

# Thyroid cancer – trends by sex, age and histological type

## NCIN Data Briefing

### Introduction

Thyroid cancer accounts for less than 1% of all new cancer diagnoses in England. Although it is rare, it is the most common form of endocrine tumour. Thyroid cancer is around three times more common in women than in men. Patients under 45 years of age and those aged 45 or over can have different prognosis for tumours of similar characteristics<sup>1</sup>. Thyroid cancers usually have one of the main four histologies: papillary, follicular, medullary or anaplastic. This briefing examines trends in the incidence, mortality and one-year relative survival in England by sex, age and histological type for people who were diagnosed with, or died from, thyroid cancer between 1990-94 and 2006-10.

#### KEY MESSAGES:

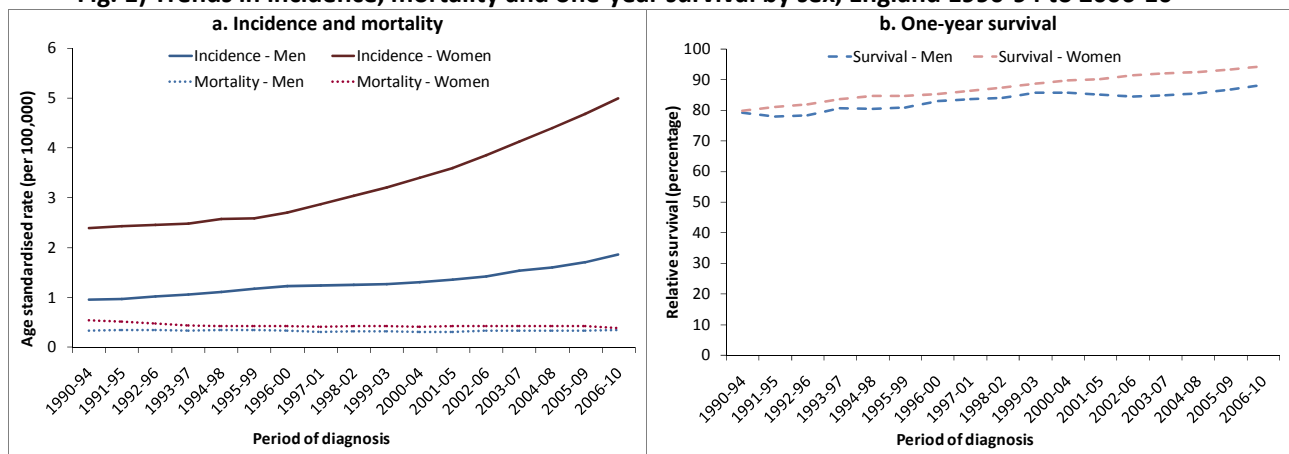
The incidence of thyroid cancer in England doubled over the last 20 years. The death rate has decreased in women over the same time period but has not changed in men. Most of the increase in incidence has been in one sub type known as papillary cancer, which has the best prognosis. This is thought to be largely due to increased detection of small papillary cancers associated with the more widespread use of ultrasound and fine needle biopsies.

### Trends by sex

The rate of new thyroid cancer diagnoses for men and women doubled between 1990-94 and 2006-10. A sharper rise in the incidence was recorded for women from about 1996-00 (Fig. 1a). There were around three times more cancers in women than in men throughout the study period, with 671 average cases per year for women and 233 for men (1990-94) rising to 1427 and 521 respectively (2006-10).

The death rate from thyroid cancer between 1990-94 and 2006-10 significantly decreased in women showing a nearly 30% fall but did not change significantly in men (Fig. 1a).

Fig. 1) Trends in incidence, mortality and one-year survival by sex, England 1990-94 to 2006-10

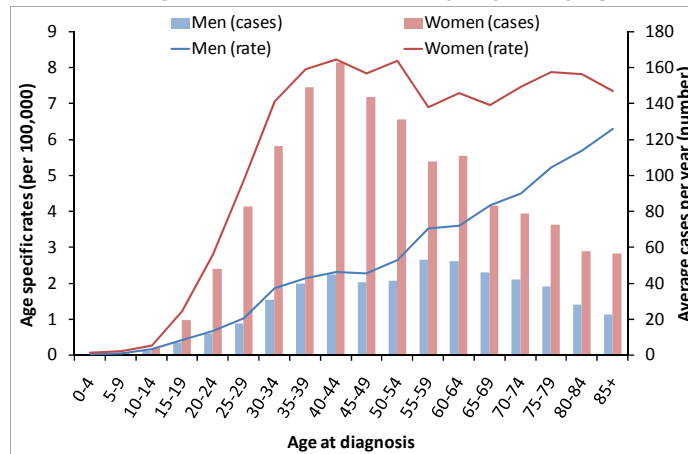


A significant improvement, however, was recorded in one-year relative survival for both men and women (Fig. 1b). For men, survival increased from 79.2% for 1990-94 diagnoses to 88.3% for 2006-10. For women, the improvement in survival was greater, increasing from 79.9% to 94.3%. The one-year survival rate for women in 2006-10 was significantly higher than the rate for men.

### Trends by age

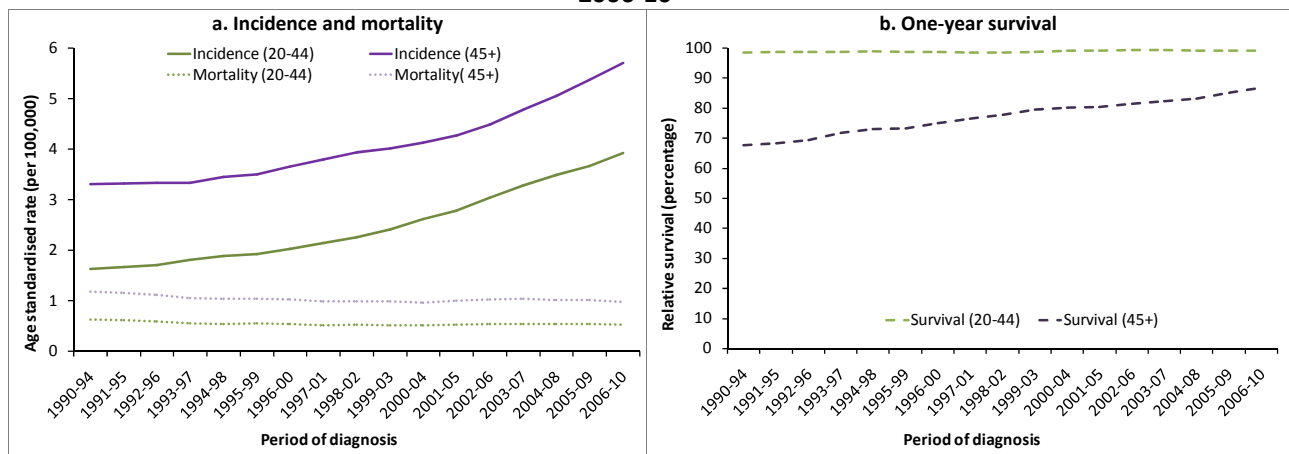
For women diagnosed with thyroid cancer between 2006 and 2010, the incidence rate peaked for ages 40-44 years and then remained at about the same level (Fig. 2). In men, the incidence rate increased steadily with age. The number of thyroid cancer diagnoses in individuals under 20 years of age was low.

Fig. 2) Incidence rates and average number of new cases per year by age and sex, England 2006-10



Throughout the study period, incidence and mortality were significantly lower for the age group 20 to 44 than for those aged 45 or older. The incidence rate for the younger age group increased by 140% between 1990-94 and 2006-10, compared to a 72% increase for the older age group (Fig. 3a). The death rate fell significantly for both age groups by more than 15%.

Fig. 3) Trends in incidence, mortality and one-year survival by selected age groups, England 1990-94 to 2006-10



One-year survival for those aged 20-44 at diagnosis was very high throughout the study period at about 99% (Fig 3.b). For those aged 45 and over, one-year relative survival improved significantly from 67.8% for 1990-94 diagnoses to 86.9% for patients diagnosed in 2006-10. Exclusion of other or unspecified

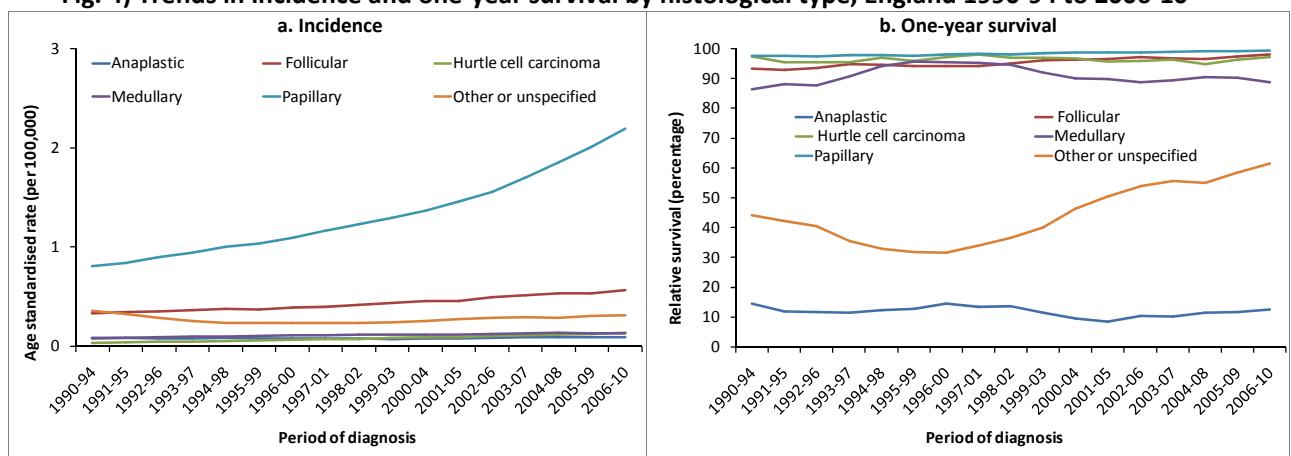
tumour types for patients 45 and older, resulted in significantly higher one-year relative survival of 92% for this age group, compared to 87% for all tumours in 2006-10 (Fig. 3b). One-year survival for patients aged 20 to 44 remained unchanged.

### Trends by histological type

The most common form of thyroid cancer was the papillary sub-type (Fig. 4a). Between 1990-94 and 2006-10 the incidence rate of papillary thyroid cancer increased by 170%.

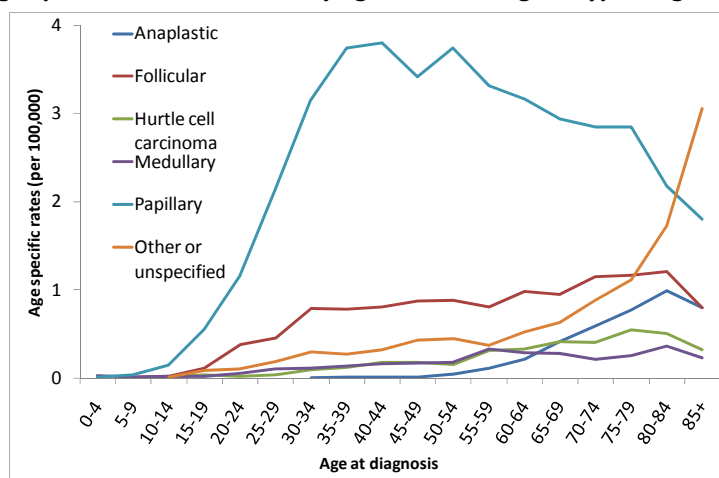
Papillary tumours had the highest one-year survival rate and this significantly increased from 97.7% for patients diagnosed between 1990 and 1994 to 99.5% for 2006-10 diagnoses (Fig. 4b). The lowest one-year survival rate was for anaplastic thyroid cancers and this remained largely unchanged at about 15% throughout the study period. Thyroid cancers that were of other or unspecified type showed the largest improvement in one-year survival increasing from 44% in 1990-94 to 61% in 2006-10.

**Fig. 4) Trends in incidence and one-year survival by histological type, England 1990-94 to 2006-10**

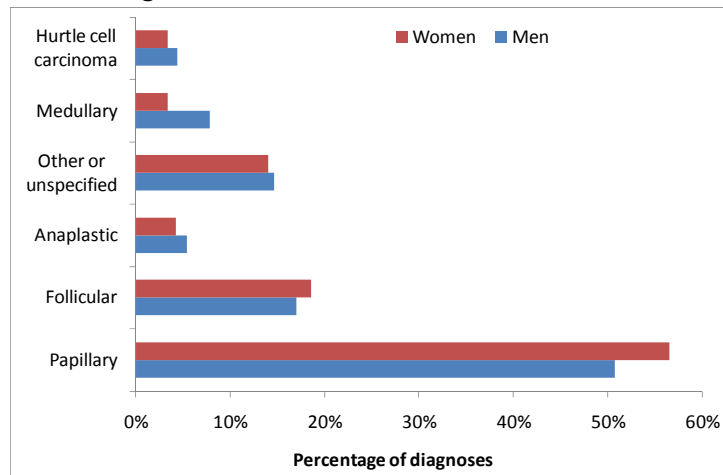


The incidence for papillary sub-type was highest for those aged between 30 and 54 and the rate decreased with age (Fig. 5). For all other sub-types, incidence rates generally increased with age. Thyroid cancers that were of other or unspecified type showed the steepest increase for patients aged 75 years or older and were more likely to be based on a clinical diagnosis only.

**Fig. 5) Age specific incidence rates by age and histological type, England 2006-10**



**Fig. 6) Percentage of thyroid cancer diagnoses by histological type and sex, England 1990 to 2010**



The proportion of thyroid cancers diagnosed between 2006 and 2010 by histological sub-type varied between women and men. Women showed a significantly higher percentage of papillary (56% vs. 51%) and follicular cancers (19% vs. 17%) compared to men (Fig. 6). Men had a significantly higher proportion of anaplastic (5% vs. 4%), medullary (8% vs. 3%) and hurtle cell carcinoma sub-types (4% vs. 3%) compared to women.

## Summary

- The incidence of thyroid cancer for men and women in England approximately doubled between 1990-94 and 2006-10. An increasing incidence of thyroid cancer has also been reported in many other parts of the world<sup>ii</sup>.
- Most of the increase in incidence has been in one sub type known as papillary cancer, which has the best prognosis. This is thought to be largely due to increased detection of small papillary cancers associated with the more widespread use of ultrasound and fine needle biopsies<sup>iii</sup>.
- Thyroid cancer is three times as common in women as in men and the age distribution between the sexes is very different.
- The one -year survival rate for men improved by 11% and for women by 18% over the study period.
- One -year survival in the 20-44 year age group was very high at around 99%. The one-year survival rate for the age group 45 and over improved over the study period and was 87% for cases diagnosed in 2006-10.
- Papillary cancer has the best one-year survival rates at 99.5% for cases diagnosed in 2006 -2010. Anaplastic cancer has the lowest one -year survival rate at about 15%.

## References

- <sup>i</sup> Haymart M.R. Understanding the Relationship Between Age and Thyroid Cancer. *The Oncologist* 2009; **14**: 216-221.  
<sup>ii</sup> Kilfoy B.A. *et al.* International patterns and trends in thyroid cancer incidence, 1973-2002. *Cancer Cause Control* 2009; **20**: 525-531.  
<sup>iii</sup> Davis L. and Welch H.G. Increasing Incidence of Thyroid Cancer in the United States, 1973-2002. *Journal of the American Medical Association* 2006; **295**: 2164-2167.

## FIND OUT MORE:

Oxford Cancer Intelligence Unit (OCIU)

Oxford Cancer Intelligence Unit is the lead Cancer Registry for head and neck cancers

<http://www.ociu.nhs.uk/>

## Other useful resources within the NCIN partnership:

Cancer Research UK CancerStats – Key facts and detailed statistics for health professionals

<http://info.cancerresearchuk.org/cancerstats/>

The National Cancer Intelligence Network is a UK-wide initiative, working to drive improvements in standards of cancer care and clinical outcomes by improving and using the information collected about cancer patients for analysis, publication and research. Sitting within the National Cancer Research Institute (NCRI), the NCIN works closely with cancer services in England, Scotland, Wales and Northern Ireland. In England, the NCIN is part of the National Cancer Programme.