Treatment of COVID in 2023

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A good “Therapeutic Plan” should answer many questions:

- Can we prevent the next epidemic? Lesson learned?
- Who is the best to be in charge ? For decisions like lockown, testing , preparedness….
- Private sector role: Vaccines, therapies… royalties
- World health organisation role: Access to care…. Equality
- Standars of care: how quickly they can be applied ?
- How to deal with false information? Conspiracy theories? Media, social media. ……..

What Do we know the origin of COVID19?

WHO investigator visit to Wuhan mid-January to mid-February 2021

They detailed 4 scenarios by which SARS-CoV-2 could have emerged:

- Bats through another animal (very likely)
- Direct spread from bats to humans (likely)
- Cold-chain food products (possible but not likely)
- Laboratory leak (extremely unlikely)

NEWS | 14 February 2023 | Update 03 March 2023

WHO abandons plans for crucial second phase of COVID-origins investigation

Sensitive studies in China were intended to pinpoint the source of the pandemic virus.

End of story!

- Chinese officials rejected the WHO's plans, taking particular issue with the proposal to investigate lab breaches.
- Zhao Lijian, the spokesperson for China's foreign ministry, said the WHO proposal was not approved by all member states, and that the second phase should not focus on pathways the mission report had already deemed extremely unlikely.
- The Chinese ministry of foreign affairs did not respond to *Nature*'s e-mailed requests for comment on why the phase-two studies have stalled.

Blood-donors study

- In May last year, researchers in Beijing and Wuhan published the results[1] of an analysis of donor blood supplied to the Wuhan Blood Center before December 2019.

- The researchers were looking for SARS-CoV-2 antibodies that could signify some of the earliest infections in the pandemic. The team screened more than 88,000 plasma samples collected between 1 September and 31 December 2019, but did not find any SARS-CoV-2-blocking antibodies in the samples.

- The results are supporting earlier genomic analyses[2] showing that the virus probably had not emerged as early as September and was not widespread in Wuhan in late 2019.

SAINT GEORGE HOSPITAL
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Bats a very interesting

- There are 1000 species of bats, they make 25% of all mammal species
- Bat is the a reservoir for the coronavirus, Ebola, MERS-CoV…
- They have an attenuated “DNA Sensing” aspect of their immune system which allows viruses to survive in their body without any inflammation or disease.

(https://www.nytimes.com/2020/01/28/science/bats-coronavirus-Wuhan.html)

Intermediate Host

Pangolin; another mammal. Studies on genome of SARS-CoV-2 showed that pangolins may have passed new coronavirus from bats to humans.

https://theconversation.com/study-shows-pangolins-may-have-passed-new-coronavirus-from-bats-to-humans-135687
https://zhanglab.ccmb.med.umich.edu/COVID-19/

What are the odds of a new epidemics?

- The quick urbanisation of China, east Asia and Africa: We invaded the natural habitat of many infectious agents!
- Aviation
- Screening at Airport / Ports: The ridicilous temprature checking to the cumbersome work of testing

Who should be in charge??

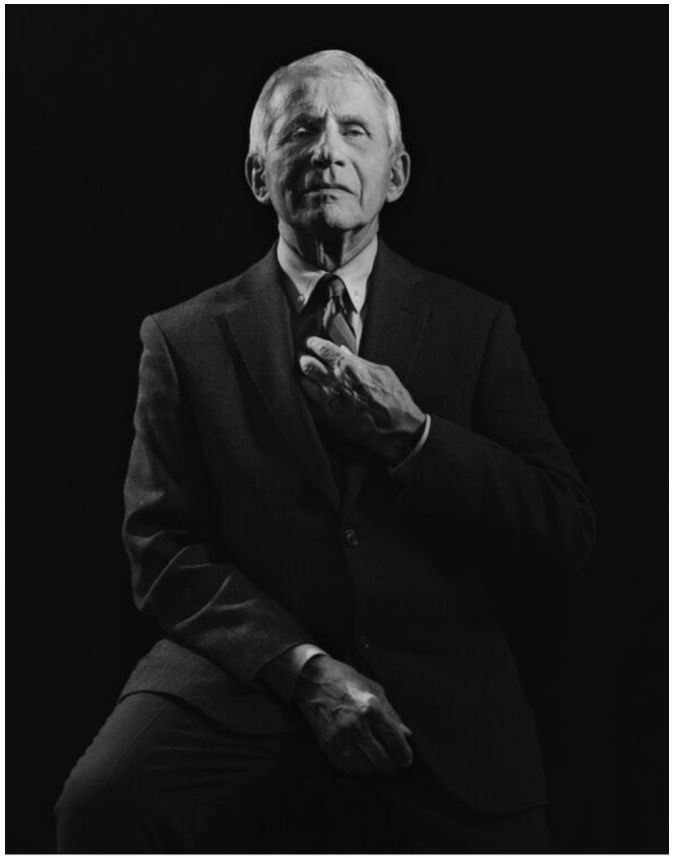
- Prime minister, Health minister, Education minister ...
- Role of Subject Matter Experts
- Committee with excutive power or not ?
- Public and private sector
- Community leaders
- Role of WHO …

CRIME | **GERMANY**

COVID: German health chief receives death threats

10/15/2021

Lothar Wieler, the president of the Robert Koch Institute for disease control, has said he received several threatening messages from critics of government policies over the course of the coronavirus pandemic.



Philip Montgomery for The New York Times

Dr. Fauci Looks Back: 'Something Clearly Went Wrong'

NyTimes interview April 25 2023

Fauci: Yeah — I could say, well, hey, we tried our best, and we still got screwed, so we're going to get screwed no matter what happens in the next one. I don't think that's an appropriate response. I think we can still improve significantly. And I put it into two general buckets. First, the scientific preparedness and response, and then the public-health preparedness and response.

On January 31 2021, the newly appointed government in Lebanon established a **National Committee for COVID-19 (NCC)** to oversee the COVID-19 national preparedness and response.

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والإجراءات الوقائية لفيروس كورونا

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Viewpoint

July 23, 2020

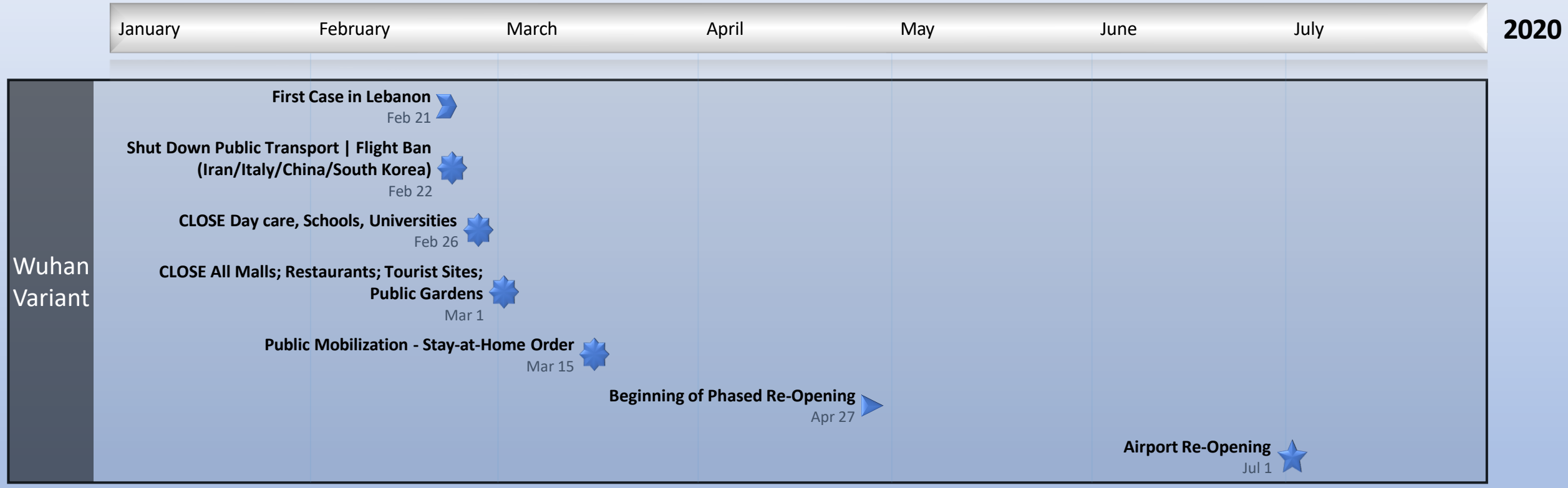
COVID-19 Response in Lebanon

Current Experience and Challenges in a Low-Resource Setting

Petra Khoury, PharmD[1]; Eid Azar, MD[2]; Eveline Hitti, MD, MBA[3]

» Author Affiliations | Article Information

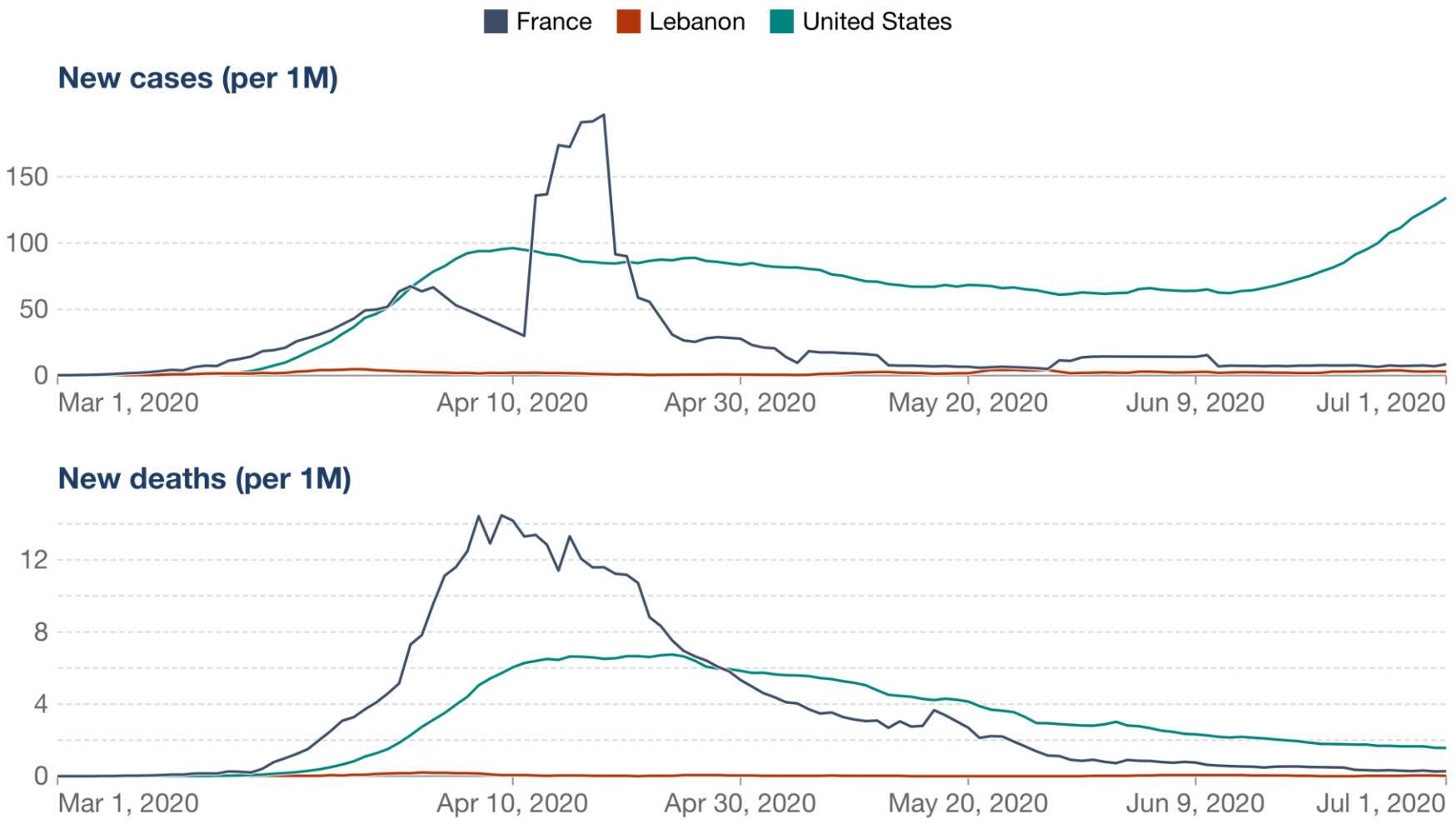
JAMA. 2020;324(6):548-549. doi:10.1001/jama.2020.12695


January
February
March
April
May
June
July
2020
Wuhan Variant
First Case in Lebanon
Feb 21
Shut Down Public Transport | Flight Ban (Iran/Italy/China/South Korea)
Feb 22
CLOSE Day care, Schools, Universities
Feb 26
CLOSE All Malls; Restaurants; Tourist Sites; Public Gardens
Mar 1
Public Mobilization - Stay-at-Home Order
Mar 15
Beginning of Phased Re-Opening
Apr 27
Airport Re-Opening
Jul 1

Daily new confirmed COVID-19 cases & deaths per million people

7-day rolling average. Limited testing and challenges in the attribution of cause of death means the cases and deaths counts may not be accurate.

Our World in Data



Source: Johns Hopkins University CSSE COVID-19 Data

Aborting the first wave allowed:

- Hospital preparedness was ramped up from 1 to 15 COVID19 ready hospitals, personal protective equipment and ventilators were secured for designated sites and testing capabilities were improved.

- 29 labs have COVID19 testing capabilities and 15 hospitals are fully prepared to receive COVID19 patients bringing the number of COVID dedicated/ready beds to 1365 out of the country's total of 15195.

- Ventilator capacity was increased by 20% for a total of 1424 vents.

MASK

Cochrane Database of Systematic Reviews | Review - Intervention

Physical interventions to interrupt or reduce the spread of respiratory viruses

Tom Jefferson, Liz Dooley, Eliana Ferroni, Lubna A Al-Ansary, Mieke L van Driel, Ghada A Bawazeer, Mark A Jones, Tammy C Hoffmann, Justin Clark, Elaine M Beller, Paul P Glasziou, John M Conly Authors' declarations of interest

Version published: 30 January 2023 Version history

https://doi.org/10.1002/14651858.CD006207.pub6

There is uncertainty about the effects of face masks.

The low to moderate certainty of evidence means our confidence in the effect estimate is limited, and that the true effect may be different from the observed estimate of the effect.

- The pooled results of RCTs did not show a clear reduction in respiratory viral infection with the use of medical/surgical masks.

- There were no clear differences between the use of medical/surgical masks compared with N95/P2 respirators in healthcare workers when used in routine care to reduce respiratory viral infection.

- Hand hygiene is likely to modestly reduce the burden of respiratory illness

Facui on Mask Use

Fauci: It's a good point in general, but I disagree with your premise a bit. From a broad public-health standpoint, at the population level, masks work at the margins — maybe 10 percent. But for an individual who religiously wears a mask, a well-fitted KN95 or N95, it's not at the margin. It really does work.

But I think anything that instigated or intensified the culture wars just made things worse. And I have to be honest with you, David, when it comes to masking, I don't know. But I do know that the culture wars have been really, really tough from a public-health standpoint. Ultimately an epidemiologist sees it as an epidemiological phenomenon. An economist sees it from an economic standpoint. And I see it from somebody in bed dying. And that's the reason it just bothers me a lot — maybe more so than some others — that because of the culture wars you're talking about, there are people who are not going to make use of an intervention that could have saved their lives.

Fauci with President Donald Trump at the Vaccine Research Center in Bethesda, Md., on March 3, 2020. Doug Mills/The New York Times

Transmission. | Airborn Droplet Formite…

Exaggerated risk of transmission of COVID-19 by fomites

Published Online
July 3, 2020
https://doi.org/10.1016/
S1473-3099(20)30561-2

This online publication has been corrected. The corrected version first appeared at thelancet.com/infection on July 30, 2020

A clinically significant risk of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) transmission by fomites (inanimate surfaces or objects) has been assumed on the basis of studies that have little resemblance to real-life scenarios.

The longest survival (6 days) of severe acute respiratory syndrome coronavirus (SARS-CoV) on surfaces was done by placing a very large initial virus titre sample (10^7 infectious virus particles) on the surface being tested.[1] Another study that claimed survival of 4 days used a similarly large sample (10^6 infectious virus particles) on the surface.[2] A report by van Doremalen and colleagues found survival of both SARS-CoV and SARS-CoV-2 of up to 2 days (on surfaces) and 3 days (in aerosols generated in the laboratory), but again with a large inoculum (10^5–10^7 infectious virus particles per mL in aerosols, 10^4 infectious virus particles on surfaces).[3] Yet another study found long survival (5 days) of human coronavirus 229E on surfaces with what I would still consider a substantially large viral load (10^3 plaque-forming units) in a cell lysate.[4] However, using a cell lysate rather than purified or semipurified virus might enable initial viral proliferation or protection from the effects of the sample drying out.

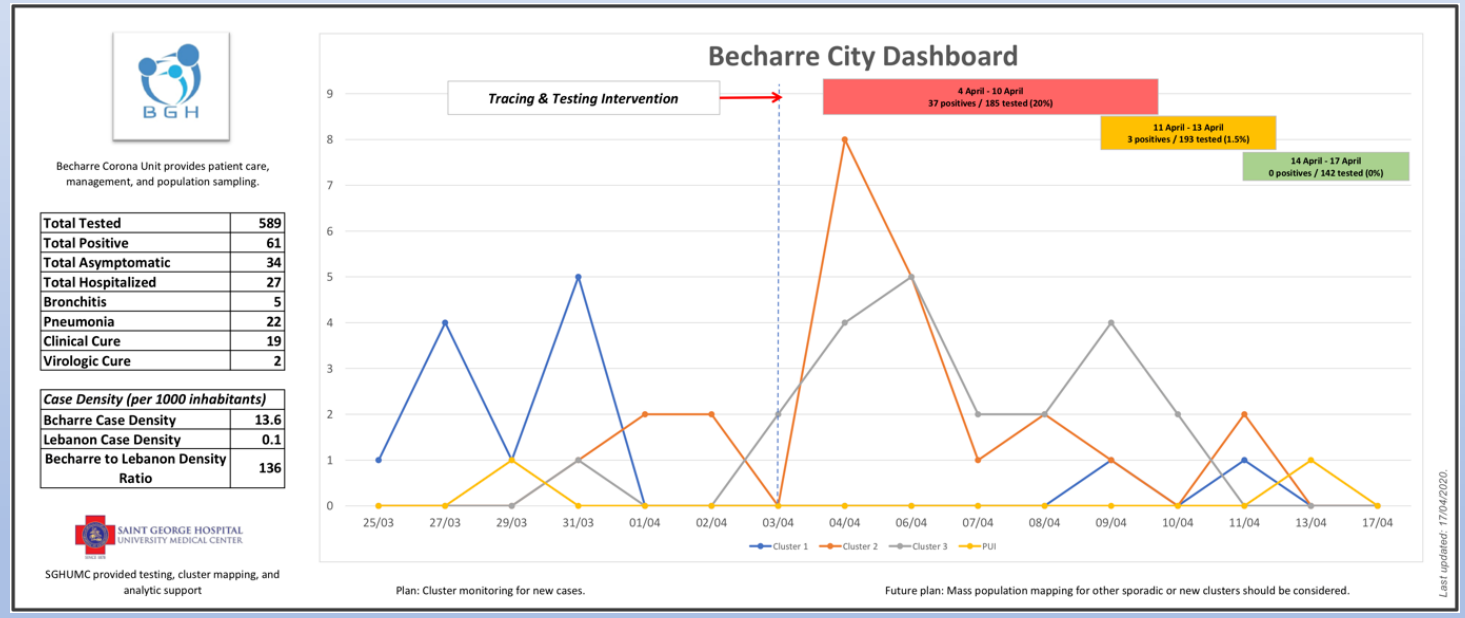
None of these studies present scenarios akin to real-life situations. Although I did not find measurements of coronavirus quantities in aerosol droplets from patients, the amount of influenza virus RNA in aerosols has been measured, with a concentration equivalent to 10–100 viral particles in a droplet, with even fewer infectious influenza virus particles capable of growth in a plaque assay.[5] By contrast, one study found human coronavirus 229E to survive for only 3–6 h (depending on the surface tested), and human coronavirus OC43 to survive for 1 h, after drying on various surfaces including aluminum, sterile latex surgical gloves, and

Containment Strategy:

- Test or not to test?
- Pcr v/s Ag v/s Antibodies
- Isolation policy and duration
- Test of cure
- Asymtomatic transmission
- Super spreadears
- Dispertion Factor
- Zero covid and Lockdowns
- Herd Immunity

Lebanon Test and Trace Program

- Worked when the numbers were low
- Challenge at MOPH level; Tracing manually by House Visit & Pen-Paper
- Thechnology matters, PCR mass testing



Daily new confirmed COVID-19 cases per million people

7-day rolling average. Due to limited testing, the number of confirmed cases is lower than the true number of infections.

Our World in Data

LINEAR LOG

Source: Johns Hopkins University CSSE COVID-19 Data

Feb 26, 2020 — Sep 12, 2022

CHART | MAP | TABLE | SOURCES | DOWNLOAD

Herd Immunity

Fauci: Well, I don't think anybody did anything wrong. What went wrong was that the virus did not act the way one would have thought the virus would act. We made an assumption that turned out to be an incorrect assumption — that this was going to act like other viruses.

- The classical definition of herd immunity has been completely turned upside down by Covid. And let me go through the steps. Herd immunity is based on two premises: one, that the virus doesn’t change, and two, that when you get infected or vaccinated, the durability of protection is measured in decades, if not a lifetime.

- With SARS-CoV-2, we thought protection against infection was going to be measured in a long period of time. And we found out — wait a minute, protection against infection, and against severe disease, is measured in months, not decades. No. 2, the virus that you got infected with in January 2020 is very different from the virus that you’re going to get infected with in 2021 and 2022.

Properties of an ideal vaccine

Ideally, a vaccine should:

- produce the **same immune protection** which usually follows natural infection but without causing disease
- generate **long lasting immunity** so that the person is protected if they are exposed to the antigen several years after vaccination
- **interrupt the spread of infection** by preventing carriage of the organism in the vaccinated person

- Vaccines need to be **safe** and the risk from any side effects should be much lower than the benefit of preventing deaths and serious complications of the disease.

- Widely available, affordable….

Pharmaceutical CEOs to G7: Protect Intellectual Property Rights and Pathogen Access in WHO Pandemic Accord

Pandemic Preparedness 14/04/2023 · Stefan Anderson

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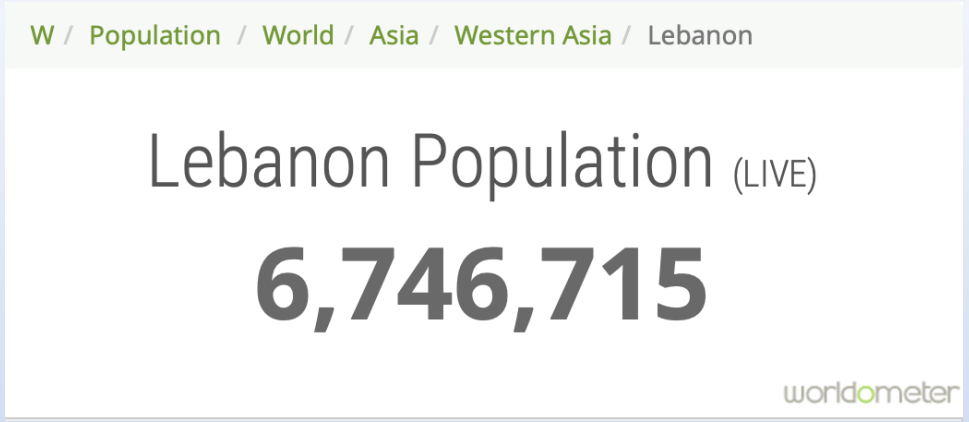
Pharmaceutical industry groups say the current draft of the World Health Organization's pandemic treaty would leave the world less prepared for the next global outbreak.



Lebanon remains the country hosting the largest number of refugees per capita, with the Government estimation of 1.5 M Syrian refugees, ~200,000 Palestinian refugees, and some 14,815 refugees of other nationalities.[1.] **~25% Refugee Population**

Despite the economic crisis and the blast, Lebanon has been able to secure multiple COVID-19 vaccines for all inhabitants on Lebanese Territories.

1. UNHCR – Lebanon factsheet September 2021

On January 31 2021, the newly appointed government established a

National Committee for COVID-19 (NCC)

to oversee the COVID-19 national preparedness and response with participation of the private sectors (hospitals, universities, local businesses, etc.)

REPUBLIC OF LEBANON
MINISTRY OF PUBLIC HEALTH

MOPH - Lebanon National Deployment and Vaccination Plan for COVID-19 Vaccines.

With the launch of the COVID-19 vaccines in 2021, a new committee was formed:

Lebanese Vaccine Executive Committee (VEC)

mainly tasked with decision-making that ensures an equitable and effective roll-out of the vaccine in Lebanon.

Lebanon's Vaccination Plan

February 2021

Age-based Priority (Elderly >>> Young)

Priority groups for vaccine administration

- **Phase 1A**
  - HCWs (by priority as per guidelines in the COVID-19 vaccine initiative)
  - Age ≥75 yrs. irrespective of comorbidity
- **Phase 1B**
  - Age 65 - 74 yrs. irrespective of comorbidity
  - Age 55 - 64 yrs. + ≥1 comorbidity
  - Epidemiology & surveillance staff – house visits
- **Phase 2A**
  - Age 55-64 yrs. not included before
  - Age 16-54 + ≥1 comorbidity
  - HCWs not included before (as per guidelines in the initiative)

October 2021

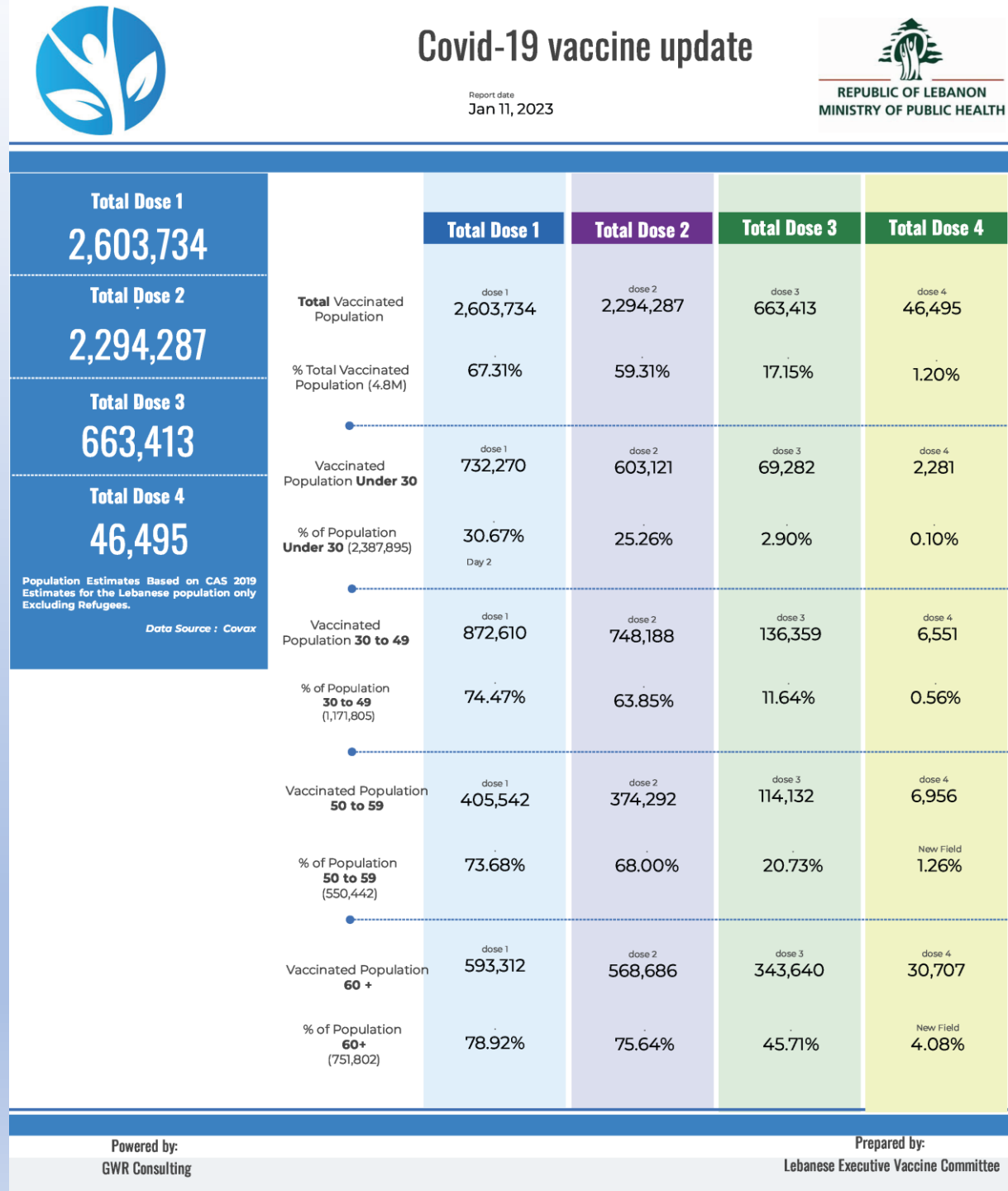
Access to all the population

Lebanon's Vaccination Plan

Early Success >>> Current Situation

Median Age of death in COVID -19 patients Lebanon. December 2020 ; May 20 2021

December 2020	Deaths	437
	Median	75
January 2021	Deaths	1253
	Median	75
February 2021	Deaths	1610
	Median	75
March 2021	Deaths	1500
	Median	73
April 2021	Deaths	826
	Median	73
May 2021	Deaths	356
	Median	70



Common sense conclusion:

Vaccinate well the old and sick population

Antivirals

- When you consider antiviral for Acute viral ilness
  You should start very early, this is true for Flu, Herpes, Zoster…

- In any distribution of patients there will be a significant majority that will have no symptoms or very mild disease and at symtoms onset you cant predict who will have severe illness

- So if you decide to use antiviral, to show efficacy you need a very large number of patients to be treated very early

- Using antivirals late into disease progression is absurd

Steroids

Contents lists available at ScienceDirect

European Journal of Pharmacology

journal homepage: www.elsevier.com/locate/ejphar

Use of steroids in COVID-19 patients: A meta-analysis

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ARTICLE INFO

Keywords:
COVID-19
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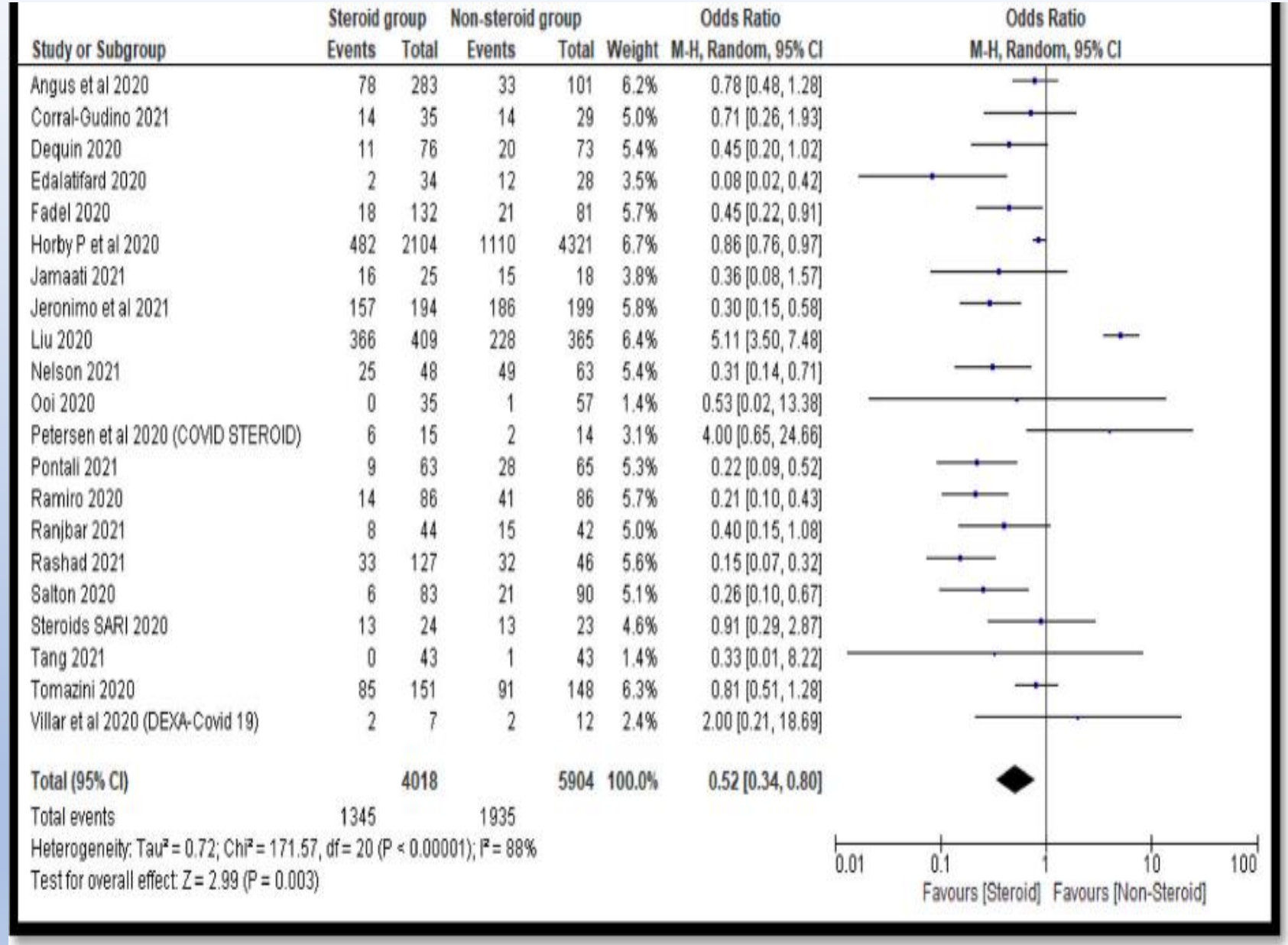
Methylprednisolone
Dexamethasone
Hydrocortisone
Meta-analysis

ABSTRACT

Background: Emerging reports have shown the benefits of steroids in hospitalized COVID-19 patients as life-saving drugs. However, the use of steroids in COVID-19 patients is confusing among many physicians.
Aim: The aim of the current study was to find out the exact association of steroids in the deaths of COVID-19 patients.
Methods: The relevant studies were searched in PubMed, Google scholar, and Clinical trials registries till May 25, 2021 and sorted out based on inclusion and exclusion criteria. The quality of studies was assessed using a standard scale. The pooled odds ratio was calculated with a 95% confidence interval. The sensitivity and sub-group analyses were also done. The publication bias was assessed qualitatively. The Rev Man 5 was used for all analyses with a random-effect model.
Results: The quantitative analysis was done with 9922 patients (6265-male and 3657-females) from 21 relevant studies. The pooled estimate results i.e. 0.52 [0.34, 0.80] have shown a significant reduction in deaths of COVID-19 patients in the steroidal group as compared to the non-steroidal group. The sensitivity analyses did not alter our conclusions. In subgroup analysis, methylprednisolone has shown a significant reduction in deaths of COVID-19 patients as compared to the non-steroidal group, however, more clinical evidence is required for dexamethasone and hydrocortisone.
Conclusion: The use of steroids in hospitalized COVID-19 patients is useful to reduce deaths.

Steroids: Life-saving drugs in hospitalized COVID 19 patients

The pooled estimate OR 0.52 [0.34, 0.80]



Study or Subgroup	Steroid group Events	Total	Non-steroid group Events	Total	Weight	Odds Ratio M-H, Random, 95% CI
Angus et al 2020	78	283	33	101	6.2%	0.78 [0.48, 1.28]
Corral-Gudino 2021	14	35	14	29	5.0%	0.71 [0.26, 1.93]
Dequin 2020	11	76	20	73	5.4%	0.45 [0.20, 1.02]
Edalatifard 2020	2	34	12	28	3.5%	0.08 [0.02, 0.42]
Fadel 2020	18	132	21	81	5.7%	0.45 [0.22, 0.91]
Horby P et al 2020	482	2104	1110	4321	6.7%	0.86 [0.76, 0.97]
Jamaati 2021	16	25	15	18	3.8%	0.36 [0.08, 1.57]
Jeronimo et al 2021	157	194	186	199	5.8%	0.30 [0.15, 0.58]
Liu 2020	366	409	228	365	6.4%	5.11 [3.50, 7.48]
Nelson 2021	25	48	49	63	5.4%	0.31 [0.14, 0.71]
Ooi 2020	0	35	1	57	1.4%	0.53 [0.02, 13.38]
Petersen et al 2020 (COVID STEROID)	6	15	2	14	3.1%	4.00 [0.65, 24.66]
Pontali 2021	9	63	28	65	5.3%	0.22 [0.09, 0.52]
Ramiro 2020	14	86	41	86	5.7%	0.21 [0.10, 0.43]
Ranjbar 2021	8	44	15	42	5.0%	0.40 [0.15, 1.08]
Rashad 2021	33	127	32	46	5.6%	0.15 [0.07, 0.32]
Salton 2020	6	83	21	90	5.1%	0.26 [0.10, 0.67]
Steroids SARI 2020	13	24	13	23	4.6%	0.91 [0.29, 2.87]
Tang 2021	0	43	1	43	1.4%	0.33 [0.01, 8.22]
Tomazini 2020	85	151	91	148	6.3%	0.81 [0.51, 1.28]
Villar et al 2020 (DEXA-Covid 19)	2	7	2	12	2.4%	2.00 [0.21, 18.69]
Total (95% CI)		**4018**		**5904**	**100.0%**	**0.52 [0.34, 0.80]**
Total events	1345		1935			

Heterogeneity: Tau² = 0.72; Chi² = 171.57, df = 20 (P < 0.00001); I² = 88%
Test for overall effect: Z = 2.99 (P = 0.003)

Fig. 2. Pooled analysis results using a random effect model (forest plot).

Results: Methylprednisolone

Subgroup analysis for methylprednisolone has shown a significant reduction in deaths of COVID-19 patients as compared to the non-steroidal group.

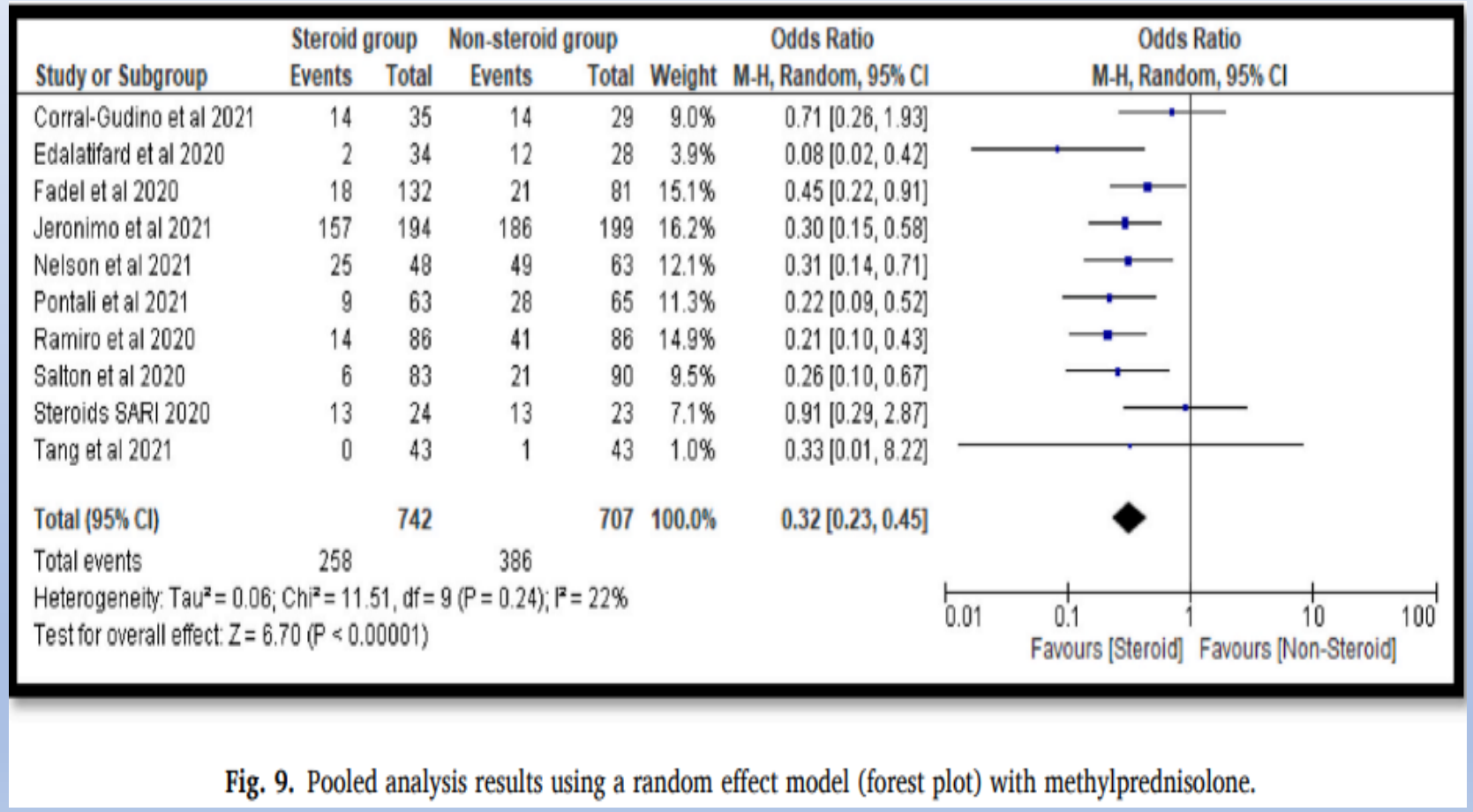


Fig. 9. Pooled analysis results using a random effect model (forest plot) with methylprednisolone.

Results: Dexamethasone and Hydrocortisone

More clinical evidence is required for dexamethasone and hydrocortisone.

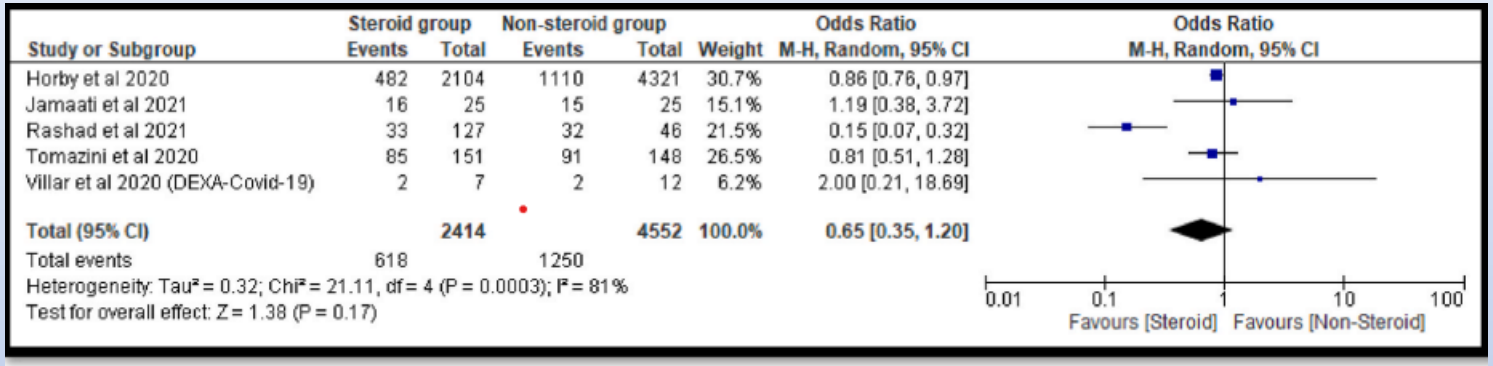


Fig. 7. Pooled analysis results using a random effect model (forest plot) with dexamethasone.

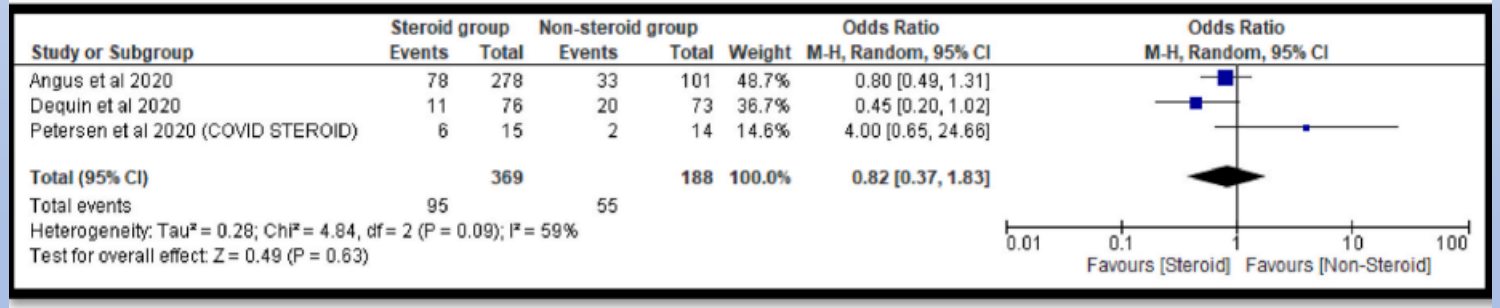


Fig. 8. Pooled analysis results using a random effect model (forest plot) with hydrocortisone.

OXFORD

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Original paper

ORIGINAL PAPER

Steroids use in non-oxygen requiring COVID-19 patients: a systematic review and meta-analysis

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Seven studies which fit the criteria (involving 2214 non-oxygen requiring COVID 19 patients) were included and analyses.

- Mean duration of fever (7.4 days), duration to viral clearance (18.9 days), and length of hospital stay (20.8 days) were significantly higher in the steroid arm, as compared to that in no-steroid arm (6.7 days, 16.5 days, 15.2 days respectively)

- Overall odds of progression to severe disease among the non-oxygen requiring COVID-19 patients receiving steroids was 5.97 (95%CI: 1.27-27.99, I 2 - 0%) and odds of death (OR: 1.35, 95%CI: 1.01-1.79; I 2-0%) as compared to the patients not receiving steroids.

Steroids in non-oxygen requiring COVID-19 patients can be more **detrimental** than beneficial.

Anticogulation

Contents lists available at ScienceDirect

Thrombosis Research

journal homepage: www.elsevier.com/locate/thromres

Anticoagulation in COVID-19 patients – An updated systematic review and meta-analysis

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ARTICLE INFO

Keywords:
Systematic review
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Bleeding

ABSTRACT

Background: Thromboembolic events are common complications of COVID-19. Clinical study results on safety and efficacy of anticoagulation in COVID-19 are controversial.
Material and methods: This report updates our systematic review and random-effects meta-analysis on randomized controlled trials (RCTs) comparing standard prophylactic anticoagulation and intermediate or therapeutic anticoagulation in COVID-19 patients. We searched eligible studies for the update up to 4 February 2022 by weekly monitoring of RCTs in the Cochrane COVID-19 Study Register. Certainty of evidence was assessed using GRADE (Grading of Recommendations Assessment, Development and Evaluation).
Results: For this update we included five new trials; a total of 13 RCTs with 7364 patients. Certainty of evidence was very low to low. We are uncertain whether low-dose prophylactic anticoagulation is favoured over placebo or no anticoagulation in the outpatient- or post-discharge-setting. In hospitalized patients with moderate and severe COVID-19, intermediate-dose anticoagulation may have little or no effect on thrombotic events or death (RR 1.03, 95 % CI 0.86–1.24), but may increase severe bleeding non-significantly (RR 1.48, 95 % CI 0.53–4.15). Therapeutic-dose anticoagulation may decrease thrombotic events or deaths in hospitalized patients with moderate COVID-19 (RR 0.64, 95 % CI 0.38–1.07; fixed-effect model RR 0.72, 95 % CI 0.57–0.91), but may have little or no effect in patients with severe disease (RR 0.98, 95 % CI 0.86–1.12). With therapeutic-dose anticoagulation, the risk of major bleeding may increase regardless of COVID-19 severity (RR 1.78, 95 % CI 1.15–2.74).
Conclusions: Hospitalized, moderately ill COVID-19 patients may benefit from therapeutic-dose anticoagulation, while critically ill patients may not. Risk of major bleeding must be considered.

Methods

- Systematic review and random-effects meta-analysis on randomized controlled trials comparing standard prophylactic anticoagulation and intermediate or therapeutic anticoagulation in COVID-19 patients.
- Eligible studies up to 4 February 2022 by weekly monitoring of RCTs in the Cochrane COVID-19 Study Register.

Results

- Uncertain whether low-dose prophylactic anticoagulation is favored over placebo or no anticoagulation in the outpatient- or post-discharge-setting.

- In hospitalized patients with moderate and severe COVID-19, intermediate-dose anticoagulation may have little or no effect on thrombotic events or death (RR 1.03, 95 % CI 0.86–1.24), but may increase severe bleeding non-significantly (RR 1.48, 95 % CI 0.53–4.15).

Results

- Therapeutic-dose anticoagulation may decrease thrombotic events or deaths in hospitalized patients with moderate COVID-19 (RR 0.64, 95 % CI 0.38–1.07; fixed-effect model RR 0.72, 95 % CI 0.57–0.91), **but may have little or no effect in patients with severe disease (RR 0.98, 95 % CI 0.86–1.12).**

- Risk of major bleeding must be considered 2ith therapeutic-dose anticoagulation, the risk of major bleeding may increase regardless of COVID-19 severity (RR 1.78, 95 % CI 1.15–2.74).

Hospitalized, moderately ill COVID-19 patients may benefit from therapeutic-dose anticoagulation, while critically ill patients may not.

Antibiotics

COVID-SGHUMC

- In the study period from March 2020 till March 2022, a total of 947 COVID-19 patients were admitted to SCHUMC.
- 33.9% females and 66.1% males. Average age was 59.8±18.7 years old
- The median for length of stay of these patients was 8 days with males (Me= 8 days) staying longer than females (Me=7 days) in average (p-value= 0.007).
- Total patient days of COVID-19 patients was 11582 COVID-Days (CPD) from a total of 85966 PD, 13.5% of all patient days during the study period.

- We collected a total of 670 cultures belonging to 332 patients in the period from March 2020 till March 2022.

- COVID-19 patients who had positive cultures were 166/947 (17.5%) of all patients with COVID who were admitted to the hospital during the study period.

- COVID-19 patients who had positive cultures had a median LOS of 17 (Q1-Q3= 9-28), those who did not have positive cultures had a median LOS= 7 (Q1-Q3=4-12), the difference between the LOS in patients with and without positive cultures was statistically significant (p-value<0.001).

Pathogen	All isolates, % of corresponding isolates	% of all isolates (n=473) (/1000CPD)	BSI (1 per patient)
Carbapenem Resistance			
Escherichia coli	6/107= 5.6%	1.3% (0.52/1000CPD)	1 (0.1/1000CPD)
Klebsiella pneumoniae	4/83= 4.8%	0.8% (0.35/1000CPD)	0
Klebsiella aerogenes	0	0	0
Enterobacter cloacae	9/25= 36%	1.9% (0.77/1000CPD)	2 (0.17/1000CPD)
CRE	6+4+9= 19/247= 7.7%	4.02% (1.64/1000CPD)	3 (0.26/1000CPD)
Pseudomonas aeruginosa	24/76= 31.6%	5.1% (2.07/1000CPD)	2 (0.17/1000CPD)
Acinetobacter baumannii	5 isolates 100%	1.1% (0.43/1000CPD)	0
All Gram-negative	87/367 23.7%	18.4% (7.34/1000CPD)	7 (0.6/1000CPD)

Pathogen	All isolates, % of corresponding isolates	% of all isolates (n=473) (/1000CPD)	BSI (1 per patient)
Vancomycin-resistant Enterococcus	3/9= 33.3%	0.6% (0.26/1000CPD)	2 (0.17/1000CPD)
Methicillin-resistant Staphylococcus aureus	35.7%	1.3% (0.51/1000CPD)	3 (0.26/1000CPD)
Clostridium difficile	10.9% positive tests 15.3% out of COVID-19 patients (2.5 COVID-19 and C.diff positivity /1000CPD)		

Fauci: Yeah — I could say, well, hey, we tried our best, and we still got screwed, so we're going to get screwed no matter what happens in the next one. I don't think that's an appropriate response. I think we can still improve significantly. And I put it into two general buckets. First, the scientific preparedness and response, and then the public-health preparedness and response.