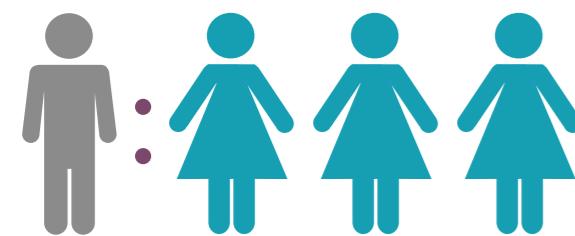


**→ Cancers derived from follicular cells in the thyroid gland, which secrete the iodine-containing thyroid hormones, are classified as papillary thyroid cancer (80–85%), follicular thyroid cancer (10–15%), poorly differentiated thyroid cancer (<2%) and undifferentiated (anaplastic) thyroid cancer (<2%).**

## EPIDEMIOLOGY



Thyroid cancer affects threefold more women than men. In fact, thyroid cancer is the second-most or third-most common cause of cancer in women 15–49 years of age in most countries. The incidence is higher in women in developed countries (15.3 per 100,000) than in developing countries (1.8 per 100,000). However, the prognosis is good given that mortality rates are only <1 per 100,000 in both sexes in most regions.



## SCREENING

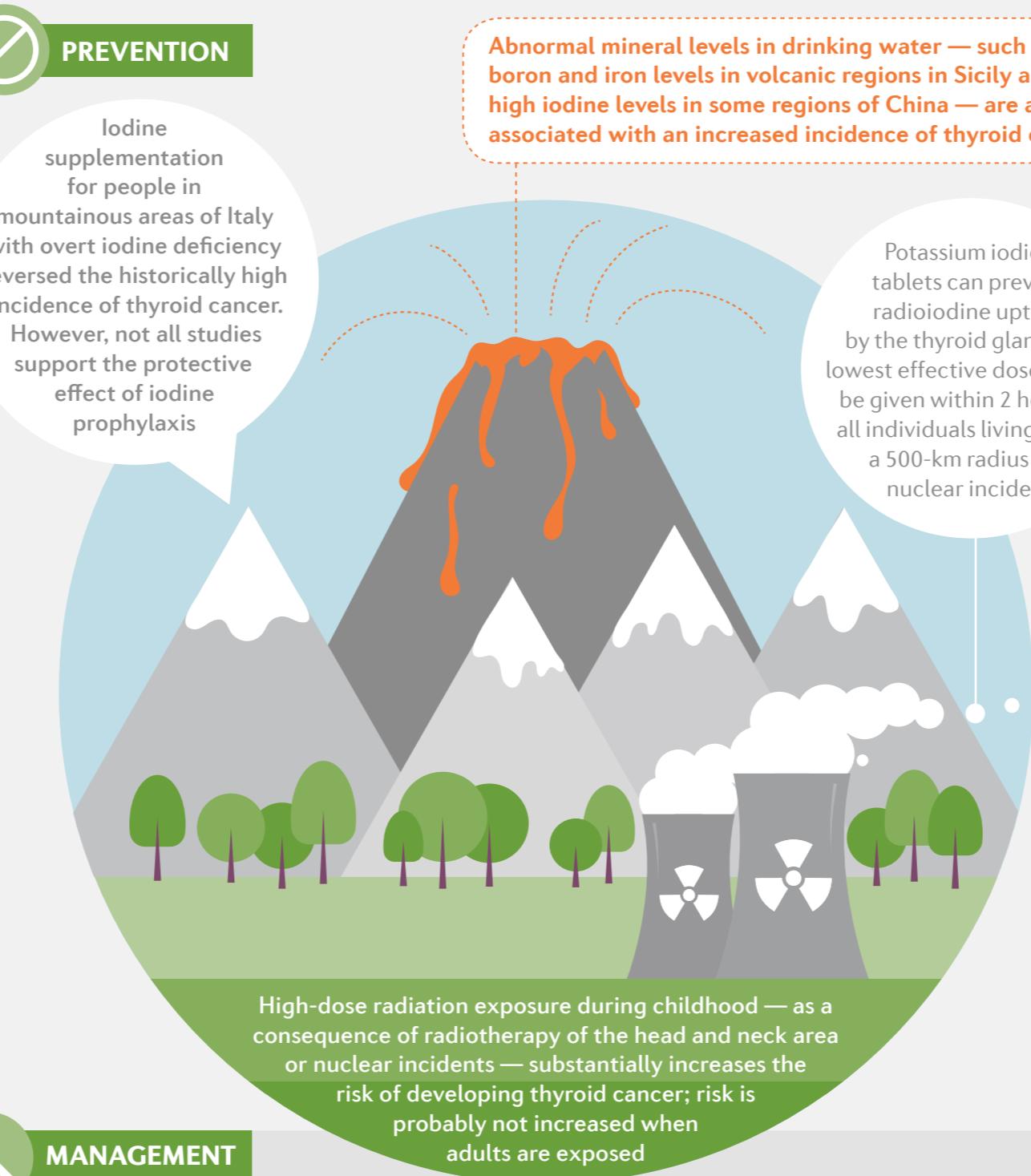
Screening of the general population is not recommended because of overdiagnosis of clinically irrelevant nodules. Screening might be beneficial in populations at risk, such as those who received head and neck radiotherapy during childhood or those who have genetic risk factors including familial syndromes leading to an overall increased risk to cancer, or specifically to papillary thyroid cancer (familial non-medullary thyroid carcinoma).

## PREVENTION

Iodine supplementation for people in mountainous areas of Italy with overt iodine deficiency reversed the historically high incidence of thyroid cancer. However, not all studies support the protective effect of iodine prophylaxis

**Abnormal mineral levels in drinking water — such as high boron and iron levels in volcanic regions in Sicily and high iodine levels in some regions of China — are also associated with an increased incidence of thyroid cancer**

Potassium iodide tablets can prevent radioiodine uptake by the thyroid gland; the lowest effective dose should be given within 2 hours to all individuals living within a 500-km radius of a nuclear incident



## MANAGEMENT

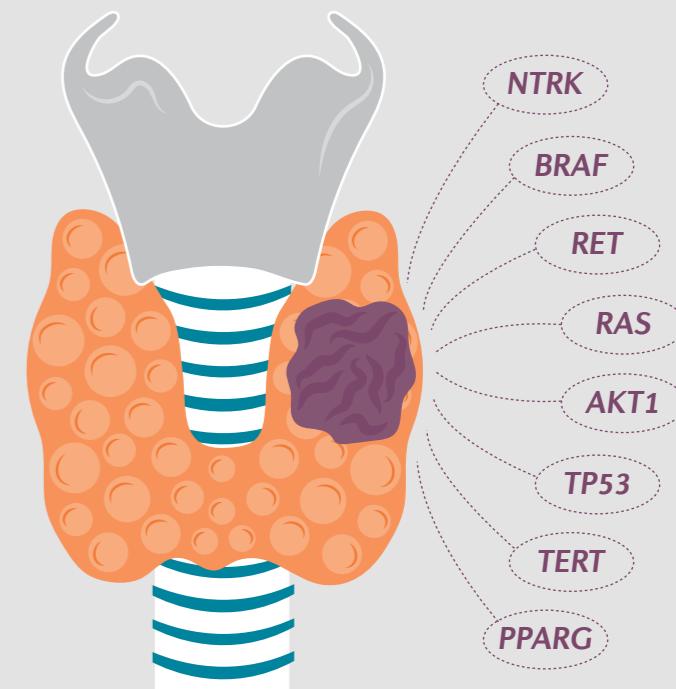
Microsurgical removal of the primary tumour and involved lymph nodes is the primary treatment strategy. Complications are not attributed to the loss of thyroid function, but to damage to the

adjacent structures (the laryngeal nerve and the parathyroid glands). Radioiodine ablation following thyroid-stimulating hormone (TSH) treatment can be performed to eradicate thyroid remnants

or metastases. Thyroid hormone therapy, with the aim of suppressing TSH, reduces cancer recurrence. Tyrosine kinase inhibitors can be used to treat radioiodine-refractory metastatic disease.

## MECHANISMS

Initiation and progression of thyroid cancer occurs through the accumulation of genetic, epigenetic and microRNA alterations. Gene alterations that are associated with thyroid cancer can be separated into point mutations and chromosomal rearrangements. Chromosomal rearrangements have a strong association with fragile, unstable chromosomal regions (for example, fragile sites FRA10G and FRA10C on chromosome 10) and exposure to ionizing radiation; up to 80–95% of the tumours associated with the Chernobyl nuclear accident are driven by gene fusions.



## DIAGNOSIS



Thyroid cancer is often asymptomatic, and most patients are diagnosed when the neck is investigated for unrelated medical reasons or when metastases develop. Diagnosis involves ultrasound-based examinations, radioisotope thyroid scans to detect nodules and cytological examination of fine-needle aspiration biopsies. Low TSH levels indicate a hyperfunctional gland.