

The challenges of harmonising the iodine supply across Europe

Iodine, as a component of the thyroid hormones, is required for brain and neurological development; its deficiency during pregnancy and early life is associated with poorer cognitive function in the offspring.¹ This deficiency has implications at both the individual level (eg, lower intelligence quotient¹) and at the country level (eg, economic potential²). Iodine deficiency affects many pregnant women in Europe,³ and although this is a public health concern, there is a lack of consistency across countries both in the supply of iodine (eg, iodised salt programmes) and the monitoring of iodine status of the population.⁴

Harmonisation of iodine nutrition in Europe was the subject of a symposium held on September 3, 2016, at the European Thyroid Association meeting (Copenhagen, Denmark), organised by the Iodine Global Network and the EUthyroid project. EUthyroid is a European Union-funded project with the goal of harmonising and sustainably improving iodine intake in Europe. It aims to build consistency in the monitoring of iodine status across the 30 countries involved in the project (figure), and to evaluate the cost-effectiveness of prevention of iodine deficiency. The symposium gathered experts in iodine, the thyroid, and nutrition to discuss iodine deficiency in Europe and to highlight the work that will be conducted by the EUthyroid project to address some key research questions.

Iodine status varies widely across Europe, and the classification of iodine status in population groups also differs within countries (figure). For example, some countries are classified as iodine deficient in both the general population and in pregnant women (eg, UK), some are iodine sufficient in both the general population and in pregnant women (eg, Netherlands), whereas many are classified as iodine-sufficient but with deficiency in pregnant women (eg, Spain). The figure also illustrates the lack of data in a number of countries, particularly with respect to the iodine status of pregnant women.

Iodine intake varies between countries as a result of both differences in eating habits and variation in the iodine concentration of foods. Furthermore, iodised salt programmes, the method recommended by WHO for prevention of deficiency,⁶ are not consistent. There is variation in whether iodised salt polices are mandatory

or voluntary,⁴ the concentration of iodine in salt, the coverage of, and access to, iodised salt, and the use of iodised salt in processed food.³ This variation in iodine supply was highlighted at the symposium and examples were given from two countries—Norway and the UK—where there is poor availability of iodised salt and the main dietary source of iodine is milk. Data from both countries have shown that individuals, especially children, who consume high quantities of milk might exceed the iodine requirement from milk alone.^{7,8} These findings emphasise the fact that iodine fortification programmes need to be tailored to each country to take into account background exposure from other dietary sources. EUthyroid will collect standardised data on iodine intake in participating countries, and will create a reference database and map.

An important research question that needs to be addressed, both for future research and for clinical

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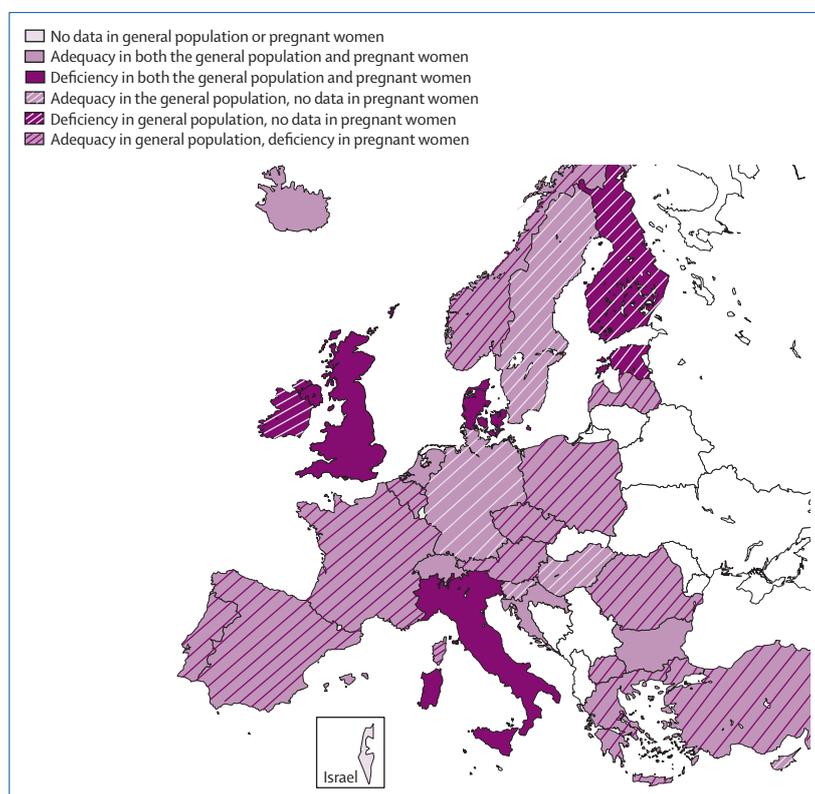


Figure: Iodine status of the 30 countries involved in the EUthyroid project. Background colour refers to the iodine status in the general population,⁵ and the colour of the lines (using the same key) represents the iodine status of pregnant women.³ Countries with solid colours have the same iodine status in both the general population and in pregnant women.

practice, is how iodine status can be measured in an individual, particularly during pregnancy. At present there is no such biomarker because urinary iodine concentration can only be used to classify iodine status at the group, or population, level.^{5,9} The thyroid-specific protein thyroglobulin has shown promise as an iodine biomarker in children,⁹ but data are sparse in pregnant women. The EUthyroid project will evaluate the usefulness of thyroglobulin (measured from dried blood spots) as a biomarker of iodine status in pregnancy, using data from women across Europe that covers a range of iodine intake (figure).

The effects of severe iodine deficiency on the developing brain are well known,¹⁰ but the effect of mild-to-moderate iodine deficiency, which is more likely in European countries, is less certain.¹ There are no adequately powered, randomised, controlled trials of iodine supplementation in pregnant women, with child cognitive outcomes, in regions of mild-to-moderate iodine deficiency.¹ Cohort studies in Europe have provided evidence of an association between low iodine status in pregnancy and poorer neurocognitive development,¹ but these studies are limited because they relied on just one measure of iodine status in pregnancy. The EUthyroid project will extend this work by using repeated measures of iodine status in pregnant women from three European cohort studies. These cohorts are based in regions of different iodine status—ie, the Netherlands (iodine sufficient), Spain (sufficient but deficient in pregnant women), and the UK (iodine deficient; figure)—thus generating data from a wider range of iodine intake than in previous studies.

Iodine deficiency remains an issue that affects a considerable proportion of the European population and much more research is required. Some of the gaps in knowledge and practice will hopefully be filled by

the EUthyroid project; indeed a coordinated approach is necessary to tackle outstanding research questions and to attempt to deal with the current disparity in iodine nutrition across Europe. However, for iodine deficiency to be eliminated in Europe in the long term, a sustainable approach is needed. Frameworks and approaches need to be developed that will ensure adequate iodine nutrition across Europe long after the EUthyroid project ends in 2018.

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