Vitamin D deficiency is widespread across Europe – Data from University College Cork Nutrition Scientists highlight the need for food-based strategies

One in every eight Europeans has vitamin D deficiency, according to University College Cork-based coordinators of the European Commission-funded, adults, and elderly, which collectively *ODIN* vitamin D project. The scientists conducted an analysis of vitamin D status in 18 nationally or regionally representative studies of European children, teenagers included 55,844 individuals. These first internationally comparable data present firm evidence for significant risk to public health from vitamin D deficiency in Europe.

Vitamin D deficiency in Europe – a time for action

Scientists at University College Cork (UCC) report this week in the *American Journal of Clinical Nutrition* that the prevalence of vitamin D deficiency in Europe is 13%, that is one in every eight individuals. Furthermore, up to 40% of individuals have vitamin D levels which are not sufficient to support good bone health, according to the results of the *ODIN* vitamin D project, co-coordinated by Professors Kevin Cashman and Mairead Kiely at UCC's Cork Center for Vitamin D and Nutrition Research.

Severe vitamin D deficiency causes rickets in children and osteomalacia in adults. It may also increase risk of many other chronic non-bone related diseases. Knowledge of the percentage of the population in European countries with vitamin D deficiency, as well as which groups within the population are at increased risk, is critical not only for quantifying the size of this public health problem but also devising strategies to bring about its prevention.

Making comparisons on the prevalence of vitamin D deficiency across different countries is problematic because labs use a variety of different methods for measuring vitamin D levels, which can give widely different results for the same blood sample. To tackle this, the Office of Dietary Supplements-National Institutes of Health in the US spear-headed an initiative to standardize vitamin D measurement. UCC is one the key partners in this *Vitamin D Standardization Program*. A key aim of the *ODIN*

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project was to apply the approaches devised by the *Vitamin D Standardization Program* to data from 18 European studies of children, teenagers, adults, and elderly, including a total of 55,844 individuals, and spread from as southerly as Crete (35ºN) to as northerly as Tromsø, Norway (69ºN). This allowed for more valid comparisons of vitamin D status across European studies and a more accurate overall estimate of the prevalence of vitamin D for Europe. The benefits of using this standardization approach can be illustrated by the results of the *ODIN* study which showed, as just two examples, that ~10 million few German adults and quarter of a million more Irish adults had vitamin D deficiency using the standardized vitamin D levels compared to non-standardized levels.

Sunlight is the main source of vitamin D, as it enables the body to make the vitamin in the skin. Sunlight, season and skin colour are key factors that determine our vitamin D levels. For example, dark-skinned individuals are more prone to deficiency than people with a light skin tone, because dark skin is less efficient at making vitamin D even when exposed to sunlight. Worrying results from the *ODIN* study show that 18 to 65% of dark-skinned individuals in the UK, Norway and Finland were vitamin D deficient, much higher than the white populations in those countries. However, the prevalence of vitamin D deficiency among white Europeans is also of concern. Our data, which show that 12-15%, 12% and 20% of the German, Irish and UK populations had vitamin D deficiency, respectively, would translate to about 24 million individuals in these countries alone.

This first European-wide information on vitamin D status is critically important for public health authorities across Europe.

The remedy ? Foods with increased levels of vitamin D! While sunlight is a key provider it is not strong enough during winter months to allow skin to make vitamin D, this is referred to as the ‘vitamin D winter’. Even in summer, public health advice suggests limiting unprotected sun exposure due to important concerns about skin damage and cancer. The alternative source of vitamin D is the diet, however the amount of naturally-occurring vitamin D in the diet is low. Professors Cashman & Kiely and their UCC team together with 30 partnering research groups across Europe in the *ODIN* project are also developing food-based strategies to prevent vitamin D deficiency. The

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UCC-based coordinators and their project partners will present this new information on vitamin D deficiency, as well as results from studies within the project on vitamin D-enhanced foods, such as bread, mushrooms, cheese, cultured fish, pork, beef and eggs, at the European Commission, next month.

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