

# Analysis of the rising incidence of thyroid cancer using the Surveillance, Epidemiology and End Results national cancer data registry

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**Background.** The incidence of thyroid cancer has more than doubled in recent decades. Debate continues on whether the increasing incidence is a result of an increased detection of small neoplasms or other factors.

**Methods.** Using the Surveillance, Epidemiology and End Results database, we examined the overall incidence of thyroid cancer with variations based on tumor pathology, size, and stage, as well as the current surgical and adjuvant therapy of thyroid carcinoma.

**Results.** Thyroid cancer incidence increased 2.6-fold from 1973 to 2006. This change can be attributed primarily to an increase in papillary thyroid carcinoma, which increased 3.2-fold ( $P < .0001$ ). The increase in papillary thyroid carcinoma also was examined based on tumor size. Tumors  $\leq 1$  cm increased the most at a total of 441% between 1983 and 2006 or by 19.2% per year, the incidence of papillary thyroid carcinoma also increased at 12.3%/year in 1.1–2-cm tumors, 10.3%/year in 2.1–5-cm tumors, and 12.0%/year for  $>5$ -cm tumors (all  $P < .0001$  by Cochran–Armitage trend test). We also demonstrated a positive correlation between papillary thyroid carcinoma tumor size and stage of disease (Spearman,  $r = 0.285$ ,  $P < .0001$ ). Operative treatment for thyroid cancer also has shifted with total thyroidectomy replacing partial thyroidectomy as the most common surgical procedure.

**Conclusion.** Contrary to other studies, our data indicate that the increasing incidence of thyroid cancer cannot be accounted for fully by an increased detection of small neoplasms. Other possible explanations for the increase in clinically significant ( $>1$  cm) well-differentiated thyroid carcinomas should be explored. (Surgery 2010;148:1147-53.)

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IN RECENT DECADES, THE INCIDENCE OF THYROID CANCER has more than doubled in much of the developed world, including the United States,<sup>1</sup> Canada,<sup>2</sup> France,<sup>3</sup> and Australia.<sup>4</sup> Since the 1990s, thyroid cancer has become the fastest increasing cancer in women,<sup>5</sup> whereas the incidence of other neoplasms like lung, colon, and breast cancer has decreased.<sup>6</sup> Thyroid cancer remains the most common endocrine malignancy and accounts for 2.5% of all human cancers.<sup>6</sup>

Numerous studies have described the increasing incidence of thyroid cancer; however, debate continues on whether these findings reflect a true increase of relevant disease or simply an improved diagnostic surveillance or pathologic recognition of incidental neoplasms with little clinical significance. Some groups have proposed that the increasing use of cervical ultrasonography and fine needle aspiration contributes to the identification of clinically unimportant cancers. If this theory is true, then a greater proportion of earlier stage cancers should be noted. Davies and Welch support this theory by showing that neoplasms  $\leq 1$  cm representing micropapillary thyroid cancer (microPTC) accounted for 49% of the overall increase of thyroid cancer in their study.<sup>1</sup> They did not, however, do any correlation of tumor size to stage of disease. A second report by Kent et al drew similar conclusions based on data demonstrating that

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