Human migration patterns connected to vitamin D deficiencies today

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A new study in the *Oxford Economic Papers* finds that migration flows the last 500 years from high sunlight regions to low sunlight regions influence contemporary health outcomes in destination countries.

The researchers here noted that people's ability to synthesize vitamin D

from sunlight declines with skin pigmentation, and that vitamin D deficiency is directly associated with higher risk of mortality, from illnesses including cardiovascular disease, type 1 and type 2 diabetes, hypertension, and certain cancers. Recent research even .finds that vitamin D affects the severity of COVID-19.

Researchers here focused on groups from high sunlight regions that migrated to low sunlight regions between 1500 and today. The resulting population shifts caused the risk of vitamin D deficiency to rise substantially. The researchers explored the aggregate health consequences of such migration over a long historical perspective.

Researchers here constructed a measure that proxied the risk of vitamin D deficiency in a given population. The measure tracked the difference between sunlight intensity in the ancestral place of residence of the population, as well as the actual level of sunlight intensity at the place of current residence.

Using the difference between ancestor and ambient sunlight as a measure of the potential risk of vitamin D deficiency, researchers then examined its explanatory power in relation to life expectancy around the world. Researchers found that greater risk of vitamin D deficiency is negatively correlated with life expectancy, all else equal.

Researchers here noted that today there is widespread awareness of the harmful effects of excessive exposure to sunlight, which leads people to try to prevent sunburn through methods like sunscreen and limited outdoor exposure. Effective treatments of skin cancer are also widely available. People also spend more time indoors than their prehistoric ancestors, which lowers their exposure to sunlight. Consequently, the risk of premature death due to excessive sun exposure has decreased since prehistoric times.

However, the lower exposure times to sunlight increases the risk of vitamin D deficiency, particularly in people with higher skin pigmentation, whose ancestors came from high sunlight regions.

Ultimately the researchers here concluded that a migration-induced imbalance between the intensity of skin pigmentation and ambient sunlight can both relate and explain present-day global health differences. Low sunlight regions that have received substantial immigration from high sunlight regions experience lower life expectancy than would have been the case in the absence of such migration flows.

"This research is important because it is the first research to document a link between an increased risk of vitamin D deficiency and differences in life expectancy across countries and regions. It thus serves to highlight the potentially huge benefit in terms of additional life years of taking vitamin D supplements, particularly during the autumn and winter," said author Dr. Thomas Barnebeck Andersen.

More information: *Oxford Economic Papers* (2020). DOI: 10.1093/oep/gpaa047

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