Reviewer’s report

Title: Factors affecting Vitamin D status in different populations in the city of Sao Paulo, Brazil: The Sao PAulo Vitamin D Evaluation Study (SPADES)

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Reviewer: Ambrish Mithal

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The study provides valuable information on Vitamin D status from a region of the world from where scant data is available. The groups have been carefully chosen and highlight the impact of age and different dwelling characteristics on Vitamin D levels. Several points however need clarification:

1. The authors have chosen to ignore data from other sunny countries. This includes in particular studies from India, Lebanon and Saudi Arabia which demonstrate some of the lowest 25(OH)D levels. Their attention is drawn to an International Osteoporosis Foundation review (Mithal et al. Global vitamin D status and determinants of hypovitaminosis D Osteoporos Int. 2009; 20(11):1807-20) and a recent IOF article (Wahl et al. A global representation of vitamin D status in healthy populations. Archives of Osteoporosis 2012, 7; 155-172) which highlight geographical differences in vitamin D status. It is well established that sun fleeing behaviour in sunny countries can result in severe vitamin D deficiency. In fact South Asia and the Middle East are the considered the most severely affected regions in the world.

2. In the abstract certain words may be replaced by more appropriate ones
   (i) replace "behavioural" in "We aimed to evaluate 25-hydroxyvitamin D concentrations and its determining factors, in individuals in the city of São Paulo belonging to different age groups and presenting different behavioral characteristics”
   (ii) "distributed" in “591 people were included and distributed as follows”
   (iii) desirable in “According to the correlation with PTH, the desirable 25(OH)D concentrations should be above 75.0 nmol/L.”. At best the authors can say that PTH values tend to plateau above 75 nmol/L. Whether that translates into "desirable" PTH level remains unproven.

3. The sentence “The existence of seasonal effects on 25(OH)D concentration throughout the year was evident for all the groups” studied is contradictory to the findings of the authors.

4. The authors have made an oversimplification of the Vitamin D -PTH relationship. The relation between 25(OH)D and PTH has been inconsistent through many studies. (Need AG et al. Vitamin D status: effects on parathyroid hormone and 1, 25-dihydroxyvitamin D in postmenopausal women Am J Clin
Nutr. 2000 ;71(6):1577-81; Adami S et al. Relationship between serum parathyroid hormone, vitamin D sufficiency, age, and calcium intake. Bone. 2008;42(2):267-70; Steingrimsdottir L, Relationship between serum parathyroid hormone levels, vitamin D sufficiency, and calcium intake. JAMA. 2005 9;294(18):2336-41.) The fact that PTH level is not elevated in many patients with vitamin D deficiency remains an unexplained phenomenon.

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Needs some language corrections before being published

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

'I declare that I have no competing interests’