

RESEARCH ARTICLE

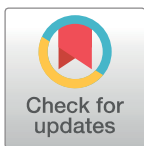
# Overdiagnosis and overtreatment of thyroid cancer: A population-based temporal trend study

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## Abstract

### Background

The increase in incidence of thyroid cancer during the last decades without concomitant rise in mortality may reflect the growing detection of indolent forms of thyroid cancer, and may have fueled unnecessary thyroidectomies. Our aim was therefore, to compare recent secular trends in surgical intervention rate for thyroid cancer with the incidence and mortality of thyroid cancer to assess overdiagnosis and resulting overtreatment.

### Methods

We conducted a population-based temporal trend study in Switzerland from 1998 to 2012. All cases of invasive thyroid cancer, deaths from thyroid cancer, and cancer-related thyroidectomies were analyzed. We calculated changes in age-standardized thyroid cancer incidence rates, stratified by histologic subtype and tumor stage, thyroid cancer-specific mortality, and thyroidectomy rates.

### Results

Between 1998 and 2012, the age-standardized annual incidence of thyroid cancer increased from 5.9 to 11.7 cases/100,000 among women (annual mean absolute increase: +0.43/100,000/year) and from 2.7 to 3.9 cases/100,000 among men (+0.11/100,000/year). The increase was limited to the papillary subtype, the most indolent form of thyroid cancer. The incidence of early stages increased sharply, the incidence of advanced stages increased marginally, and the mortality from thyroid cancer decreased slightly. There was a three- to four-fold increase in the age-standardized annual thyroidectomy rate in both sexes.

### Conclusions

We observed a large increase in the incidence of thyroid cancer, limited to papillary and early stage tumors, with a three- to four-fold parallel increase in thyroidectomy. The mortality

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slightly decreased. These findings suggest that a substantial and growing part of the detected thyroid cancers are overdiagnosed and overtreated.

### **Impact**

Targeted screening and diagnostic strategies are warranted to avoid overdetected and unnecessary treatment of thyroid cancers.

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