

Thyroid Disease Around the World

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KEYWORDS

- Thyroid disease • Thyroid cancer • Iodine deficiency • Thyroid surgery
- Developed world • Developing world • Low-resource setting

KEY POINTS

- Iodine deficiency is one of the world's most prevalent nutrient deficiencies, heavily associated with the development of an epidemic of goitrous thyroid glands.
- Thyroid cancer rates are significantly on the rise although overall thyroid cancer-associated mortality is fortunately not following suit; therefore, one must be cautious of potential over-screening and overdiagnosis.
- Thyroid surgery in the developing world can vary from that performed in the developed world and should be performed in accordance with the resource setting and patient compliance.
- With the increase in thyroid cancer incidence, the economic burden of the disease will continue to increase. Efficiency and selective treatment will be key in the future.

Thyroid disease will affect approximately 1 in 20 Americans in their lifetime, with women being approximately 7-fold more likely to be affected.¹ In fact, 1 in 8 women in the United States will develop a thyroid disorder at some point during their lifetime.¹ The most common form of thyroid disorder remains thyroid goiter, whereas thyroid cancer is the most common endocrine neoplasia and represents approximately 1.5% to 2.1% of all cancers diagnosed annually worldwide.^{2,3} As such, this article focuses on 2 of the most clinically important subgroups of thyroid disease: iodine deficiency and thyroid goiter, and thyroid cancer.

IODINE DEFICIENCY AND GOITROUS THYROID

Iodine deficiency is one of the world's most prevalent yet preventable nutrient deficiencies, affecting an estimated 35% to 40% of the world's population,⁴ and is

Disclosure Statement: The authors have nothing to disclose.

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Otolaryngol Clin N Am ■ (2018) ■–■
<https://doi.org/10.1016/j.otc.2018.01.014>

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considered a public health problem in almost 50 countries.⁵ Other than the development of goitrous thyroid glands, iodine deficiency causes a wide spectrum of disorders, such as mental retardation, stunted growth, brain damage, congenital defects, and stillbirth, among others. Death directly secondary to iodine deficiency is not common (1 per one million people per year); however, it is principally found in the poorly developed countries of Africa and Central and Southeast Asia (Fig. 1).⁶ Furthermore, iodine deficiency has been shown to be associated with higher rates of follicular thyroid carcinoma as well as poorly differentiated and anaplastic carcinoma.⁷ The International Child Development Steering Group identified iodine deficiency as one of the 4 key global risk factors for impaired child development, whereby the need for intervention is urgent.⁸ Salt iodization is the most cost-effective way of delivering iodine in deficient populations. It is clear in the World Health Organization's recent statement that salt iodization is imperative and clearly demonstrates that when implemented, it significantly reduces the risk and prevalence of goiter as well as other iodine deficiency disorders.⁹ Furthermore, studies have shown a shift in the subtypes of thyroid cancer, with higher papillary to follicular thyroid carcinoma ratios and a decrease in the percentage of anaplastic thyroid carcinomas, in regions where salt iodization was introduced or increased.¹⁰

Thyroid goiter is primarily benign and affects approximately 7% of the worldwide population. Goiter is, however, associated with thyroid cancer. Thyroid cancer has been reportedly found in 10% to 15% of goiters^{11,12} and as high as in 20% in endemic multinodular goiter regions.^{13,14} Furthermore, in poor rural areas in Sub-Saharan Africa, where cassava is commonly eaten, linamarin (a cyanogenic glucoside) significantly increases the severity of goiter endemia.¹⁵ Interestingly, although thyroid cancer rates are generally higher in women, when it comes to goiter-associated incidental thyroid cancer, one study has suggested that male sex and younger age may be risk factors.¹⁶

Goiters can be nontoxic or toxic and may induce compressive symptoms and cosmetic deformities. Although globally goiters are principally secondary to iodine deficiency, in countries where iodine deficiency is not a major factor, multinodular thyroid disease, chronic autoimmune thyroiditis, and Grave disease are common causes

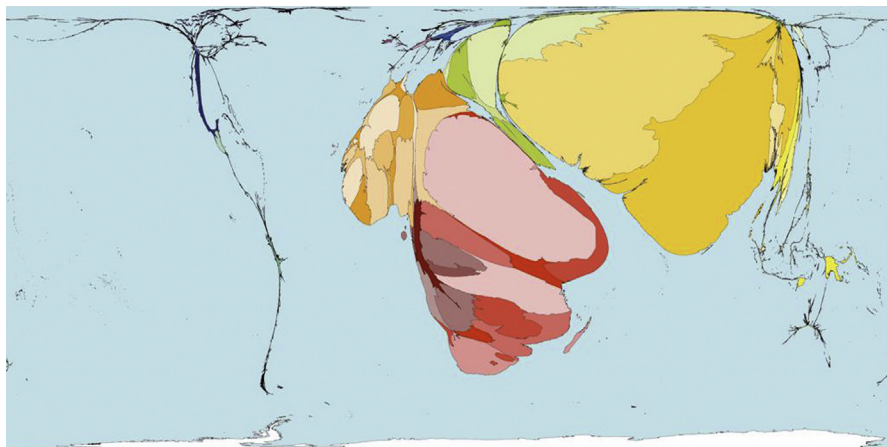


Fig. 1. Map of the world sized in proportion to the absolute number of people who died of iodine deficiency in 1 year. (From Worldmapper. Map number 415: iodine deficiency deaths. Available at: <http://www.worldmapper.org/>. Accessed June 20, 2017; with permission.)

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