Table A2: Brief Summaries of Original Research (in vitro research is included in Table A1) (47 entries)					
1st Author /Location	Title (Truncated)	Number of Participants /Type*/ #pages	Supporting Information**	Results/ Recommendation Regarding Covid-19	Support for Supplementation Now
Ahmed/ UK	First Covid-19 maternal mortality …thrombotic complications(1)	1/CS 4 pages	T	Thrombosis kills/ Vigilance is needed	5
Alipio/ Philippines	Vitamin D … possibly improve clinical outcomes of patients infected with … (Covid-2019)(2)	212/R 6 pages	R,C	Sig. D-outcome link /D suppl. could improve outcomes	8
Alipio/ Philippines	Do latitude and ozone concentration predict Covid-2019 cases in 34 countries?(3)	34 countries /A 9 pages	R,	Sig Covid-19-UV (D) link, no latitude link /D suppl. indicated	7
Annweiler/France & China	Point of view: Should COVID-19 patients be supplemented with vitamin D?(4)	6 of 7 causal criteria/C 25 pages	G,P,R,F,C,J,S	Strong biological plausibility case - supplement D	9
Asyary/ Indonesia	Sunlight exposure increased Covid-19 recovery rates: A study in … Indonesia(5)	9 hospitals /R 4 pages	G,I,R,F,	Patient exposure to sunshine helped Encourage it	7
Bäcker/ USA (see note)	Why COVID-19 May Be Disproportionately Killing African Americans…Irradiance…Income(6)	8 locations in the USA/ A 6 pages	G,I	Irradiation for disinfection, sun for protection	6
Bäcker/ USA (see note)	Slower COVID-19 morbidity and mortality growth at higher solar irradiance and elevation(7)	159 locations/A 21 pages	G,I,	Encourage people to go where the sun is overhead	6
ann/ USA (see note)	Non-black Hispanic/Latinos Spend More Time Outdoors … Lower … Morbidity Than Non-Hispanic…(8)	All of Georgia /A 7 pages	G,I,P	Urgently test sunlight exposure, especially for African Americans	6
Bäcker/ USA	Double COVID-19 … Fatality Rate in Countries with High Elderly Female Vitamin D Deficiency Prevalence(9)	32 countries /A 11 pages 1	G,I,P,C,S	Test Vitamin D for prevention and treatment	6

Bossoni/ Italy	Severe hypocalcemia in a thyroidectomized woman with Covid-19 infection(10)	1/CS 2 pages	R	Warn thyroid patients due to home confinement	8
Braiman/ USA	Latitude … COVID-19 mortality rate—a possible relationship to vitamin D deficiency?(11)	all nations (WHO data) P/ 14 pages	G	Test for link by supplementing and looking for changes	7
Cuñat/ Spain	Vitamin D deficiency in critically ill patients … COVID -19. Are we doing enough? … 226 patients.(12)	226 patients (subset: 17) /R/7 pages	P,R,C,S	Should assess D more often – all 17 were deficient	8
Daneshkhah/USA	The Possible Role of Vitamin D in Suppressing Cytokine Storm and … Mortality in COVID-19 Patients(13)	10 countries /A/ 23 pages	C	Study if Vitamin D deficiency speeds mortality	6
Darling /UK	Vitamin D status, body mass index, ethnicity and COVID-19: … UK Biobank COVID-19 …(n 580) … negative controls (n 723)(14)	580 Covid+ vs 580 negative /R 3 pages	None mentioned	All identified risk factors are uncontrollable - No recommendations	0
Davies/UK Switzerland	Evidence Supports a Causal Model for Vitamin D in COVID-19 Outcomes(15) (two studies)	Global data /A and C/ 30 pages	G,P,R	D deficiency is a cause of Covid-19 Give up to 4000IU	9
D'Avolio/ Switzerland, Italy	25-Hydroxyvitamin D ..Are Lower in Patients with Positive PCR for SARS-CoV-2(16)	107 Covid+ vs 1377 /R/ 7 pages	R	D correlated to + Supplements urged as per Grant, et al.	9
De Smet/ Belgium	Vitamin D deficiency as risk factor for severe 1 COVID-19: a convergence of two pandemics(17)	186 Covid+ vs 2717 /R/ 23 pages	D,P,R,C,	Deficiency seems to cause severe, supplements urged	9
Fasano/ Italy, Canada	COVID-19 in Parkinson's Disease Patients Living in … Italy(18)	105 Covid+ vs 1381/S/ 12 pages	G,C	Parkinson's doesn't matter; D does. Conduct D studies	7
Faul/ Ireland	Vitamin D Deficiency and ARDS after SARS-CoV-2 Infection(19)	33 Covid+ S/ 2 pages	D,C	Worse outcomes in men with lower D	7

Fox/ USA	No Association …Between Vitamin D Deficiency and COVID-19 Infection, Hospitalization, or Mortality(20)	28,185 patients 3 pages	None mentioned	No difference with deficiency, but authors call for better studies	0
Ghasemian/ Iran, Australia, Russia,	The Role of Vitamin D in The Age of COVID-19: A Systematic Review and Meta-Analysis Along with an Ecological Approach(21)	9 studies (subset:6) 51 countries 20 pages	G,P,R,C,	Patients with Covid-19 lacked D, slight country link Need RCTs	6
Glicio/ India	Vitamin D Level of Mild and Severe Elderly Cases of COVID-19…(22)	176 Covid+ 18 pages	P,R,C,	Link is suggested Supplement elderly	6
Hastie/ UK	Vitamin D concentrations and COVID-19 infection in UK Biobank(23)	449 Covid+ vs 348,149 R/5 pages	G,P,	Link attributed to confounds – D has no role in Covid-19	0
Horowitz/ USA	Efficacy of glutathione ..dyspnea … COVID-19 pneumonia … 2 cases(24)	2 (1 D) 8 pages	None mentioned	One patient had D deficiency	5
Ilie/UK	The role of vitamin D in the prevention of coronavirus disease 2019 infection and mortality(25)	20 countries /P/ 4 pages	D,G,P,R,C,S	Recommend study comparing D levels & Covid-19 severity	6
Kara/Italy,Turkey, Taiwan	'Scientific Strabismus' or Two Related Pandemics COVID-19 & Vitamin D Deficiency(26)	40 countries /P/ 6 pages	D,G,P,R,S	Goal 40-60ng/ml 10,000IU/day x1mo then 5000IU/day	10
Kohlmeier/ USA	Avoidance of vitamin D deficiency to slow the COVID-19 pandemic(27)	22 states/A/ 7 pages	D,G,P,R,C	Precision nutrition RDA - <4000IU/Day	8
Kumar/ India	Spurious Correlation? A review of the relationship … Vitamin D and Covid-19 infection & mortality(28)	20 countries /P/ 7 pages	None mentioned	Ilie is wrong – no role for vitamin D Overdose is likely	0
Laird/ UK, Ireland	Vitamin D and Inflammation: Potential	12 countries /P/	D,P,G,R,C,S	Correlation exists Publicize D	6

	Implications for Severity of Covid-19(29)	7 pages		recommendations	
Lau/USA	Vitamin D insufficiency is prevalent in severe COVID-19(30)	20 Covid+ R/14 pages	G,P,R,C,T	Worse with low D Study D further	6
Li/ China, USA	Identifying novel factors … COVID-19 using …machine learning(31)	A (machine) 32 pages	Not discussed	D is independent risk factor for cases	7
Li/USA	Multivariate Analysis of Factors Affecting COVID-19 …U.S. Counties: …Black Race and Temperature(32)	661 & 217 counties A/ 21 pages	D,P,R,C	D is a likely factor Conducting studies Supplement all	7
Li/USA, China	Sunlight and vitamin D in … (COVID-19) infection and mortality …(33)	49 states A/ 15 pages	D,G,P,R,C,	Appears related Need more studies	6
Marik/ USA	Does vitamin D status impact mortality from SARS-CoV-2 …?(34)	50 states A/ 2 pages	G,P,R,C	Appears related Standard dosages	6
Meltzer/ USA	Association of Vitamin D Deficiency … Treatment with COVID-19 …(35)	499 patients R/ 22 pages	D,G,P,R,C	D decreases risk 4000-5000IU/day	10
Moozhipurath/ Germany	Evidence of Protective Role of Ultraviolet-B (UVB) Radiation in Reducing COVID-19 Deaths(36)	152 affected countries/A/ 42 pages	R,C,F	D decreases deaths Encourage time in sun for deficient	6
Notari/ Spain, Brazil	COVID-19 transmission risk factors(37)	126 countries, 24 factors A/ 42 pages	R	Independent risk: Type 1 diabetes, BCG vaccination, and vitamin D	7
Panarese/ Italy	Letter: Covid-19, and vitamin D (response to Tian, et al. Gastro)(38)	108countries A/3 pages	G,P,R,C,S	Immune control 2000IU/day	8
Pinzon/ Indonesia	Vitamin D Deficiency … Patients with COVID-19 : Case Series and Recent Literature Review(39)	10 patients CS 9 pages	D,G,P,R,C	Immune benefits They give all patients 2000IU	8
Raharusuna/ Indonesia	Patterns of COVID-19 Mortality and Vitamin D: An Indonesian Study(40)	780 patients R 14 pages	R,C	D is strongly associated with death – do RCTs	8

Raisi-Estabragh/ UK	Greater risk of severe COVID-19 in non-White ethnicities is not explained by …vitamin D status: study of 1,326 … UK Biobank(41)	Hospitalized 1326 + 3184 - R/ 21 pages	Not discussed	Ruled out cardio-metabolic, social, behavior, and D – leaving genetic?	0
Rhodes/ UK	Editorial: low population mortality …south of latitude 35 degrees North supports vitamin D …(42)	120 countries A/ 4 pages	D,P,C,	Could protect from cytokine storm 1000IU/day	7
Singh/ India	Revisiting the role of vitamin D … prevention and mortality in European …post peak(43)	20 countries 2 dates A/ 8 pages	R,C,S	D influenced cases more than deaths study ? of giving D	3
Skutsch/Netherlands, Mexico, Germany	The association of UV with rates of COVID-19 transmission and deaths in Mexico: the possible mediating role of vitamin D(44)	45 cities in Mexico A/ 29 pages	D,P,R,C,	Further study of link between UV (vitamin D) and transmission rates	6
Sun/ China	Serum calcium as a biomarker of clinical severity and prognosis…(45)	241 patients P/18 pages	not discussed	Deficiency suggests larger studies	7
Tan/ Singapore	A cohort study to evaluate the effect of combination Vitamin D, Magnesium and Vitamin B12 (DMB) on progression to severe outcome in older COVID-19 patients(46)	43 patients 26 controls 17 supplement R/ 6 pages	R,C	Give combination earlier to all cases and to high risk contacts	9
Yao/ China	No Association of COVID-19 transmission with temperature or UV radiation in Chinese cities(47)	224 cities in China/ G/ 9 pages	G,R	UV (therefore D) not related to transmission	0

*Type of Study

A = Analyses of population data or latitude data (geographic)

C = Causal inference modeling report, Hill's methodology for exploring causality, etc.

P = Prospective correlational study

R = Retrospective chart (or data) review

CS = Single or Multiple Case Study

** Supporting Information provided by these authors:
G = geographical observations (not research) of relationship between low vitamin D and high Covid-19
I = Irradiance in the geographic area influences vitamin D deficiency
Biological plausibility:
R = vitamin D enhances resistance to respiratory viruses, decreasing incidence of infection
F = vitamin D decreases overall fatalities from respiratory viruses
C = vitamin D suppresses cytokines that are implicated in severe Covid-19
J = vitamin D tightens junctions, helping prevent viral infections from progressing to pneumonia
T = vitamin D decreases the risk of thrombosis
S = vitamin D suppresses the 'Renin-Angiotensin' System activity, which is more of a problem for males

Note: Content from an earlier preprint by Bäcker, Follow the Sun: Slower COVID-19 morbidity and mortality growth at higher irradiances, https://ssrn.com/abstract=3567587, last revised 13 April 2020, appears to have been divided into the two much more complete and more recently revised articles included here in Table 3. Similarly, Bäcker's preprint, Non-black Latinos Spend More Time Outdoors and Have Lower COVID-19 Morbidity and Case Fatality Rates Than Non-Latinos, last revised April 16, appears to have been completely incorporated into a similar work, Non-black Hispanic/Latinos Spend More Time Outdoors and Have Lower COVID-19 Morbidity Than Non-Hispanic/Latinos, Last revised April 20, 2020.

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