Vitamin D status, dietary vitamin D intake, and personal UVB exposure of Xhosa and Cape Mixed participants in Cape Town, South Africa, in summer, winter, and after receiving vitamin D3 in winter.

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Vitamin D status, dietary vitamin D intake, and personal UVB exposure of Xhosa and Cape Mixed participants in Cape Town, South Africa, in summer, winter, and after receiving vitamin D₃ in winter. (A) Study design. (B and C) Serum 25(OH)D concentration stratified by season (B) and after receiving vitamin D₃ (C). Dotted lines indicate status thresholds: insufficiency, <75 nmol/L; deficiency, <50 nmol/L; severe deficiency, <30 nmol/L. (D and E) Serum 25(OH)D concentration stratified by sex (female, ♀; male, ♂) in Xhosa (D) and Cape Mixed (E) participants. (F) Dietary vitamin D intake measured by the food frequency questionnaire. Dotted lines indicate EAR. (G and H) Dietary vitamin D intake stratified by sex in Xhosa (G) and Cape Mixed (H) participants. (I) PNUVB. Xhosa: summer, n = 50; winter n = 33; winter + vitamin D, n = 30; Cape Mixed: summer and winter, n = 50. Medians are indicated by red lines. Significance was tested by the Wilcoxon rank test between seasons, by the Friedman test with Dunn’s multiple comparisons test for 25(OH)D postsupplementation (n = 30), and by the Mann–Whitney test between populations and sex; *P < 0.05; **P < 0.01; ***P < 0.001; ****P < 0.0001.
FBC and HIV-1 replication in PBMCs from Xhosa participants in summer, winter, and after receiving winter vitamin D supplementation.

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FBC and HIV-1 replication in PBMCs from Xhosa participants in summer, winter, and after receiving winter vitamin D supplementation. (A–F) Box plots show WBC (A), lymphocyte (B), monocyte (C), and RBC (D) counts, RBC distribution width (E), and mean corpuscular volume (F) measured at each study visit (summer, \( n = 42 \); winter, \( n = 23 \); winter + vitamin D, \( n = 30 \)). The lines across the box plots indicate the median (minimum–maximum); Kruskal–Wallis with Dunn’s multiple comparison test. (G) HIV-1 p24 concentration in culture supernatant 9 d postinfection of PBMCs (\( n = 30 \) longitudinally; the line indicates the median) with purified HIV-1 on the day of phlebotomy in 20% autologous serum; Friedman test with Dunn’s multiple comparison test. (H and I) HIV-1 p24 concentration in culture supernatant on day 3, 6, and 9 postinfection of PBMCs (\( n = 30 \) longitudinally, median (IQR)) with purified HIV-1 (H) or unpurified HIV-1 (I); repeated measures two-way ANOVA with Tukey’s multiple comparison test following log\(_{10}\) transformation. *\( P < 0.05 \); **\( P < 0.01 \); ***\( P < 0.001 \); ****\( P < 0.0001 \). LOD, limit of detection (1 pg/mL); ns, not significant.
Study Profile:

104 assessed for eligibility

Healthy 18-24 yrs
Exclusions: HIV-infected, pregnant, vitamin supplement use, corticosteroid use, BMI>30, symptomatic
2 Excluded: Poor/no blood draw

50 Xhosa: Summer
15 did not return for follow-up
2 excluded
• HIV-infected (1)
• Pregnant (1)

50 Cape Mixed: Summer

33 Xhosa: Winter
3 did not return for follow-up

50 Cape Mixed: Winter
6 weekly doses of 50,000IU vitamin D₃
50 Not followed-up

30 Xhosa: Winter + Vitamin D

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Study profile. We assessed 104 patients for eligibility to participate in the study between February 4 and February 28, 2013. Of these, two were ineligible: one did not attend for phlebotomy at visit 1, and one could not undergo successful phlebotomy. Of these subjects, 100 (50 Xhosa and 50 Cape Mixed) completed the summer visit. Winter participants were recruited between August 1 and August 30, 2013. All Cape Mixed and 35 Xhosa participants returned for follow-up in winter; two of the Xhosa participants were excluded because of pregnancy or HIV-infection, resulting in 33 eligible participants in winter. All participants received six oral capsules of 50,000 IU cholecalciferol at the winter visit. Administration of the first capsule was observed directly, and participants were told to take one capsule per week for the next 5 wk. Thirty Xhosa participants were followed up 6 wk (± 15 d; average +3 d) after receiving vitamin D supplementation (D3-50; Biotech Pharmaceutical).
Acute-phase marker, DBP, and corrected calcium assessment.

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Fig S2
Acute-phase marker, DBP, and corrected calcium assessment. (A–C and E) In all participants the acute-phase markers serum CRP (A), haptoglobin (B), and β2 microglobulin (C) and DBP (E) were measured at each time point. (D) Corrected calcium was measured in the 30 individuals who had 25(OH)D measured postsupplementation. (F) Summer serum DBP was stratified according to DBP Gc Haplotype. Red lines indicate the median (mean in D) and dotted lines indicate the upper level of the normal reference range for acute-phase markers. All participants fell within the normal range, except for one participant who had consistently high β2 microglobulin or haptoglobin at more than one time point and three who had elevated levels of either β2 microglobulin or haptoglobin at one time point. However, all participants’ CRP remained normal throughout the study, and therefore these participants were included in the study as healthy participants. There was a small but significant increase in CRP levels in Xhosa participants in winter as compared with summer, but this increase remained within the normal range. There was no effect of season or vitamin D supplementation on corrected calcium. Xhosa participants had significantly higher DBP levels in summer and in winter than Cape Mixed participants. There was no effect of season on DBP levels in either population, nor was there an effect of Gc haplotype on serum DBP levels. Significance was analyzed by a Kruskal–Wallis test with Dunn’s multiple comparisons (intra-Xhosa, except in D, which used Friedman’s test), Wilcoxon rank test (intra-Cape Mixed) or Mann–Whitney u test (intergroup); *P < 0.05; **P < 0.01.
Stratification of serum 25(OH)D concentration by genotype and season/supplementation.

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Stratification of serum 25(OH)D concentration by genotype and season/supplementation. Data were combined for both populations. $DBP$ Gc haplotypes: 1, Gc1F/Gc1F; 2, Gc1F/Gc2; 3, Gc2/Gc2; 4, Gc1F/Gc1S; 5, Gc2/Gc1S; 6, Gc1S/Gc1S. Data were analyzed by a Kruskal–Wallis with Dunn’s multiple comparisons test, within each season. The lines across the boxplots indicate the median (minimum–maximum); *$P < 0.05$; **$P < 0.01$; ****$P < 0.0001$. $DBP$ rs7041, $DHCR7$ rs12785878, and $CYP24A1$ rs6013897 only had one individual homozygous for the minor allele at the supplementation visit, and these alleles were not analyzed for significance.
FBCs and HIV-1 replication in ex vivo PBMC infections.

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