



Original Research

The impact of overdiagnosis on thyroid cancer epidemic in Italy, 1998–2012



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KEYWORDS

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Abstract *Aims:* In Italy, incidence rates of thyroid cancer (TC) are among the highest worldwide with substantial intracountry heterogeneity. The aim of the study was to examine time trends of TC incidence in Italy and to estimate the proportion of TC cases potentially attributable to overdiagnosis.

Methods: Data on TC cases reported to Italian cancer registries during 1998–2012 aged <85 years were included. Age-standardised incidence rates (ASR) were computed by sex, period, and histology. TC overdiagnosis was estimated by sex, period, age, and Italian region.

Results: In Italy between 1998–2002 and 2008–2012, TC ASR increased of 74% in women (from 16.2 to 28.2/100,000) and of 90% in men (from 5.3 to 10.1/100,000). ASR increases were nearly exclusively due to papillary TC (+91% in women, +120% in men). In both sexes, more than three-fold differences emerged between regions with highest and lowest ASR. Among TC cases diagnosed in 1998–2012 in Italy, we estimated that overdiagnosis accounted for 75% of cases in women and 63% in men and increased over the study period leading to overdiagnosis of 79% in women and 67% in men in 2008–2012. Notably, overdiagnosis was over 80% among women aged <55 years, and substantial variations were documented across Italian regions, in both genders.

Conclusion(s): Incidence rates of TC are steadily increasing in Italy and largely due to overdiagnosis. These findings call for an update of thyroid gland examination practices in the asymptomatic general population, at national and regional levels.

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1. Introduction

Incidence rates of thyroid cancer (TC) increased in recent decades in many high-resource countries, but at different magnitudes [1–5]. Italy is one of the countries showing the highest and still growing age-standardised incidence rates (ASR) worldwide [3,6,7], with a nearly 10% annual average increase from 1991–1995 (ASR = 8/100,000 women) to 2001–2005 (ASR = 18/100,000 women) [8]. TC incidence rates in 2008–2012 from 128 European cancer registries (CRs) have been recently published in the last edition of Cancer Incidence in Five Continents monograph [7], which reported the highest TC incidence in Europe by Italian registries. Moreover,

GLOBOCAN [6] estimated TC incidence in Europe at national level in 2012, showing for Italy the highest TC incidence in men and the second highest in women, after Lithuania (Appendix A).

Similar to the large heterogeneity observed among [3,9] and within countries [2,10–12], a large and growing variation in TC incidence rates exists across Italian regions [13,14]. In contrast, TC mortality rates have been very low in Italy (0.3–0.4/100,000 in men and women, age-standardised to the world standard population) and stable or declining in almost all other high-income countries [5,6,15].

It is unlikely that exposure changes of known [16–19] or unknown risk factors could explain the observed

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