

**LETTER TO THE EDITOR****Vitamin D status as a predictor of Covid-19 risk in Black, Asian and other ethnic minority groups in the UK**


Emerging data suggest vitamin D inadequacy, most common in dark-skinned Britons, is associated with increased severity and mortality of Covid-19 infections, observationally.<sup>1</sup> Prospectively, UK Biobank data analyses report no association.<sup>2</sup> However, vitamin D has effects that should reduce Covid-19 risks, increasing secretion of anti-bacterial/antiviral compounds [cathelicidin and defensins], reducing progression of protective to destructive inflammation by suppressing pro-inflammatory and stimulating anti-inflammatory cytokine production and increasing lung ACE2 production, recognized protective effect as noted by Grant et al.<sup>3</sup>

Observationally, vitamin D status (serum 25(OH)D concentration) may fall in Covid-19 infections (reverse confounding). Prospectively, assessments of vitamin D status as a predictor of Covid-19 risks in Black, Asian and Ethnic Minority (BAME) groups requires recognition of differences between people, and peoples, that directly affect serum 25(OH)D concentrations.

Serum 25(OH)D values are not simply related to available vitamin D through constitutive expression of the specific hepatic 25-hydroxylase enzyme since obesity reduces that enzymes expression, lowering serum 25(OH)D values, and explaining the x2 to 3-fold greater vitamin D intakes needed in obesity vs non-obesity to achieve comparable rises in serum 25(OH)D.<sup>4</sup> Skin synthesis of vitamin D is reduced by dark-skin since melanin is an effective sunscreen and dark-skinned populations are well-known to have greater rates of vitamin D deficiency in northern latitudes than pale-skinned people, needing greater exposure to UVB to achieve comparable improvements in vitamin D status to those in people with pale skin; these factors strongly support the comments of Grant et al.<sup>3</sup>

Obesity and BAME ethnicity, currently considered as major risk factors for increased Covid-19 severity, both reduce serum 25(OH)D directly. Thus, analyses of low vitamin D status as a potential casual factor for health risks should not be adjusted for those factors, to avoid confounding. Instead, analyses of vitamin D status in prediction of Covid-19 risks could be made separately for different ethnic groups<sup>2</sup> and also for obese and non-obese subjects within those groups. Clearly, therefore, the UK-Biobank analyses in question cannot be taken to be definitive in excluding vitamin D status as a predictor of Covid-19 risks in either dark, or pale, skinned subjects.<sup>2</sup>

This is important because if deficiency of vitamin D increases Covid-19 risks, then eliminating UK deficiency should provide cost-effective protection against Covid-19. It would also eliminate a multi-generational inequality in vitamin D status between BAME and non-BAME Britons<sup>5</sup> thereby contributing to the aims of the recently announced review on British ethnic inequalities. <https://www.theguardian.com/world/2020/apr/16/inquiry-disproportionate>.

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**REFERENCES**

1. Rhodes JM, Subramanian S, Laird E, et al. Perspective: Vitamin D deficiency and COVID-19 severity – plausibly linked by latitude, ethnicity, impacts on cytokines, ACE2, and thrombosis (R1) [published online ahead of print, Jul 2, 2020]. *CJ Intern Med*. 2020. <https://doi.org/10.1111/joim.13149>.
2. Hastie CE, Mackay DF, Ho F, et al. Vitamin D concentrations and COVID-19 infection in UKBiobank [published online ahead of print, May 7, 2020]. *Diabetes Metab Syndr*. 2020;14(4):561-565. [with responses].
3. Grant WB, Lahore H, McDonnell SL, et al. Evidence that vitamin D supplementation could reduce risk of influenza and COVID-19 infections and deaths. *Nutrients*. 2020;12(4):988. <https://doi.org/10.3390/nu12040988>.
4. Bouillon R, Bikle D. Vitamin D metabolism revised: fall of dogmas. *J Bone Miner Res*. 2019;34(11):1985-1992.
5. Bivins R. "The English disease" or "Asian rickets"? Medical responses to postcolonial immigration. *Bull Hist Med*. 2007;81(3):533-568. <https://doi.org/10.1353/bhm.2007.00625>.