Long-term trends in melanoma tumour thickness in Norway

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# Background

Melanoma skin cancer has been increasing in the white population. Norway ranks fifth in incidence and has the second highest mortality rate worldwide. Many studies have been suggesting over-diagnosis as the cause for the recent rise in melanoma but separating the true increase from the over-diagnosis is not simple. Recently digitized tumour thickness data from 1980 to 2007 has enabled the possibility to analyse the long-term trend of melanoma tumour thickness in Norway. Tumour thickness at diagnosis is the primary determinant of the T-category, and this study aims to investigate the melanoma trend corresponding to T-categories in a nationwide setting with case series over a 40-year period.

# Methods

This study uses 47,439 morphologically verified first primary invasive melanoma cases from 1980 to 2019 together with covariates such as sex, age, anatomic site, histopathological subtype and ulceration. Frequencies, proportion and medians are used for descriptive summaries. Age-adjusted incidence trends were analysed using the segmented regression that identified the significant changes in the trend as join-points. Summary measure of the trend is assessed using annual percentage change (APC) in/for each segment and overall.

# Results

More women were diagnosed with thinner tumours than men. In two periods 1980-1999 and 2008-2019, median tumour thickness decreased from 1.4mm to 1mm in men and 1mm to 0.9 mm in women. After Norwegian melanoma registry (NMR) established in 2008, the proportion of the missing in both ulceration and tumour thickness decreased drastically.

T1-category has the most contribution to the plateau seen in overall incidence between 1993 and 2006. This category has the highest age standardized incidence rate (ASIR) with women having higher rates than men over the years. Men have higher ASIR than women and the difference is widening over the years. The APC for T1 was 7.23 in men and 6.1 in women for the entire period 1980-2019. Although less pronounced, the incidence for thicker tumours (>2mm) have also increased. The APC of T4 tumours were 3.76 in men, 3.01 in women and 3.03 overall.

# Conclusions

Although the plateau seen in thin category need further investigation, there is clear evidence that T1 has the largest incidence with sharp increasing trend indicating the over-diagnosis due to melanoma awareness. However, a strong increasing trend in cases with thicker tumours suggests that the rise in melanoma and its mortality is not only due to over-diagnosis. Awareness focused on elderly male would be effective for early detection and consequently help to reduce both incidence and mortality of melanoma in Norway.

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