

## Socioeconomic status predicts vitamin D status in a large cohort of Irish children

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Vitamin D is essential for bone and muscle health with adequate status in childhood crucial for normal skeletal development<sup>(1)</sup>. Factors related to familial socioeconomic status (SES) have been suggested to affect vitamin D including lower diet quality, reduced intake of oily fish and supplements, and less access to outdoor amenities<sup>(2–4)</sup>. In Ireland, vitamin D synthesis is limited between October and March, as such deficiency is common in adults, with limited research in children. We aimed to investigate vitamin D status in a convenience sample (n = 1,226) of Irish children (aged 1–17 years) who had serum 25-hydroxyvitamin D (25(OH)D) tested by request of their GP at a Dublin Hospital between 2014–2020. A search was completed on 25(OH)D serum results, analysed by liquid chromatography tandem mass spectrometry, at St James's Hospital Biochemistry Department between 2014 and 2020. A sample was identified using the exclusion criteria: age  $\geq 18$  years on initial test, incomplete or missing demographic data, non-community address (e.g., Hospital) or location outside the Republic of Ireland. Participant SES was assessed by mapping postal addresses using the 2016 Pobal HP (Haase-Pratschke) Deprivation Index based on the Population Census. We examined vitamin D status and predictors including age, sex, season and SES using Chi2, Kruskal-Wallis and multi-nominal logistic regression analysis. Vitamin D deficiency (<30 nmol/L) was prevalent affecting 23% and was more common in disadvantaged areas (34%) and in those aged >12 versus  $\leq 12$  years (24% vs. 16%, P = 0.033).

The greatest predictor was SES (disadvantaged versus affluent, OR 2.18, CI 1.34–3.53, P = 0.002), followed by female sex (OR 1.57, CI 1.15–2.14, P = 0.005) and winter season (October to February, OR 1.40, CI 1.07–1.84, P = 0.015). More than a half (50.6%) had levels <50 nmol/L, with higher levels in winter versus summer (55.3% vs. 46.9%, P = 0.003). This is the largest study of vitamin D status in Irish children to date. One quarter of our sample were deficient, rising to one third in those in disadvantaged areas. Females, those tested in winter and aged over 12 yrs. had a higher prevalence of deficiency. Public health strategies to improve vitamin D status in Irish children, including systematic food fortification, may need to be considered to address this issue.

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### References

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