

I sent this email to the WHO's Strategic and Technical Advisory Group for Infectious Hazards (STAG-IH) and to other doctors and specialists on 22 and 23 March 2020

Subject: COVID-19: NSAIDs; Vitamin D, Omega 3 fatty acids, boron etc.

From: Robin Whittle <rw@firstpr.com.au>

Dear . . . ,

I hope these ideas will be of interest to you and your colleagues. I would really appreciate your feedback, but I know you are busy.

I plan to write messages such as this to a number of clinicians and researchers, and publish updated versions of this material at <http://aminotheory.com/cv19/> with suitable disclaimers.

Most people's battle against the virus will be lost or won at home, not in hospitals or doctors' clinics. Zhou et al. (below) report that of 34 patients receiving invasive mechanical ventilation or ECMO, only 1 survived. The survival rate for non-invasive ventilation was 2/26 and for nasal breathing support, 8/41. Antivirals and antibiotics help, but we will soon run out of these. Coronavirus home remedies are the only substantial improvement we can make on what promises to be a disastrous situation, given doubling times of half a week, and the impossibility of retaining sufficient social distancing for 6 months or more.

The public needs clear guidance on nutritional steps to minimise the cytokine storm - sepsis - which drives pneumonia and organ failure. Before discussing readily available foods and supplements for this, here are my suggestions for how the WHO and clinicians might provide clear guidance regarding NSAIDs and paracetamol:

1. Fever is an important part of the body's defense against viral and bacterial infections. Except when fever becomes dangerous (you need to specify temperature and other conditions) it is best to allow the fever to continue, by rugging up and avoiding the use of aspirin, ibuprofen, paracetamol or other such drugs. Dr John Campbell provides a good explanation: <https://www.youtube.com/watch?v=gJqSdmNNwW4> .
2. Aspirin contributed enormously to the Spanish Flu death toll, especially among young adults: <https://academic.oup.com/cid/article/49/9/1405/301441> . Even though these deaths resulted from larger doses than might, ideally, be used today, most people will be forced to self-medicate their COVID-19 fever and breathing difficulties at home - and most people think that fever is bad and must be suppressed.

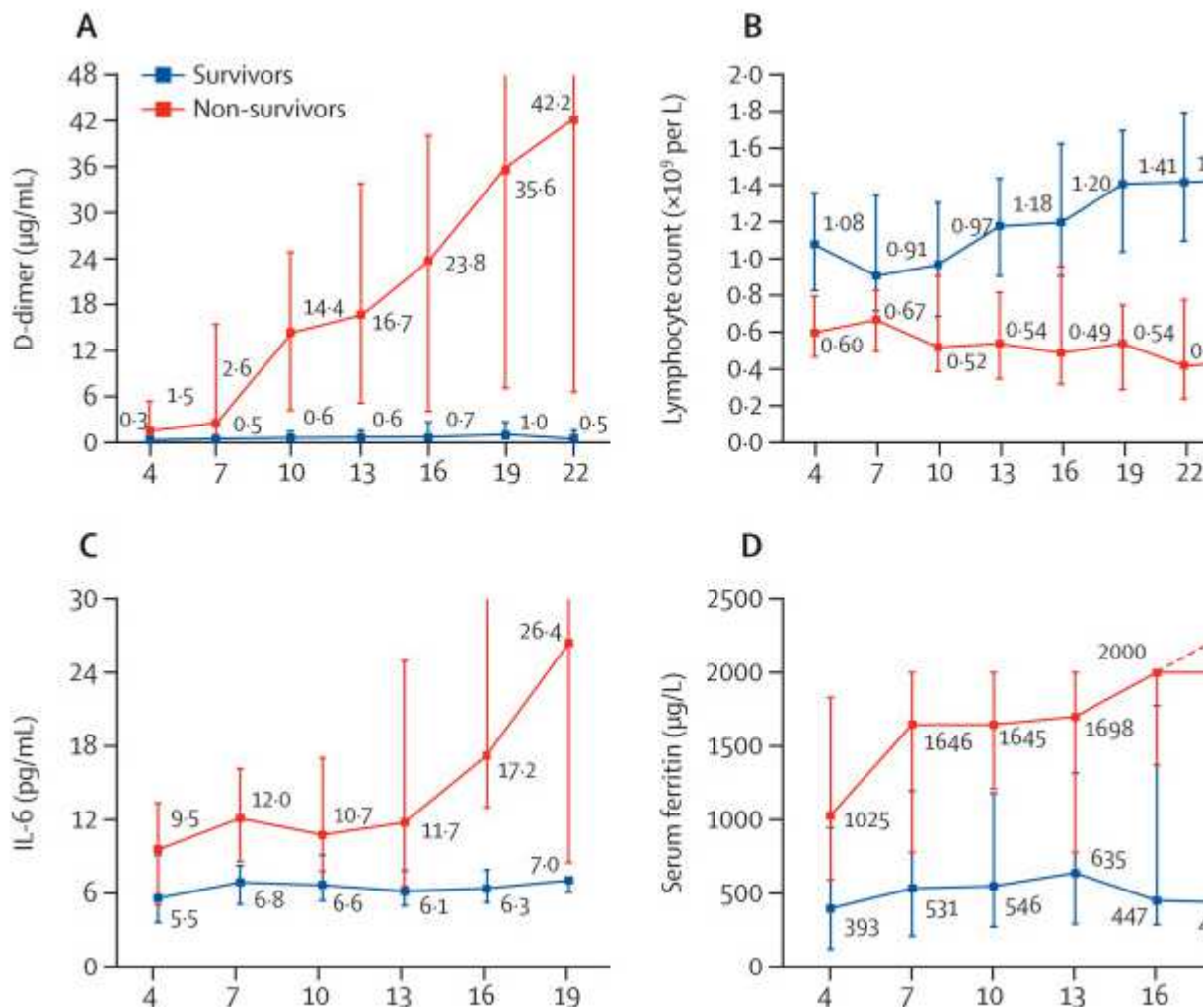
Perhaps this means that clinicians should advise people not to use aspirin at all with COVID-19 or the flu.

Also: <https://ndnr.com/nature-cure/a-century-after-the-spanish-flu/> "*the average mortality of influenza patients treated by homeopathic physicians was*

actually only about one-thirtieth of the average mortality reported by all physicians." – Dr William A. Pearson, 1919 "The German aspirin has killed more people than the German bullets have." – Dr C. J. Loizeaux, Des Moines, ID, 1919.

3. The current lack of clear advice to the public regarding ibuprofen and paracetamol (with little mention of aspirin) is a failure which must be rectified immediately. Beyond the concerns about reducing fever, this report is extremely concerning and I hope you will be able to find out more about it: <https://www.bmj.com/content/368/bmj.m1086> "(An infectious diseases doctor in south west France) is reported to have cited four cases of young patients with covid-19 and no underlying health problems who went on to develop serious symptoms after using non-steroidal anti-inflammatory drugs (NSAIDs) in the early stage of their symptoms.". The English translation of a recent French directive: <https://dgs-urgent.sante.gouv.fr/dgsurgent/inter/detailsMessageBuilder.do?id=30500&cmd=visualiserMessage> in includes: "paracetamol, without exceeding the dose of 60 mg / kg / day and 3 g / day. NSAIDs should be banned."
4. I am concerned about millions of people taking paracetamol at home while their symptoms increase, with impaired liver function from IL-6-driven sepsis leading to high levels of NAPQI and so potentially deadly liver and/or kidney damage. If paracetamol is recommended, I suggest you specify a maximum dose.

The cytokine storm, lead by IL-6 , is the primary or sole cause of death - and probably of pneumonia and so most hospital admissions. The graphs in Zhou et al. [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(20\)30566-3/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)30566-3/fulltext)



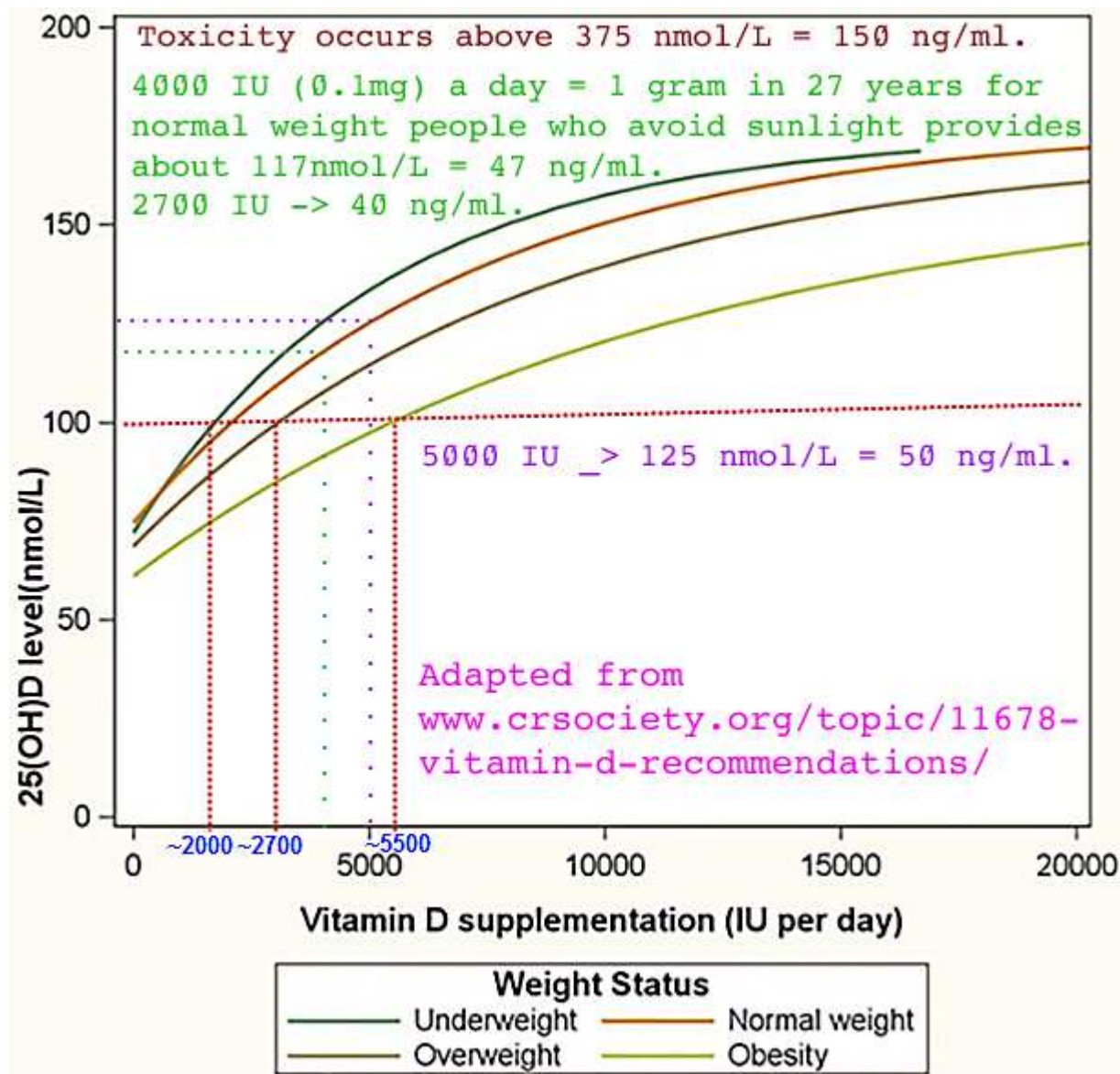
show that those who survived usually did so without radically elevated IL-6 levels, and that those whose IL-6 levels kept on rising died. Thrombosis (D-dimer) increased progressively in those who died, but not in survivors. These averages are extremely divergent. Serum ferritin kept rising in those who died, indicating not iron overload, but (<https://www.bmj.com/content/351/bmj.h3692.full>) excessive inflammation.

The real enemy with COVID-19 is not the virus itself, but the excessive and inappropriate inflammatory response to it - the same thing which drives sepsis, neurodegeneration (Alzheimers, Parkinsons), osteoporosis, diabetes etc. One probable cause of this is that some aspects of our immune system are far more aggressive than they should be, due to them evolving in the presence of ubiquitous infection with intestinal parasites and/or H. pylori, both which attenuate these mechanisms. However, now is not the time for helminthic therapy.

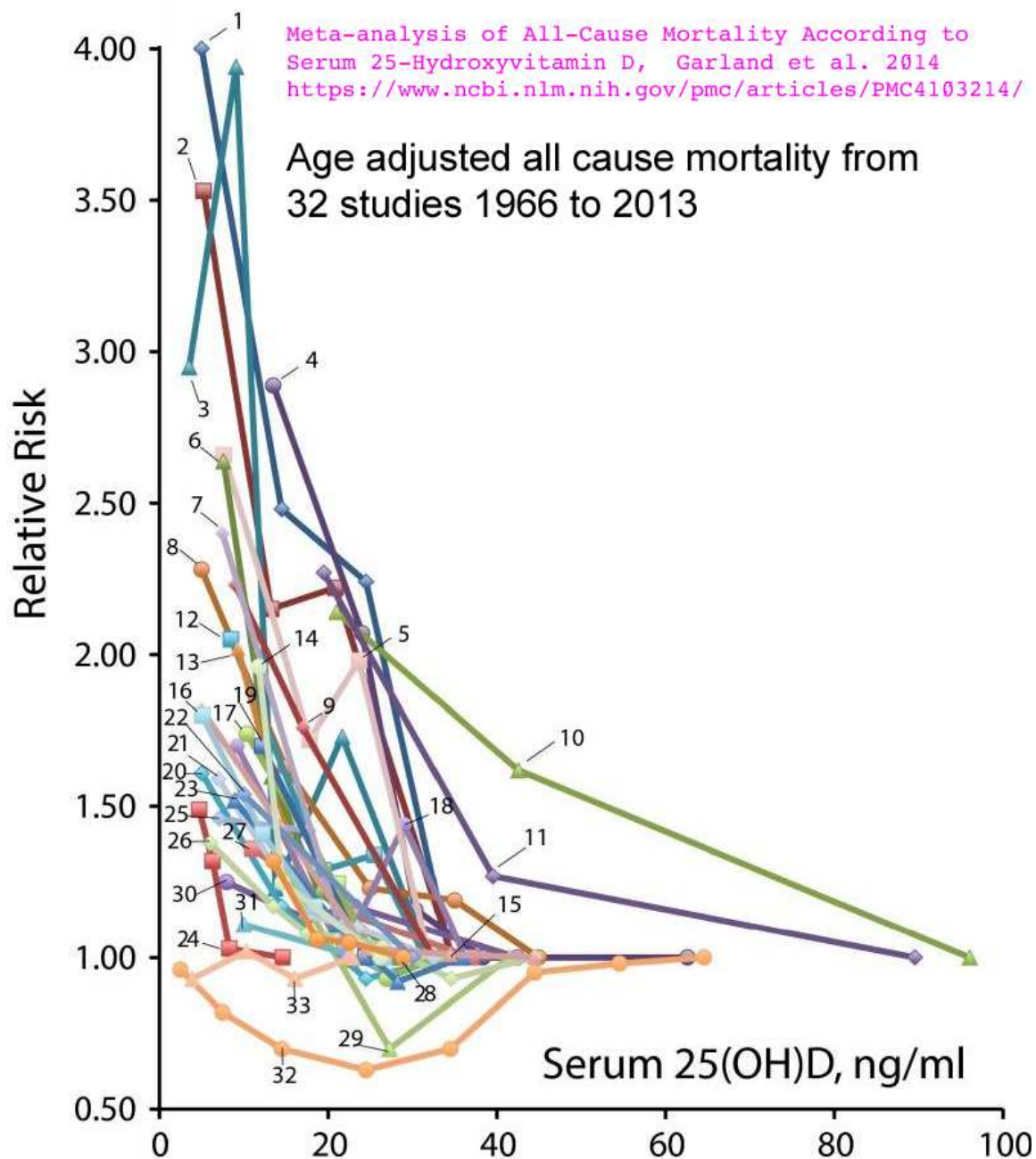
Another set of causes, which can be fixed - and must be fixed in the next few weeks in order to prevent millions of deaths - are nutritional deficiencies, particularly in vitamin D, boron, omega 3 PUFAs and probably other nutrients such as vitamin C. For brevity I state the following arguments as if they were facts.

A Canadian graph (<https://www.crsociety.org/topic/11678-vitamin-d-recommendations/>) relates blood levels to D3 supplement quantities for underweight, normal, overweight and obese people. For normal weight people, 4000IU/d provides 117 nmol/L, which is 47 ng/ml. Toxicity

(<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6158375/>) occurs with blood levels more than three times this.



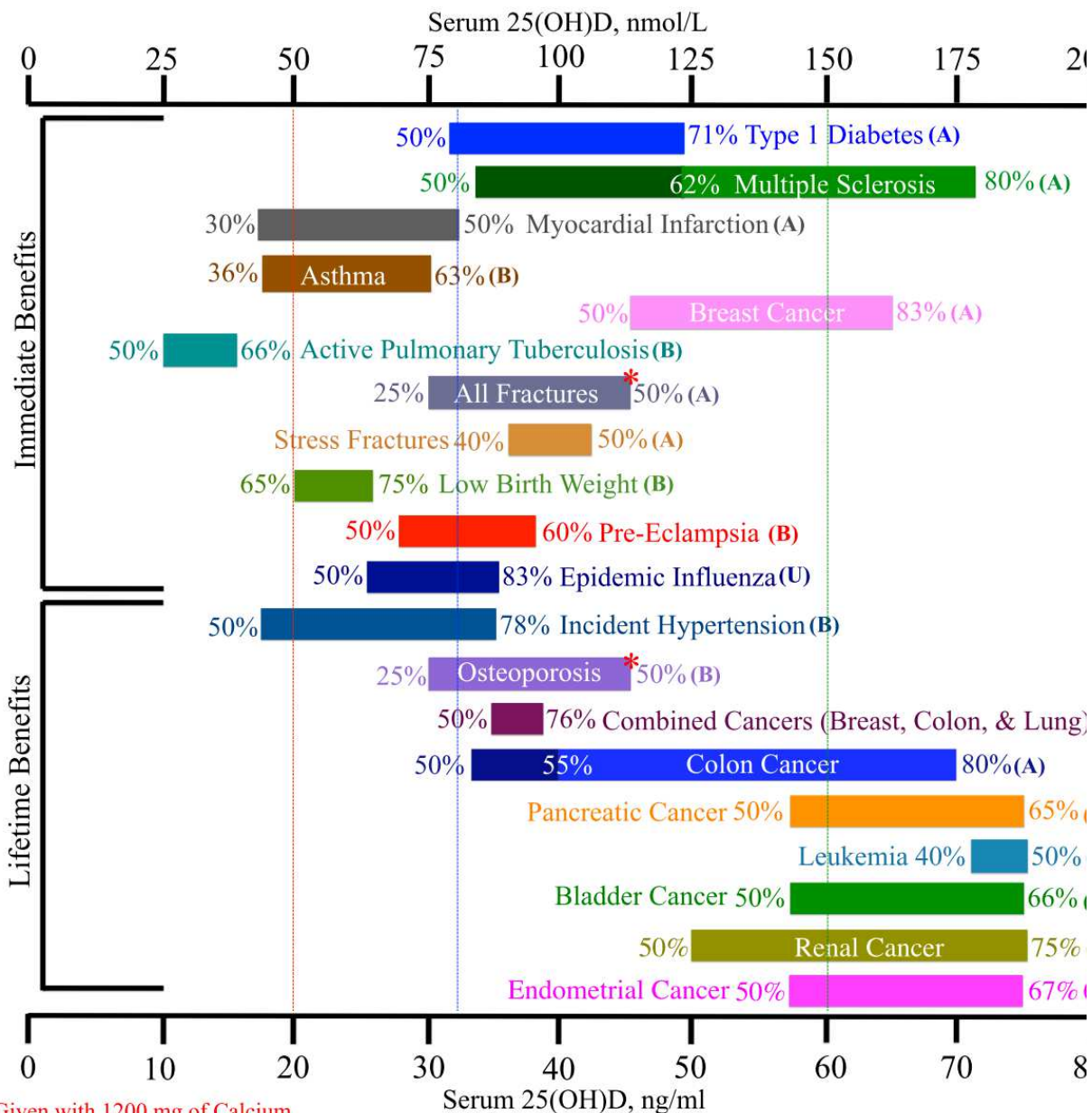
If all adults (who wisely have little UVB exposure) took 4000IU vitamin D3 a day (a gram every 27 years) then they would avoid most of the diseases caused by vitamin D deficiency. This chart from Garland et al. 2014 (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4103214/>) shows the importance of achieving at least 40ng/ml.



A chart from one of the co-authors, (<https://vitamindwiki.com/Chart%20of%20Vitamin%20D%20levels%20vs%20disease%20-%20Grassroots%20Heal>) labels the various conditions:

Vitamin D Would Help Reduce the Incidence of Disease of Major Public Health Importance

List of diseases that can be prevented in all or part by adequate vitamin D status, showing potential percentage preventable according to serum 25(OH)D concentration. There are no known adverse effects of serum 25(OH)D at concentrations for nearly everyone. Estimated percentage reductions are relative to the lowest quintile of serum 25(OH)D, generally 10 ng/ml or 25 nmol/L.



*Given with 1200 mg of Calcium

Abbreviations: A. Cohort-based, B. Case-control, R. Randomized controlled trial, U. Ultraviolet B-based study
 Gorham E, et al. 2011 October 19. [Submitted for Publication]; Munger KL, et al. JAMA 2006 296:2832-8; Giovannucci E, et al. Arch Intern Med 2008 Jun 9 168(11):1174-80; Gupta A, et al. Am J Respir Crit Care Med 2011 Sep 15. [Epub ahead of print]; Lowe LC, et al. Eur J Cancer. 2005 41(8):1164-9; Davies PD, et al. Thorax. 1985 Mar 40(3):187-90; Bischoff-Ferrari HA, et al. JAMA. 2005 May 11 293(18):2257-64; Burgi AA, et al. Bone Miner Res. 2011 Oct 26(10):2371-7; Robinson C, et al. Am J Obstet Gynecol. 2011 Jun;204(6):556.e1-4; Robinson C, et al. Am J Obstet Gynecol. 2010 Oct;203(4):366.e1-6; Cannell JJ, et al. Epidemiol Infect. 2006 Dec 134(6):1129-40; Forman JP, et al. Hypertension. 2007 May 49 1063-9; Holick MF, Drugs Aging. 2007 24(12):1017-29; Lappe JM, et al. Am J Clin Nutr. 2007 Jun 85(6):1586-91; Gorham ED, et al. Am J Prev Med 2007 Mar 32(3):210-6; Mohr S, et al. Am J Prev Med. 2010 Mar 38(3):296-302; Mohr SB, et al. Am J Prev Med. 2011 Jul 41(1):68-74; Mohr SB, et al. Pancreas. 2010 Jul 39(5):669-74; Mohr S, et al. Int J Cancer. 2006 Dec 1 119(11):2705-9; Mohr SB, et al. Prev Med. 2007 Nov 45(5):327-31;

Note: Light shading denotes extrapolated estimate. Credits: Baggerly C, Gorham E, Kim J, Mohr S, Garland C. (To be submitted for publication)

Numerous peer-reviewed journal articles showing adequate vitamin D reduces inflammation AKA sepsis can be found at:

<https://vitamindwiki.com/Inflammation>

<https://vitamindwiki.com/Vitamin+D+reduces+sepsis>

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4070857/> (Vitamin D and inflammatory diseases, 2014. Google reports 227 citations.)

The same is true of omega 3 fatty acids. I believe that if the WHO et al. recommended adults take 2 grams of fish oil a day and 4000IU vitamin D3, that this - to the extent that people were willing and able to comply - would significantly reduce disease severity and death for hundreds of millions of people, especially those with a Western, indoor, lifestyle.

<https://openheart.bmj.com/content/5/2/e000946> (Importance of maintaining a low omega-6/omega-3 ratio for reducing inflammation, 2014.)

A systematic review of 26 randomised controlled trials (RCTs) concluded, 'Dietary omega-3 fatty acids are associated with plasma biomarker levels, reflecting lower levels of inflammation and endothelial activation in cardiovascular disease and other chronic and acute diseases, including chronic renal disease, sepsis and acute pancreatitis'.

Indeed, supplementing with fish oil is known to inhibit inflammatory cytokines such as TNF-alpha and IL-1 beta and proinflammatory/proaggregatory eicosanoids such as thromboxane-2 and prostaglandin E2.

<https://www.sciencedaily.com/releases/2017/08/170823093831.htm> (Understanding how omega-3 dampens inflammatory reactions, 2017.)

It may be best to recommend zinc supplements, since Zn⁺⁺ inhibits viral RNA synthesis - including zinc lozenges to slow the initial infection in the throat, before it gets into the lungs.

I suggest you recommend a substantial but safe level of vitamin C oral supplementation, since it is known to reduce respiratory infections and to reduce sepsis when used intravenously. A vet reports IV vitamin C is routinely used for saving animals from sepsis (<https://medium.com/@anmldoc/i-really-do-not-know-why-the-medical-community-is-recommending-that-if-folks-get-sick-with-d657e669e749>). She cites Paul Marik MD (https://www.pilotonline.com/news/health/article_7a3063e5-24cf-56c1-b25c-142731604196.html) who uses IV vitamin C and hydrocortisone with success against sepsis in humans.

In this section I want to raise your awareness of **boron** as an essential nutrient which could save hundred of millions of people from sepsis-induced illness and death with COVID-19. Please take a look at a recent review article:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4712861/> (**Nothing Boring about Boron**, 2015)

and the work of long-time US Department of Agriculture boron researcher, Forrest Nielsen, such as:

https://www.researchgate.net/publication/254082639_Growing_Evidence_for_Human_Health_Benefits_of_Boron
(2011, cited by 60.)

<https://scholar.google.com/scholar?q=Forrest+Nielsen+boron>

It is a scandal that boron is not officially recognised as an essential nutrient. Most people turn their noses up at the thought. The word sounds like "boring" and rhymes with "moron". They know borax is used in laundry, as a welding flux, as an ant and cockroach poison and in children's slime. The naturally pure mineral borax - sodium tetraborate - is mined at large scale in Turkey California, and then refined into the bright crystals sold in supermarkets. USP boron is used in nutritional supplements and medication, but it is difficult to obtain at a retail level.

If a drug company found a patentable compound with boron's health benefits and safety profile - including especially its ability to restrain the body's overactive, sepsis-causing, inflammatory response - then we would all be singing its praises and paying top dollar for it.

Borax, 100mg a day, in water solution, provides 11.36mg boron a day, and I believe this will significantly reduce the inflammation which is killing COVID-19 patients. (I have a box of journal articles on boron, and no time now to write up an annotated bibliography of boron nutrition.)

Laundry borax is available by the kilogram in most supermarkets. My wife Tina and I use this - plain laundry borax is plenty pure enough. We use:

<https://www.blants.com.au/product/natural-pure-borax-900g/> . Our 12mg boron a day greatly improves on the typical 1mg a day in the average diet, and is well within the tolerable maximum of 20mg a day (<https://nap.edu/10026/>):

TABLE S-10 Tolerable Upper Intake Levels (UL)^a, by Life Stage Group

| Life Stage Group | Boron (mg/d) |
|------------------|-----------------|
| 0 through 6 mo | ND ^b |
| 7 through 12 mo | ND |
| 1 through 3 y | 3 |
| 4 through 8 y | 6 |
| 9 through 13 y | 11 |
| 14 through 18 y | 17 |
| ≥ 19 y | 20 |
| Pregnancy | |
| 14 through 18 y | 17 |
| 19 through 50 y | 20 |
| Lactation | |
| 14 through 18 y | 17 |
| 19 through 50 y | 20 |

Institute of Medicine 2001.
Dietary Reference Intakes for
Vitamin A, Vitamin K, Arsenic,
Boron, Chromium, Copper,
Iodine, Iron, Manganese,
Molybdenum, Nickel, Silicon,
Vanadium, and Zinc.

The National Academies Press.
<https://doi.org/10.17226/10026>
<http://nap.edu/10026>

^a The highest level of daily nutrient intake that is likely to pose no risk of adverse health effects to almost all individuals in the general population. As intake increases above

(This is the text, verbatim - in the PDF, the sentence is unfinished.
I edited the table to show only boron.)

From *Nothing Boring about Boron*:

A number of papers have indicated that **boron reduces levels of inflammatory biomarkers**. In a recent human trial involving healthy male volunteers (n = 8), a significant increase in concentrations of plasma boron occurred 6 hours after supplementation with 11.6 mg of boron, coupled with significant decreases in levels of hs-CRP and TNF- α . One week of boron supplementation 10 mg/d resulted in a 20% decrease in the plasma concentration of TNF- α [tumor necrosis factor alpha], from 12.32 to 9.97 pg/mL, and in remarkable decreases (approximately 50%) in plasma concentration of hs-CRP [high-sensitivity C-reactive protein], from 1460 to 795 ng/mL, and of **IL-6**, from 1.55 to 0.87 pg/mL.

Is boron adequacy important? Consider that elevated hs-CRP is associated with an increased risk for breast cancer, obesity and metabolic syndrome (MetS) in children, atherosclerosis, unstable angina, insulin resistance, type 2 diabetes, nonalcoholic fatty liver disease (NAFLD), metastatic prostate cancer, lung cancer, adult depression, depression in childhood and psychosis in young adult life, coronary heart disease, and stroke.

An assessment of high hs-CRP levels in <https://www.ahajournals.org/doi/10.1161>

[/JAHA.119.012638](#) is:

Most patients with myocardial infarction [heart attack] exhibit elevated hsCRP levels. Besides identifying populations at high-inflammatory risk, this study extends the prognostic validity of this biomarker from trial evidence to real-world healthcare settings.

Please take a look at <https://vitamindwiki.com/Vitamin+D+and+Boron> which links to articles such as M R Naghii et al. 2011:

Comparative effects of daily and weekly boron supplementation on plasma steroid hormones and pro-inflammatory cytokines

<https://tahomaclinic.com/Private/Articles1>

[/SHBG/Naghii%202011%20-%20boron%20on%20plasma%20steroid%20hormone](#)

10mg boron per day raised Vitamin D levels and reduced inflammatory cytokine levels.

3mg boron capsules are readily available, but in the current emergency, I think it would be good to instruct people to get a heaped teaspoon of borax (about 8 grams), divide it by 4, and dissolve each quarter in 2 litres of water. Two 50ml drinks a day provides 11.36 mg boron.

500 grams of borax is enough for 5,000 days at this rate, so a single borax purchase would help a dozen or so households through the current crisis.

Finally, there is controversy about the potential ill-effects of blood pressure medication on COVID-19 patients:

<http://www.nephjc.com/news/covidace2>

Most or all hypertension drugs are unnecessary, since the underlying cause of hypertension is dietary: inadequate potassium and excessive salt. Increasing the potassium to sodium ratio is well-known to be the best way to reduce hypertension, the risk of stroke, CVD etc. Dozens of widely cited articles confirm this, such as:

<https://jamanetwork.com/journals/jamainternalmedicine/fullarticle/11106080>

https://journals.lww.com/jhypertension/Abstract/2015/08000/Daily_potassium_intake_and_sodium_to_potassium.3.aspx

<https://academic.oup.com/advances/article/5/6/712/4558037>

About 2.4 grams of potassium is required to approximately double the daily intake. The US RDA used to be 4.7 grams. The "adequate" intakes (<https://ods.od.nih.gov/factsheets/Potassium-HealthProfessional/>) are now 3.4 grams for men and 2.6 grams for women. However, this is based on highest median intakes for supposedly "healthy" adults - and most Western adults going into their 50s and 60s suffer from hypertension, while stroke kills lots of people younger than this. Salt is hard to

avoid, and to maintain potassium to sodium ratios more like those of our ancestors, we need a lot more potassium than is available in most diets. According to <https://academic.oup.com/ajcn/article/96/3/647/4576899> 60% of US adults consumed more than 3 grams of sodium a day, which is twice the recommended maximum, while the median potassium intake was only 2.6 grams.

Potassium can't be ingested as tablets, since there is a limit of about 100mg per tablet. Therefore, it must be in food and/or a supplemental solution.

To get sufficient potassium in food would be difficult, since it would involve much more potatoes, bananas etc. than most people want to eat, or could sustain due to their high caloric value. See: <https://blog.watson-inc.com/nutri-knowledge/what-does-4700-mg-of-potassium-look-like> .

It is generally believed that potassium solutions can't be used since all potassium salts have a very strong taste. However, this is untrue. **Potassium gluconate has a mild taste.** An 8.6% solution (94 grams per litre water) tastes about as strong as 0.5% NaCl. Four 45 gram drinks per day gives about 2,400mg potassium. My wife Tina and I have been taking this for several years. We get the ~9kg per annum we need from PureBulk in the USA. We avoid the saltiest foods but otherwise do not obsess about it. We are 64 and 55 and our blood pressure is not elevated, even by recently lowered standards.

Conventional Western medicine excels at surgery and other acute interventions, but has blind-spots regarding nutrition and chronic diseases.

Since there is no money to be made from the nutrients mentioned above, their full benefits are known only to some clinicians and researchers. In the developed world, most people are deficient in potassium, vitamin D and especially boron. This leads to illness with aging, diabetes, stroke, CVD, sepsis etc.

As best we know, SARS-CoV-2 will induce debilitating and potentially deadly sepsis in 5 to 20% of the population in April, May and June. The terrible toll which is likely to come from this is due, in large part, to easily corrected nutritional inadequacies. These they can be solved, since the necessary nutrients are widely available. This will require an admission of the failure, so far, to clearly instruct people on the necessity of adequate levels of these nutrients.

It is not right for me to be making such recommendations to the public at large, since I have no medical training. I am an electronic technician, computer programmer and amateur neuroscientist: <http://aminotheory.com/rlsd/briefsumm/> . To the extent that advice such as the above is valid, it needs to come from clinicians and health authorities, *in the next few weeks*.

Sincerely

Robin Whittle

Daylesford, Victoria, Australia