Americans' vitamin D levels are highest in August, lowest in February, study shows

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UC Irvine and Mayo Clinic researchers have found that vitamin D levels in the U.S. population peak in August and bottom out in February. The essential vitamin – necessary for healthy bones – is produced in the skin upon exposure to ultraviolet B rays from the sun.

Vitamin D helps bones absorb calcium and can protect against osteoporosis. It's also thought to play a role in seasonal illnesses, such as the flu. Low levels of vitamin D are believed to impair "innate immunity" i.e., the body's first line of defense against pathogens. To further study this link, good estimates of the cyclicality of the vitamin are necessary. Solar exposure – a timely topic since June 21 marks the first day of summer – is the most important way people acquire vitamin D. But certain foods, including egg yolks and oil-rich fish like mackerel, salmon, sardines and herring contain the nutrient. In addition, milk and cereal are often enriched with vitamin D.

"Even with food fortification, vitamin D levels in the population show a high level of seasonality due to the influence of sunlight," said Amy Kasahara, a UC Irvine graduate student in public health and first author on the paper, which appears in the journal *PLOS ONE*.

"The exact biochemical pathways from UVB rays to vitamin D were discovered in the 1970s," she said. "In this study, we have shown that vitamin D levels lag the solar cycle, peaking in August and troughing in February."

The correlation between the seasons and vitamin D has been known for some time. "What we have been able to do is put a lot more precision on the estimates of vitamin D seasonality," said Andrew Noymer, associate professor of public health and senior author of the article.

"Our analysis, combined with other data, will help contribute to understanding the role of vitamin D in all seasonal diseases, where the simple winter/spring/summer/fall categories are not sufficient."

Researchers measured the level of 25-hydroxyvitamin D in 3.4 million blood samples collected weekly in the U.S. between July 2006 and December 2011.

The study looked at population averages, so people shouldn't make assumptions about their own levels of vitamin D based on the calendar. Healthcare providers can perform individual blood tests to measure vitamin D directly, and supplements are available for those who cannot or do not receive enough exposure to sunlight.

Ravinder J. Singh of the Mayo Clinic co-authored the work.

Provided by University of California, Irvine