% higher, RR 1.12, p = 0.35, treatment 42 of 55 (76.4%), control 39 of 57 (68.4%).
[Mohan], 2/2/2021, Double Blind Randomized Controlled Trial, India, South Asia, preprint, 27 authors, dosage 400µg/kg single dose, 200µg/kg also tested.	**risk of no discharge at day 14, 62.5% lower, RR 0.38, p = 0.27**, treatment 2 of 40 (5.0%), control 6 of 45 (13.3%), ivermectin 24mg.
	risk of no discharge at day 14, 43.8% lower, RR 0.56, p = 0.49, treatment 3 of 40 (7.5%), control 6 of 45 (13.3%), ivermectin 12mg.
	risk of no virological cure, 10.3% lower, RR 0.90, p = 0.65, treatment 20 of 36 (55.6%), control 26 of 42 (61.9%), ivermectin 24mg, day 7.
	risk of no virological cure, 3.2% higher, RR 1.03, p = 1.00, treatment 23 of 36 (63.9%), control 26 of 42 (61.9%), ivermectin 12mg, day 7.
	risk of no virological cure, 23.8% lower, RR 0.76, p = 0.18, treatment 21 of 40 (52.5%), control 31 of 45 (68.9%), ivermectin 24mg, day 5.
	risk of no virological cure, 5.6% lower, RR 0.94, p = 0.82, treatment 26 of 40 (65.0%), control 31 of 45 (68.9%), ivermectin 12mg, day 5.
[Raad], 1/16/2021, Single Blind Randomized Controlled Trial, Lebanon, Middle East, preprint, 1 author, dosage 200µg/kg single dose.	**risk of hospitalization, 85.7% lower, RR 0.14, p = 0.24**, treatment 0 of 50 (0.0%), control 3 of 50 (6.0%).

	risk of viral load, 59.0% lower, RR 0.41, p = 0.01, treatment 50, control 50, percentage relative improvement in Ct value with treatment at day 3.
[Schwartz], 2/12/2021, Double Blind Randomized Controlled Trial, Israel, Middle East, preprint, 1 author, dosage 12mg days 1-3, 15mg for patients >= 70kg.	**risk of hospitalization, 80.7% lower, RR 0.19, p = 0.23**, treatment 0 of 49 (0.0%), control 2 of 45 (4.4%).
	risk of no virological cure, 51.4% lower, RR 0.49, p = 0.01, treatment 16 of 49 (32.7%), control 25 of 45 (55.6%), adjusted per study, odds ratio converted to relative risk, multivariable logistic regression, day 6, Ct>30.
	risk of no virological cure, 54.1% lower, RR 0.46, p = 0.02, treatment 9 of 49 (18.4%), control 18 of 45 (40.0%), day 10, Ct>30.
	risk of no virological cure, 54.1% lower, RR 0.46, p = 0.02, treatment 10 of 49 (20.4%), control 20 of 45 (44.4%), day 8, Ct>30.
	risk of no virological cure, 41.2% lower, RR 0.59, p = 0.04, treatment 16 of 49 (32.7%), control 25 of 45 (55.6%), day 6, Ct>30.
	risk of no virological cure, 37.9% lower, RR 0.62, p = 0.09, treatment 11 of 26 (42.3%), control 15 of 22 (68.2%), day 4, Ct>30.

Late treatment

Effect extraction follows pre-specified rules as detailed above and gives priority to more serious outcomes. Only the first (most serious) outcome is used in calculations, which may differ from the effect a paper focuses on.

[Budhiraja], 11/18/2020, retrospective, India, South Asia, preprint, 12 authors, dosage not specified.	**risk of death, 99.1% lower, RR 0.009, p = 0.04**, treatment 0 of 34 (0.0%), control 103 of 942 (10.9%).
[Bukhari], 2/5/2021, Randomized Controlled Trial, Pakistan, Middle East, preprint, 10 authors, dosage 12mg single dose.	**risk of no virological cure, 82.4% lower, RR 0.18, p < 0.001**, treatment 4 of 41 (9.8%), control 25 of 45 (55.6%), day 7.
	risk of no virological cure, 38.7% lower, RR 0.61, p < 0.001, treatment 24 of 41 (58.5%), control 43 of 45 (95.6%), day 3.
[Camprubí], 11/11/2020, retrospective, Spain, Europe, peer-reviewed, 9 authors, dosage 200µg/kg single dose.	**risk of ICU admission, 33.3% lower, RR 0.67, p = 1.00**, treatment 2 of 13 (15.4%), control 3 of 13 (23.1%), ICU at day 8.
	risk of no improvement at day 8, 33.3% higher, RR 1.33, p = 1.00, treatment 4 of 13 (30.8%), control 3

	of 13 (23.1%).
[Chachar], 9/30/2020, Randomized Controlled Trial, India, South Asia, peer-reviewed, 6 authors, dosage 36mg, 12mg stat, 12mg after 12 hours, 12mg after 24 hours.	**risk of no recovery at day 7, 10.0% lower, RR 0.90, $p = 0.50$**, treatment 9 of 25 (36.0%), control 10 of 25 (40.0%).
[Elgazzar], 11/13/2020, Randomized Controlled Trial, Egypt, Africa, preprint, 6 authors, dosage 400µg/kg days 1-4.	**risk of death, 91.7% lower, RR 0.08, $p < 0.001$**, treatment 2 of 200 (1.0%), control 24 of 200 (12.0%).
	risk of death, 88.9% lower, RR 0.11, $p = 0.12$, treatment 0 of 100 (0.0%), control 4 of 100 (4.0%), mild/moderate COVID-19.
	risk of death, 90.0% lower, RR 0.10, $p < 0.001$, treatment 2 of 100 (2.0%), control 20 of 100 (20.0%), severe COVID-19.
[Gorial], 7/8/2020, retrospective, Iraq, Middle East, preprint, 9 authors, dosage 200µg/kg single dose.	**risk of death, 71.0% lower, RR 0.29, $p = 1.00$**, treatment 0 of 16 (0.0%), control 2 of 71 (2.8%).
	hospitalization time, 42.0% lower, relative time 0.58, $p < 0.001$, treatment 16, control 71.
[Hashim], 10/26/2020, Single Blind Randomized Controlled Trial, Iraq, Middle East, preprint, 6 authors, dosage 200µg/kg days 1-2, some patients received a third dose on day 8.	**risk of death, 66.7% lower, RR 0.33, $p = 0.27$**, treatment 2 of 70 (2.9%), control 6 of 70 (8.6%), all patients.
	risk of death, 91.7% lower, RR 0.08, $p = 0.03$, treatment 0 of 59 (0.0%), control 6 of 70 (8.6%), excluding critical patients.
[Khan], 9/24/2020, retrospective, Bangladesh, South Asia, preprint, median age 35.0, 8 authors, dosage 12mg single dose.	**risk of death, 87.0% lower, RR 0.13, $p < 0.05$**, treatment 1 of 115 (0.9%), control 9 of 133 (6.8%).
	time to viral-, 73.3% lower, relative time 0.27, $p < 0.001$, treatment 115, control 133.
[Lima-Morales], 2/10/2021, prospective, Mexico, North America, peer-reviewed, 9 authors, dosage 12mg single dose.	**risk of death, 77.7% lower, RR 0.22, $p < 0.001$**, treatment 15 of 481 (3.1%), control 52 of 287 (18.1%), adjusted per study, odds ratio converted to relative risk, multivariate.
	risk of hospitalization, 67.4% lower, RR 0.33, $p < 0.001$, treatment 44 of 481 (9.1%), control 89 of 287 (31.0%), adjusted per study, odds ratio converted to relative risk, multivariate.
	risk of no recovery, 58.6% lower, RR 0.41, $p < 0.001$, treatment 75 of 481 (15.6%), control 118 of 287 (41.1%), adjusted per study, odds ratio converted to relative risk, recovery at day 14 after symptoms, multivariate.

[Mahmud], 10/9/2020, Double Blind Randomized Controlled Trial, Bangladesh, South Asia, preprint, 1 author, dosage 12mg single dose.	**risk of death, 85.8% lower, RR 0.14, $p = 0.12$,** treatment 0 of 183 (0.0%), control 3 of 180 (1.7%).
	risk of no recovery, 49.0% lower, RR 0.51, $p < 0.004$, treatment 42 of 183 (23.0%), control 67 of 180 (37.2%), adjusted per study.
	risk of disease progression, 55.0% lower, RR 0.45, $p < 0.01$, treatment 16 of 183 (8.7%), control 32 of 180 (17.8%), adjusted per study.
	risk of no virological cure, 42.0% lower, RR 0.58, $p < 0.001$, treatment 14 of 183 (7.7%), control 36 of 180 (20.0%), adjusted per study.
[Niaee], 11/24/2020, Double Blind Randomized Controlled Trial, Iran, Middle East, preprint, mean age 56.0, 14 authors, dosage 400µg/kg single dose, dose varies in different groups.	**risk of death, 81.8% lower, RR 0.18, $p = 0.001$,** treatment 4 of 120 (3.3%), control 11 of 60 (18.3%), All IVM vs. all control.
	risk of death, 94.3% lower, RR 0.06, $p = 0.01$, treatment 0 of 30 (0.0%), control 11 of 60 (18.3%), IVM single dose 200mcg/kg vs. all control.
	risk of death, 45.5% lower, RR 0.55, $p = 0.37$, treatment 3 of 30 (10.0%), control 11 of 60 (18.3%), IVM three dose 200mcg/kg vs. all control.
	risk of death, 94.3% lower, RR 0.06, $p = 0.01$, treatment 0 of 30 (0.0%), control 11 of 60 (18.3%), IVM single dose 400mcg/kg vs. all control.
	risk of death, 81.8% lower, RR 0.18, $p = 0.06$, treatment 1 of 30 (3.3%), control 11 of 60 (18.3%), IVM three dose 400/200/200mcg/kg vs. all control.
[Okumuş], 1/12/2021, Double Blind Randomized Controlled Trial, Turkey, Middle East, preprint, 1 author, dosage 200µg/kg days 1-5, 36-50kg - 9mg, 51-65kg - 12mg, 66-79kg - 15mg, >80kg 200µg/kg.	**risk of death, 33.3% lower, RR 0.67, $p = 0.55$,** treatment 6 of 30 (20.0%), control 9 of 30 (30.0%).
	risk of no improvement at day 5, 15.8% lower, RR 0.84, $p = 0.60$, treatment 16 of 30 (53.3%), control 19 of 30 (63.3%).
[Podder], 9/3/2020, Randomized Controlled Trial, Bangladesh, South Asia, peer-reviewed, 4 authors, dosage 200µg/kg single dose.	**recovery time from enrollment, 16.1% lower, relative time 0.84, $p = 0.34$,** treatment 32, control 30.
[Rajter], 10/13/2020, retrospective, USA, North America, peer-reviewed, 6 authors, dosage 200µg/kg single dose.	**risk of death, 46.0% lower, RR 0.54, $p = 0.04$,** treatment 13 of 98 (13.3%), control 24 of 98 (24.5%), adjusted per study, odds ratio converted to relative risk, PSM.
	risk of death, 66.9% lower, RR 0.33, $p = 0.03$, treatment 26 of 173 (15.0%), control 27 of 107 (25.2%), adjusted per study, odds ratio converted

	to relative risk, multivariate.
[Rezai], 1/19/2021, Randomized Controlled Trial, Iran, Middle East, preprint, 1 author, dosage 200µg/kg single dose.	**recovery time, 21.2% lower, relative time 0.79, p = 0.02**, treatment 51, control 52.
	hospitalization time, 17.9% lower, relative time 0.82, p = 0.01, treatment 51, control 52.
[Soto-Becerra], 10/8/2020, retrospective, database analysis, Peru, South America, preprint, median age 59.4, 4 authors, dosage 200µg/kg single dose.	**risk of death, 17.1% lower, RR 0.83, p = 0.01**, treatment 92 of 203 (45.3%), control 1438 of 2630 (54.7%), IVM vs. control day 43 (last day available) weighted KM from figure 3, per the pre-specified rules, the last available day mortality results have priority.
	risk of death, 39.0% higher, RR 1.39, p = 0.16, treatment 47 of 203 (23.2%), control 401 of 2630 (15.2%), adjusted per study, day 30.
[Spoorthi], 11/14/2020, prospective, India, South Asia, peer-reviewed, 2 authors, dosage not specified.	**recovery time, 21.1% lower, relative time 0.79, p = 0.03**, treatment 50, control 50.
	hospitalization time, 15.5% lower, relative time 0.84, p = 0.01, treatment 50, control 50.

Prophylaxis

Effect extraction follows pre-specified rules as detailed above and gives priority to more serious outcomes. Only the first (most serious) outcome is used in calculations, which may differ from the effect a paper focuses on.

[Alam], 12/15/2020, prospective, Bangladesh, South Asia, peer-reviewed, 13 authors, dosage 12mg monthly.	**risk of COVID-19 case, 90.6% lower, RR 0.09, p < 0.001**, treatment 4 of 58 (6.9%), control 44 of 60 (73.3%).
[Behera], 2/15/2021, prospective, India, South Asia, preprint, 13 authors, dosage 300µg/kg days 1, 4.	**risk of COVID-19 case, 83.0% lower, RR 0.17, p < 0.001**, treatment 2199, control 1147, two doses.
	risk of COVID-19 case, 4.0% higher, RR 1.04, p = 0.85, treatment 186, control 1147, patients only receiving the first dose.
[Behera (B)], 11/3/2020, retrospective, India, South Asia, peer-reviewed, 13 authors, dosage 300µg/kg days 1, 4.	**risk of COVID-19 case, 53.8% lower, RR 0.46, p < 0.001**, treatment 41 of 117 (35.0%), control 145 of 255 (56.9%), adjusted per study, odds ratio converted to relative risk, model 2 2+ doses conditional logistic regression.
	risk of COVID-19 case, 44.5% lower, RR 0.56, p < 0.001, treatment 41 of 117 (35.0%), control 145 of 255 (56.9%), odds ratio converted to relative risk, matched pair analysis.
[Bernigaud], 11/28/2020, retrospective,	**risk of death, 99.4% lower, RR 0.006, p = 0.08**,

France, Europe, peer-reviewed, 12 authors, dosage 200µg/kg days 1, 8, 15, 400µg/kg days 1, 8, 15, two different dosages.	treatment 0 of 69 (0.0%), control 150 of 3062 (4.9%).
	risk of COVID-19 case, 55.1% lower, RR 0.45, p = 0.01, treatment 7 of 69 (10.1%), control 692 of 3062 (22.6%).
[Carvallo (B)], 11/17/2020, prospective, Argentina, South America, peer-reviewed, 4 authors, dosage 12mg weekly.	**risk of COVID-19 case, 99.9% lower, RR 0.001, p < 0.001**, treatment 0 of 788 (0.0%), control 237 of 407 (58.2%).
[Carvallo (C)], 10/19/2020, prospective, Argentina, South America, preprint, 1 author, dosage 1mg days 1-14.	**risk of COVID-19 case, 96.3% lower, RR 0.04, p < 0.001**, treatment 0 of 131 (0.0%), control 11 of 98 (11.2%).
[Chala], 1/11/2021, Randomized Controlled Trial, Argentina, South America, preprint, 1 author, dosage 12mg weekly.	**risk of COVID-19 case, 94.7% lower, RR 0.05, p = 0.003**, treatment 0 of 117 (0.0%), control 9 of 117 (7.7%), moderate/severe COVID-19.
	risk of COVID-19 case, 84.0% lower, RR 0.16, p < 0.001, treatment 4 of 117 (3.4%), control 25 of 117 (21.4%), all cases.
[Elgazzar (B)], 11/13/2020, Randomized Controlled Trial, Egypt, Africa, preprint, 6 authors, dosage 400µg/kg weekly.	**risk of COVID-19 case, 80.0% lower, RR 0.20, p = 0.03**, treatment 2 of 100 (2.0%), control 10 of 100 (10.0%).
[Hellwig], 11/28/2020, retrospective, multiple countries, Africa, peer-reviewed, 2 authors, dosage 200µg/kg, dose varied, typically 150-200µg/kg.	**risk of COVID-19 case, 78.0% lower, RR 0.22, p < 0.02**, African countries.
	risk of COVID-19 case, 80.0% lower, RR 0.20, p < 0.001, worldwide.
[Shouman], 8/28/2020, Randomized Controlled Trial, Egypt, Africa, peer-reviewed, 8 authors, dosage 18mg days 1, 3, dose varies depending on weight - 40-60kg: 15mg, 60-80kg: 18mg, >80kg: 24mg.	**risk of symptomatic case, 91.3% lower, RR 0.09, p < 0.001**, treatment 15 of 203 (7.4%), control 59 of 101 (58.4%), adjusted per study, multivariate.
	risk of COVID-19 severe case, 92.9% lower, RR 0.07, p = 0.002, treatment 1 of 203 (0.5%), control 7 of 101 (6.9%), unadjusted.
[Vallejos], 12/20/2020, retrospective, Argentina, South America, preprint, 1 author, dosage 12mg weekly.	**risk of COVID-19 case, 73.6% lower, RR 0.26, p < 0.001**, treatment 11 of 389 (2.8%), control 52 of 486 (10.7%).

References

1. **Afsar** et al., SSRN, *Ivermectin Use Associated with Reduced Duration of COVID-19 Febrile Illness in a Community Setting*, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3734478.

2. **Ahmed** et al., International Journal of Infectious Diseases, doi:10.1016/j.ijid.2020.11.191, *A five day course of ivermectin for the treatment of COVID-19 may reduce the duration of illness*, https://www.sciencedirect.com/science/article/pii/S1201971220325066.

3. **Alam** et al., European Journal ofMedical and Health Sciences, doi:10.24018/ejmed.2020.2.6.599, *Ivermectin as Pre-exposure Prophylaxis for COVID-19 among Healthcare Providers in a Selected Tertiary Hospital in Dhaka – An Observational Study*, https://ejmed.org/index.php/ejmed/article/view/599.

4. **Altman**, D., BMJ, doi:10.1136/bmj.d2304, *How to obtain the P value from a confidence interval*, https://www.bmj.com/content/343/bmj.d2304.

5. **Altman (B)** et al., BMJ, doi:10.1136/bmj.d2090, *How to obtain the confidence interval from a P value*, https://www.bmj.com/content/343/bmj.d2090.

6. **Anglemyer** et al., Cochrane Database of Systematic Reviews 2014, Issue 4, doi:10.1002/14651858.MR000034.pub2, *Healthcare outcomes assessed with observational study designs compared with those assessed in randomized trials*, https://www.cochranelibrary.com/cd..0.1002/14651858.MR000034.pub2/full.

7. **Asghar** et al., NCT04392713, *Efficacy of Ivermectin in COVID-19*, https://clinicaltrials.gov/ct2/show/NCT04392713.

8. **Babalola** et al., QJM: An International Journal of Medicine, doi:10.1093/qjmed/hcab035 (preprint 1/6), *Ivermectin shows clinical benefits in mild to moderate COVID19: A randomised controlled double-blind, dose-response study in Lagos*, https://academic.oup.com/qjmed/adv../doi/10.1093/qjmed/hcab035/6143037.

9. **Behera** et al., Research Square, doi:10.21203/rs.3.rs-208785/v1, *Prophylactic role of ivermectin in SARS-CoV-2 infection among healthcare workers*, https://www.researchsquare.com/article/rs-208785/v1.

10. **Behera (B)** et al., PLOS ONE, doi:10.1371/journal.pone.0247163 (preprint 11/3), *Role of ivermectin in the prevention of SARS-CoV-2 infection among healthcare workers in India: A matched case-control study*, https://journals.plos.org/plosone/..le?id=10.1371/journal.pone.0247163.

11. **Bernigaud** et al., Annals of Dermatology and Venereology, doi:10.1016/j.annder.2020.09.231, *Ivermectin benefit: from scabies to COVID-19, an example of serendipity*, https://www.sciencedirect.com/science/article/pii/S015196382030627X.

12. **Budhiraja** et al., medRxiv, doi:10.1101/2020.11.16.20232223, *Clinical Profile of First 1000 COVID-19 Cases Admitted at Tertiary Care Hospitals and the Correlates of their Mortality: An Indian Experience*, https://www.medrxiv.org/content/10.1101/2020.11.16.20232223v1.

13. **Bukhari** et al., medRxiv, doi:10.1101/2021.02.02.21250840, *Efficacy of Ivermectin in COVID-19 Patients with Mild to Moderate Disease*, https://www.medrxiv.org/content/10.1101/2021.02.02.21250840v1.

14. **Cadegiani** et al., medRxiv, doi:10.1101/2020.10.31.20223883, *Early COVID-19 Therapy with Azithromycin Plus Nitazoxanide, Ivermectin or Hydroxychloroquine in Outpatient Settings Significantly Reduced Symptoms Compared to Known Outcomes in Untreated Patients*, https://www.medrxiv.org/content/10.1101/2020.10.31.20223883v1.

15. **Camprubí** et al., PLoS ONE, 15:11, doi:10.1371/journal.pone.0242184, *Lack of efficacy of standard doses of ivermectin in severe COVID-19 patients*, https://journals.plos.org/plosone/..le?id=10.1371/journal.pone.0242184.

16. **Carvallo** et al., medRxiv, doi:10.1101/2020.09.10.20191619, *Safety and Efficacy of the combined use of ivermectin, dexamethasone, enoxaparin and aspirin against COVID-19*, https://www.medrxiv.org/content/10.1101/2020.09.10.20191619v1.

17. **Carvallo (B)** et al., Journal of Biomedical Research and Clinical Investigation, doi:10.31546/2633-8653.1007, *Study of the Efficacy and Safety of Topical Ivermectin + Iota-Carrageenan in the Prophylaxis against COVID-19 in Health Personnel*, https://medicalpressopenaccess.com/upload/1605709669_1007.pdf.

18. **Carvallo (C)** et al., NCT04425850, *Usefulness of Topic Ivermectin and Carrageenan to Prevent Contagion of Covid 19 (IVERCAR)*, https://clinicaltrials.gov/ct2/show/results/NCT04425850.

19. **Chaccour** et al., EClinicalMedicine, doi:10.1016/j.eclinm.2020.100720 (preprint 12/7), *The effect of early treatment with ivermectin on viral load, symptoms and humoral response in patients with non-severe COVID-19: A pilot, double-blind, placebo-controlled, randomized clinical trial*, https://www.sciencedirect.com/science/article/pii/S2589537020304648.

20. **Chachar** et al., International Journal of Sciences, 9:31-35, doi:10.18483/ijSci.2378, *Effectiveness of Ivermectin in SARS-CoV-2/COVID-19 Patients*, https://www.ijsciences.com/pub/article/2378.

21. **Chala** et al., NCT04701710, *Prophylaxis Covid-19 in Healthcare Agents by Intensive Treatment With Ivermectin and Iota-carrageenan (Ivercar-Tuc)*, https://clinicaltrials.gov/ct2/show/NCT04701710.

22. **Concato** et al., NEJM, 342:1887-1892, doi:10.1056/NEJM200006223422507, https://www.nejm.org/doi/full/10.1056/nejm200006223422507.

23. **Deaton** et al., Social Science & Medicine, 210, doi:10.1016/j.socscimed.2017.12.005, *Understanding and misunderstanding randomized controlled trials*, https://www.sciencedirect.com/science/article/pii/S0277953617307359.

24. **Deng**, H., *PyMeta, Python module for meta-analysis*, http://www.pymeta.com/.

25. **Elalfy** et al., J. Med. Virol., doi:10.1002/jmv.26880, *Effect of a combination of Nitazoxanide, Ribavirin and Ivermectin plus zinc supplement (MANS.NRIZ study) on the clearance of mild COVID-1*, https://onlinelibrary.wiley.com/doi/10.1002/jmv.26880.

26. **Elgazzar** et al., Research Square, doi:10.21203/rs.3.rs-100956/v2, *Efficacy and Safety of Ivermectin for Treatment and prophylaxis of COVID-19 Pandemic*, https://www.researchsquare.com/article/rs-100956/v3.

27. **Elgazzar (B)** et al., Research Square, doi:10.21203/rs.3.rs-100956/v2, *Efficacy and Safety of Ivermectin for Treatment and prophylaxis of COVID-19 Pandemic*, https://www.researchsquare.com/article/rs-100956/v3.

28. **Espitia-Hernandez** et al., Biomedical Research, 31:5, *Effects of Ivermectin-azithromycin-cholecalciferol combined therapy on COVID-19 infected patients: A proof of concept study*, https://www.biomedres.info/biomedi..-proof-of-concept-study-14435.html.

29. **Gorial** et al., medRxiv, doi:10.1101/2020.07.07.20145979, *Effectiveness of Ivermectin as add-on Therapy in COVID-19 Management (Pilot Trial)*, https://www.medrxiv.org/content/10.1101/2020.07.07.20145979v1.

30. **Hashim** et al., medRxiv, doi:10.1101/2020.10.26.20219345, *Controlled randomized clinical trial on using Ivermectin with Doxycycline for treating COVID-19 patients in Baghdad, Iraq*, https://www.medrxiv.org/content/10.1101/2020.10.26.20219345v1.

31. **Hellwig** et al., International Journal of Antimicrobial Agents, doi:10.1016/j.ijantimicag.2020.106248, *A COVID-19 Prophylaxis? Lower incidence associated with prophylactic administration of Ivermectin*, https://www.sciencedirect.com/science/article/pii/S0924857920304684.

32. **Hill** et al., Research Square, doi:10.21203/rs.3.rs-148845/v1, *Meta-analysis of randomized trials of ivermectin to treat SARS-CoV-2 infection*, https://www.researchsquare.com/article/rs-148845/v1.

33. **Khan** et al., Archivos de Bronconeumología, doi:10.1016/j.arbres.2020.08.007, *Ivermectin treatment may improve the prognosis of patients with COVID-19*, https://www.archbronconeumol.org/e..ognosis-articulo-S030028962030288X.

34. **Kirti** et al., medRxiv, doi:10.1101/2021.01.05.21249310, *Ivermectin as a potential treatment for mild to moderate COVID-19: A double blind randomized placebo-controlled trial*, https://www.medrxiv.org/content/10.1101/2021.01.05.21249310v1.

35. **Kory** et al., FLCCC Alliance, *Review of the Emerging Evidence Demonstrating the Efficacy of Ivermectin in the Prophylaxis and Treatment of COVID-19*, https://covid19criticalcare.com/wp..axis-and-treatment-of-COVID-19.pdf.

36. **Krolewiecki** et al., SSRN, *Antiviral Effect of High-Dose Ivermectin in Adults with COVID-19: A Pilot Randomised, Controlled, Open Label, Multicentre Trial*, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3714649.

37. **Lawrie** et al., Preprint, *Ivermectin reduces the risk of death from COVID-19 – a rapid review and meta-analysis in support of the recommendation of the Front Line COVID-19 Critical Care Alliance*, https://b3d2650e-e929-4448-a527-4e..b655bd21b1448ba6cf1f4c59f0d73d.pdf.

38. **Lee** et al., Arch Intern Med., 2011, 171:1, 18-22, doi:10.1001/archinternmed.2010.482, *Analysis of Overall Level of Evidence Behind Infectious Diseases Society of America Practice Guidelines*, https://jamanetwork.com/journals/j..nternalmedicine/fullarticle/226373.

39. **Lima-Morales**, *Effectiveness of a multidrug therapy consisting of ivermectin, azithromycin, montelukast and acetylsalicylic acid to prevent hospitalization and death among ambulatory COVID-19 cases in Tlaxcala, Mexico*, https://www.sciencedirect.com/science/article/pii/S1201971221001004.

40. **Mahmud** et al., Clinical Trial Results, NCT04523831, *Clinical Trial of Ivermectin Plus Doxycycline for the Treatment of Confirmed Covid-19 Infection*, https://clinicaltrials.gov/ct2/show/results/NCT04523831?view=results.

41. **McLean** et al., Open Forum Infect. Dis. September 2015, 2:3, doi:10.1093/ofid/ofv100, *Impact of Late Oseltamivir Treatment on Influenza Symptoms in the Outpatient Setting: Results of a Randomized Trial*, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4525010/.

42. **Mohan** et al., *Ivermectin in mild and moderate COVID-19 (RIVET-COV): a randomized, placebo-controlled trial*, https://www.researchsquare.com/article/rs-191648/v1.

43. **Niaee** et al., Research Square, doi:10.21203/rs.3.rs-109670/v1, *Ivermectin as an adjunct treatment for hospitalized adult COVID-19 patients: A randomized multi-center clinical trial*, https://www.researchsquare.com/article/rs-109670/v1.

44. **Nichol** et al., Injury, 2010, doi: 10.1016/j.injury.2010.03.033, *Challenging issues in randomised controlled trials*, https://www.injuryjournal.com/article/S0020-1383(10)00233-0/fulltext.

45. **Okumuş** et al., NCT04646109, *Ivermectin for Severe COVID-19 Management*, http://www.metaevidence.org/viewStudy.aspx?study=6449.

46. **Podder** et al., IMC J. Med. Science, 14:2, July 2020, *Outcome of ivermectin treated mild to moderate COVID-19 cases: a single-centre, open-label, randomised controlled study*, http://imcjms.com/registration/journal_abstract/353.

47. **Raad** et al., ChiCTR2000033627, *In vivo use of ivermectin (IVR) for treatment for corona virus infected patients (COVID-19): a randomized controlled trial*, http://www.chictr.org.cn/showprojen.aspx?proj=54707.

48. **Rajter** et al., Chest, doi:10.1016/j.chest.2020.10.009, *Use of Ivermectin is Associated with Lower Mortality in Hospitalized Patients with COVID-19 (ICON study)*, https://www.sciencedirect.com/science/article/pii/S0012369220348984.

49. **Rezai** et al., IRCT20111224008507N3, *Effectiveness of Ivermectin in the Treatment of Coronavirus Infection in Patients admitted to Educational Hospitals of Mazandaran in 2020*, https://en.irct.ir/trial/49174.

50. **Schwartz**, E., Sheba Ivermectin Project, *Ivermectin vs. placebo treatment in non-hospitalized patients with COVID-19 - A double blind, randomized controlled trial*, https://vimeo.com/511687719.

51. **Shouman** et al., Journal of Clinical and Diagnostic Research, doi:10.7860/JCDR/2020/46795.0000, *Use of Ivermectin as a Potential Chemoprophylaxis for COVID-19 in Egypt: A Randomised Clinical Trial*, https://www.jcdr.net/articles/PDF/..Sh)_PF1(SY_OM)_PFA_(OM)_PN(KM).pdf.

52. **Soto-Becerra** et al., medRxiv, doi:10.1101/2020.10.06.20208066, *Real-World Effectiveness of hydroxychloroquine, azithromycin, and ivermectin among hospitalized COVID-19 patients: Results of a target trial emulation using observational data from a nationwide Healthcare System in Peru*, https://www.medrxiv.org/content/10.1101/2020.10.06.20208066v1.

53. **Spoorthi** et al., IAIM, 2020, 7:10, 177-182, *Utility of Ivermectin and Doxycycline combination for the treatment of SARSCoV-2*, http://iaimjournal.com/wp-content/..oads/2020/10/iaim_2020_0710_23.pdf.

54. **Sweeting** et al., Statistics in Medicine, doi:10.1002/sim.1761, *What to add to nothing? Use and avoidance of continuity corrections in meta-analysis of sparse data*, https://onlinelibrary.wiley.com/doi/10.1002/sim.1761.

55. **Treanor** et al., JAMA, 2000, 283:8, 1016-1024, doi:10.1001/jama.283.8.1016, *Efficacy and Safety of the Oral Neuraminidase Inhibitor Oseltamivir in Treating Acute Influenza: A Randomized Controlled Trial*, https://jamanetwork.com/journals/jama/fullarticle/192425.

56. **Vallejos** et al., Trials, doi:10.1186/s13063-020-04813-1, *Ivermectin to prevent hospitalizations in patients with COVID-19 (IVERCOR-COVID19): a structured summary of a study protocol for a randomized controlled trial*, https://trialsjournal.biomedcentra..rticles/10.1186/s13063-020-04813-1.

57. **Zhang** et al., JAMA, 80:19, 1690, doi:10.1001/jama.280.19.1690, *What's the relative risk? A method of correcting the odds ratio in cohort studies of common outcomes*, https://jamanetwork.com/journals/jama/fullarticle/188182.

Database of all ivermectin COVID-19 studies. 62 studies, 27 peer reviewed, 41 with results comparing treatment and control groups. Submit updates/corrections below. FLCCC provides treatment recommendations.

2/18	Early,...	*Covid Analysis...*	**meta-analysis v34**	Ivermectin is effective for COVID-19: real-tim...
	• 100% of the 41 studies to date report positive effects. Random effects meta-analysis for early tre...			
2/16	Early	*Elalfy et al., J. ...*	**viral+, ↓86.9%, p<...**	Effect of a combination of Nitazoxanide, Rib...
	Non-randomized controlled trial with 62 mild and early moderate patients with home treatment wit...			
2/15	PrEP...	*Behera et al., R...*	**cases, ↓83.0%, p...**	Prophylactic role of ivermectin in SARS-CoV-...
	Prospective prophylaxis study with 3,532 healthcare workers, 2,199 receiving two-dose ivermectin ...			
2/12	Early	*Schwartz, E., S...*	**hosp., ↓80.7%, p=...**	Ivermectin vs. placebo treatment in non-hos...
	Double blind RCT for mild-moderate COVID-19 outpatients in Israel showing significantly faster red...			
2/10	Late	*Lima-Morales ...*	**death, ↓77.7%, p<...**	Effectiveness of a multidrug therapy consisti...
	Prospective trial of 768 COVID-19 outpatients in Mexico, 481 treated with ivermectin, AZ, monteluk...			
2/5	Late	*Bukhari et al., ...*	**viral+, ↓82.4%, p<...**	Efficacy of Ivermectin in COVID-19 Patients ...
	RCT of relatively low risk hospitalized patients with 50 ivermectin and 50 control patients showing ...			
2/2	Early	*Mohan et al. (P...*	**no recov., ↓62.5%...**	Ivermectin in mild and moderate COVID-19 (...
	RCT in India with low risk patients, comparing 24mg ivermectin, 12mg ivermectin, and placebo sh...			
1/27	Meta	*Castaneda-Sa...*	**meta-analysis**	Outcomes of Ivermectin in the treatment of ...
	Student-written meta analysis of a very small subset of studies. This is the most biased and flawe...			
1/21	Early	*Chamie-Quintero et al., Preprint, doi:1...*		Sharp Reductions in COVID-19 Case Fatalitie...
	Analysis of ivermectin usage within states in Peru showing sharp reductions in COVID-19 deaths c...			
1/20	In Vit...	*Mody et al., Co...*	***in vitro***	Identification of 3-chymotrypsin like proteas...
	Computational molecular modeling screening and *in vitro* analysis for inhibitory effects on SARS-C...			
1/19	Late	*Rezai et al., IR...*	**recov. time, ↓21....**	Effectiveness of Ivermectin in the Treatment...
	RCT in Iran showing shorter time to clinical recovery with Ivermectin. Results are from: [1]			
1/19	Meta	*Hill et al., Rese...*	**meta-analysis**	Meta-analysis of randomized trials of iverme...

	Meta analysis of 18 ivermectin RCTs with 2,282 patients showing faster viral clearance (dose and ...				
1/16	Early	*Raad et al., Chi...*	hosp., ↓85.7%, p=...	In vivo use of ivermectin (IVR) for treatment ...	
	RCT in Lebanon showing significantly lower viral load at day 3, and lower hospitalization. Results a...				
1/16	Early	*Asghar et al., ...*	viral+, ↓82.1%, p<...	Efficacy of Ivermectin in COVID-19	
	RCT with 103 patients in Pakistan comparing ivermectin and CQ, showing significantly lower PCR...				
1/13	Early,...	*Kory et al., Fro...*	review	Review of the Emerging Evidence Demonstr...	
	Meta analysis of ivermectin clinical studies and natural experiments where ivermectin has been wi...				
1/12	Late	*Okumuş et al., ...*	death, ↓33.3%, p...	Ivermectin for Severe COVID-19 Management	
	Small RCT for severe COVID-19 comparing ivermectin with low dose HCQ+AZ+favipiravir, with 30 t...				
1/11	PrEP...	*Chala et al., N...*	cases, ↓94.7%, p...	Prophylaxis Covid-19 in Healthcare Agents b...	
	Prophylaxis RCT for ivermectin and iota-carrageenan in Argentina with 234 healthcare workers sh...				
1/11	N/A	*Bousquet-Mel...*	dosing study	Large Impact of obesity on the disposition of...	
	Animal dosing study with an obese dog model concluding that ivermectin maintenance doses sho...				
1/9	Early	*Kirti et al., med...*	death, ↓88.7%, p...	Ivermectin as a potential treatment for mild t...	
	RCT with 112 mild and moderate COVID-19 patients in India, showing lower mortality, ventilation, a...				
1/8	Early	*Chamie, J. (Ne...*	news	COVID-19 in Mexico	
	Comparison of COVID-19 death rates in Mexico showing that the only state using ivermectin has a...				
1/6	Early	*Babalola et al.,...*	viral+, ↓63.9%, p=...	Ivermectin shows clinical benefits in mild to ...	
	Small RCT comparing ivermectin 6mg & 12mg q84hr with lopinavir/ritonavir, showing a statisticall...				
1/6	PrEP...	*Hirsch et al., Microbiology & Infectious...*		Ivermectin as Prophylaxis Against COVID-19 ...	
	Report on ivermectin prophylaxis for healthcare workers in a hospital in Argentina, showing 0 case...				
1/3	Early,...	*Lawrie et al., P...*	meta-analysis	Ivermectin reduces the risk of death from C...	
	Meta analysis confirming the effectiveness of ivermectin for COVID-19, showing ivermectin treatm...				
12/31	Late	*Wijaya et al., Cermin Dunia Kedoktera...*		Ivermectin as a Potential Therapeutic Agent ...	
	Case report on 3 confirmed cases of COVID-19 with significant clinical and radiological improvem...				
12/31	Animal	*Madrid et al., H...*	animal study	Safety of oral administration of high doses o...	
	In vivo analysis of the safety of high dose ivermectin with a Corydoras fish animal model.				
12/30					

	Revie...	*McCullough et...*	review	Multifaceted highly targeted sequential multi...	Review urging early treatment of COVID-19 with sequential multidrug treatment that has been sho...
12/30	Early	*Procter et al., Reviews in Cardiovascul...*		Clinical outcomes after early ambulatory mu...	Retrospective 922 outpatients, with 320 treated early due to age>50 or comorbidities, showing 2.2...
12/27	Meta	*Hill, A., Preprin...*	meta-analysis	Meta-analysis of clinical trials of ivermectin t...	WHO-funded meta analysis showing ivermectin treatment mortality relative risk RR 0.17 [0.08-0.35...
12/24	In Vit...	*Jeffreys et al., ...*	*in vitro*	Remdesivir-Ivermectin combination displays...	*In Vitro* study showing enhanced antiviral activity of ivermectin and remdesivir in combination.
12/20	PrEP...	*Vallejos et al., ...*	cases, ↓73.6%, p...	Ivermectin to prevent hospitalizations in pati...	Report on ivermectin + carrageenan prophylaxis in a hospital in Argentina showing lower cases for...
12/18	Early,...	*Kory et al., FLC...*	meta-analysis	Review of the Emerging Evidence Demonstr...	Meta analysis of ivermectin clinical studies and natural experiments where ivermectin has been wi...
12/15	PrEP...	*Alam et al., Eur...*	cases, ↓90.6%, p...	Ivermectin as Pre-exposure Prophylaxis for ...	91% reduction in COVID-19 cases with ivermectin prophylaxis. 118 healthcare workers in Banglade...
12/15	Early	*Afsar et al., SS...*	symptoms, ↓92.2...	Ivermectin Use Associated with Reduced Du...	Small 95 patient study in Pakistan adding ivermectin to standard of care (HCQ+AZ) for outpatients...
12/11	Early	*Hussain et al., International Journal of...*		Outcome of ivermectin and doxycycline in ca...	Small case study of ivermectin + doxycycline with 8 cancer patients, with all patients becoming PC...
12/7	Early	*Chaccour et al....*	symptoms, ↓52.9...	The effect of early treatment with ivermectin...	Tiny RCT for early treatment of mild COVID-19 in low risk patients, with 12 400mcg/kg single dose ...
12/4	In Vit...	*Surnar et al., A...*	*in vitro*	Clinically Approved Antiviral Drug in an Orally...	*In Vitro* analysis of ivermectin with orally administrable nanoparticles showing efficacy for decreas...
12/2	Early	*Ahmed et al., I...*	symptoms, ↓85.0...	A five day course of ivermectin for the treat...	Small 72 patient RCT of ivermectin and ivermectin + doxycycline showing faster recovery with iver...
12/2	Early	*Chamie, J. (Ne...*	news	The effect of using ivermectin to control CO...	After starting to distribute ivermectin in drug kits in July, the Mexican state of Chiapas has seen a ...
12/1	Early	*Alonso et al., (...*	death, ↓91.8%, p...	COVID-19: Uso de ivermectina	Observational study in Argentina showing significantly lower mortality in the 60 days after adoptin...

11/28	PrEP...	*Bernigaud et al...*	death, ↓99.4%, p...	Ivermectin benefit: from scabies to COVID-1...

69 residents of a French care home, median age 90, were treated with ivermectin for a scabies out...

11/28	PrEP...	*Hellwig et al., I...*	cases, ↓78.0%, p...	A COVID-19 Prophylaxis? Lower incidence as...

Analysis of COVID-19 cases vs. widespread prophylactic use of ivermectin for parasitic infections ...

11/24	Late	*Niaee et al., Re...*	death, ↓81.8%, p...	Ivermectin as an adjunct treatment for hospi...

82% lower mortality with ivermectin. RCT with 180 hospitalized patients showing reduced mortalit...

11/22	Animal	*de Melo et al., ...*	animal study	Anti-COVID-19 efficacy of ivermectin in the g...

Hamster study finding significantly lower COVID-19 pathology although not finding lower viral load...

11/18	Late	*Budhiraja et al....*	death, ↓99.1%, p...	Clinical Profile of First 1000 COVID-19 Cases...

Retrospective 976 hospitalized patients with 34 treated with ivermectin showing ivermectin mortal...

11/17	PrEP...	*Carvallo et al., ...*	cases, ↓99.9%, p...	Study of the Efficacy and Safety of Topical Iv...

Prophylaxis study using ivermectin and carrageenan showing 0 of 788 cases from treated healthc...

11/14	Late	*Spoorthi et al., ...*	recov. time, ↓21....	Utility of Ivermectin and Doxycycline combin...

100 patient prospective trial of ivermectin + doxycycline showing reduced time to symptom resolu...

11/13	PrEP...	*Elgazzar et al., ...*	cases, ↓80.0%, p...	Efficacy and Safety of Ivermectin for Treatm...

RCT for prophylaxis with ivermectin showing a significant reduction in cases with treatment. Relati...

11/13	Late	*Elgazzar et al., ...*	death, ↓91.7%, p<...	Efficacy and Safety of Ivermectin for Treatm...

RCT comparing ivermectin + SOC vs. HCQ + SOC, showing a significant reduction in mortality with...

11/11	Late	*Camprubí et al...*	ICU, ↓33.3%, p=1....	Lack of efficacy of standard doses of iverme...

Tiny 26 patients retrospective study of ivermectin 200 µg/kg, median 12 days after symptoms, not...

11/11	Early	*Krolewiecki et al., SSRN (Preprint)*		Antiviral Effect of High-Dose Ivermectin in A...

Viral load RCT finding a concentration dependent antiviral activity of oral high dose ivermectin at a ...

11/10	Revie...	*Turkia, M., Res...*	review	FLCCC Alliance MATH+ ascorbic acid and I-...

Review suggesting ivermectin should be used based on existing data suggesting significant benefi...

11/4	Early	*Cadegiani et al...*	death, ↓78.3%, p...	Early COVID-19 Therapy with Azithromycin P...

Comparison of HCQ, nitazoxanide, and ivermectin showing similar effectiveness for overall clinical...

11/3	Early,...	*Morgenstern et al., J. Clinical Trials (pr...*		The Use of Compassionate Ivermectin in the...

Retrospective 3,099 outpatients treated with ivermectin in an ER. Of 2,706 treated on an outpatient...

11/3	PrEP...	*Behera et al., P...*	cases, ↓53.8%, p...	Role of ivermectin in the prevention of SARS-...	Retrospective matched case-control prophylaxis study for HCQ, ivermectin, and vitamin C with 37...
11/2	Animal	*Arévalo et al., ...*	animal study	Ivermectin reduces coronavirus infection in v...	Mouse study showing ivermectin reducing MHV viral load and disease. MHV is a type 2 family RN...
10/31	PrEP...	*Chang et al., ResearchGate (Preprint)*		COVID-19: Effectiveness of pre-exposure pro...	Pre-exposure prophylaxis study with 129 people split into high/low exposure groups, with each gro...
10/26	Late	*Hashim et al., ...*	death, ↓66.7%, p...	Controlled randomized clinical trial on using ...	RCT 70 ivermectin-doxycycline patients and 70 control patients showing reduced time to recovery ...
10/22	PrEP...	*Guerrero et al., Colombia Médica, doi:...*		COVID-19: The Ivermectin African Enigma	Study of African Programme for Onchocerciasis Control (APOC) countries, which used ivermectin, ...
10/19	PrEP...	*Carvallo et al., ...*	cases, ↓96.3%, p...	Usefulness of Topic Ivermectin and Carrage...	Prophylaxis study using ivermectin and carrageenan showing 0 of 131 cases from treated healthc...
10/13	Late	*Rajter et al., Ch...*	death, ↓46.0%, p...	Use of Ivermectin is Associated with Lower ...	Retrospective 280 hospitalized patients showing lower mortality with ivermectin (13.3% vs 24.5%),...
10/9	Late	*Mahmud et al.,...*	death, ↓85.8%, p...	Clinical Trial of Ivermectin Plus Doxycycline f...	RCT for ivermectin+doxycycline showing improvements in mortality, recovery, progression, and vir...
10/8	Theory	*Francés-Mone...*	theory	Has Ivermectin Virus-Directed Effects agains...	*In silico* study showing that ivermectin is capable of interfering in different key steps of the SARS-C...
10/8	Late	*Soto-Becerra e...*	death, ↓17.1%, p...	Real-World Effectiveness of hydroxychloroqu...	Retrospective database study of 5683 patients, 692 received HCQ/CQ+AZ, 200 received HCQ/CQ, ...
9/30	Late	*Chachar et al., ...*	no recov., ↓10.0%...	Effectiveness of Ivermectin in SARS-CoV-2/...	Small RCT with 25 ivermectin and 25 control patients, not finding a significant difference in recove...
9/24	Late	*Khan et al., Arc...*	death, ↓87.0%, p<...	Ivermectin treatment may improve the progn...	Retrospective 115 ivermectin patients and 133 control patients showing significantly lower death ...
9/22	In Vit...	*Li et al., J. Cell...*	*in vitro*	Quantitative proteomics reveals a broad-spe...	*In Vitro* study showing Ivermectin is a safe wide-spectrum antiviral against SARS-CoV-2, human pa...
9/15	Early	*Carvallo et al., ...*	death, ↓87.9%, p...	Safety and Efficacy of the combined use of i...	Prospective trial of ivermectin, dexamethasone, enoxaparin, and aspirin. There was one death fro...

9/15	Revie...	*Jans et al., Cell...*	review	Ivermectin as a Broad-Spectrum Host-Direct...	Review of ivermectin as a host-directed broad-spectrum antiviral agent for a range of viruses, inclu...
9/3	Late	*Podder et al., I...*	recov. time, ↓16....	Outcome of ivermectin treated mild to mode...	Small RCT with 32 ivermectin patients and 30 control patients. The mean recovery time after enrol...
8/28	PrEP...	*Shouman et al....*	symp. case, ↓91....	Use of Ivermectin as a Potential Chemoprop...	PEP trial for asymptomatic close contacts of COVID-19 patients, 203 ivermectin patients and 101 ...
8/15	Early	*Espitia-Hernan...*	viral+, ↓97.2%, p<...	Effects of Ivermectin-azithromycin-cholecalc...	Small study with 28 patients treated with ivermectin + AZ + cholecalciferol and 7 control patients. ...
8/14	Late	*Bhattacharya et al., Int. J. Scientific Re...*		Observational Study on Clinical Features, Tre...	Retrospective 148 hospitalized patients showing triple therapy with ivermectin + atorvastatin + N-a...
7/31	Late	*Chang et al., ResearchGate (Preprint)*		Post-acute or prolonged COVID-19: ivermecti...	Report on 33 patients with persistent or post-acute symptoms treated with ivermectin, showing a ...
7/31	Theory	*Chang et al., R...*	theory	COVID-19: Post-exposure prophylaxis with iv...	Proposed PEP protocol based on ivermectin.
7/31	Late	*Alam et al., Journal of Bangladesh Col...*		A Case Series of 100 COVID-19 Positive Pati...	Case study of 100 patients treated with ivermectin and doxycycline, with no ICU admission, deaths...
7/31	Late	*Rahman et al., J. Bangladesh Coll. Phy...*		Comparison of Viral Clearance between Iver...	Comparison of 200 patients treated with ivermectin + doxycycline and 200 treated with HCQ + AZ. ...
7/14	Early	*Chowdhury et al., Research Square, do...*		A Randomized Trial of Ivermectin-Doxycyclin...	Small 116 patient RCT comparing Ivermectin-Doxycycline and HCQ+AZ, not showing a significant ...
7/8	Late	*Gorial et al., m...*	death, ↓71.0%, p...	Effectiveness of Ivermectin as add-on Thera...	Small trial of hospitalized patients with 16 of 87 patients being treated with ivermectin showing a s...
6/30	In Vit...	*Caly et al., Anti...*	*in vitro*	The FDA-approved drug ivermectin inhibits t...	*In Vitro* study showing that ivermectin is an inhibitor of SARS-CoV-2, with a single addition to Vero-...
6/19	Theory	*Lehrer et al., In...*	theory	Ivermectin Docks to the SARS-CoV-2 Spike R...	*In silico* analysis showing ivermectin docking which may interfere with the attachment of the spike...
6/12	Revie...	*Heidary et al., ...*	review	Ivermectin: a systematic review from antivira...	Review of the antimicrobial, antiviral, and anti-cancer properties of ivermectin. Antiviral effects hav...

5/2	Early	*Chang, G., Research Gate, doi:10.1314...*	Inclusión de la ivermectina en la primera líne...
	Peru observational case study of 7 patients treated with ivermectin, showing improvement and res...		

For search methods, inclusion criteria, effect extraction criteria (more serious outcomes have priority), PRISMA answers, and statistical methods see ivmmeta.com. In Vitro, Ex Vivo, Meta, Theory, Safety, Review, and News items are not included in the study count. There is a total of 82 items. Studies with preprints and journal versions are listed under the earlier preprint date.