The association between melanoma Breslow thickness and long-term patient survival: an Australian population-based analysis

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Background

The prognosis of a patient with a primary cutaneous melanoma is known to be related to its Breslow thickness. Thickness is categorised to guide patients' management according to the internationally-accepted melanoma staging system published by the American Joint Committee on Cancer (**AJCC**) and endorsed by the International Union Against Cancer (**UICC**). This system is updated periodically, most recently with publication of the 8th Edition of the **AJCC** staging manual.

Objectives

➤ This study aimed to determine the **long-term** (30-year) relationship between Breslow thickness and survival outcomes.

➤ To assess the relative effect of a 0.8mm Breslow thickness threshold with respect to the incidence of both melanoma-related and non-melanoma-related death.

➤ The association between the risks of melanoma-death and non-melanoma death for **each 0.1mm increase** in Breslow thickness from 0.1mm to 1.0mm was described.

Methods

➤ **Registry data for all Australians diagnosed with thin invasive primary melanomas between 1982 and 2014 were analysed.**

➤ The cohort consisted of data for **210,042** patients including **144,447** patients with thin (**≤1.0mm in thickness**) melanomas.

➤ The primary outcomes included: incidence of **melanoma-related death**, incidence of **non-melanoma-related death**, **melanoma-specific survival** (**MSS**) and **overall survival** (**OS**).

➤ The **Kaplan-Meier** method and **cumulative incidence function curves** were used to describe outcomes.

➤ **Multivariable Fine & Gray model[1]** and a **Cox model[2]** were simultaneously performed.

➤ **Subgroup analyses** were conducted for **sex, age** (18-25 years, 26 to 50 years, 51 to 75 years and >75 years), and **anatomic site** (head & neck, trunk, lower limb, and upper limb).

Results

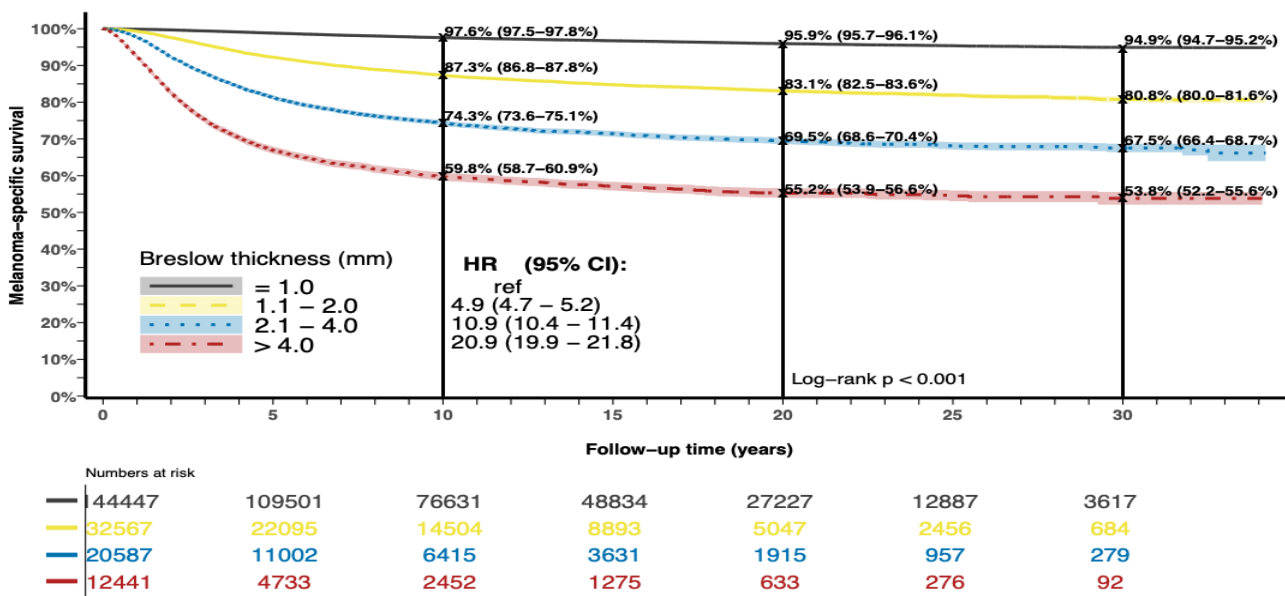**Figure 1: Melanoma-Specific Survival stratified by T-category**

Figure 2: Cumulative Incidence function of Melanoma-related death stratified by T-category
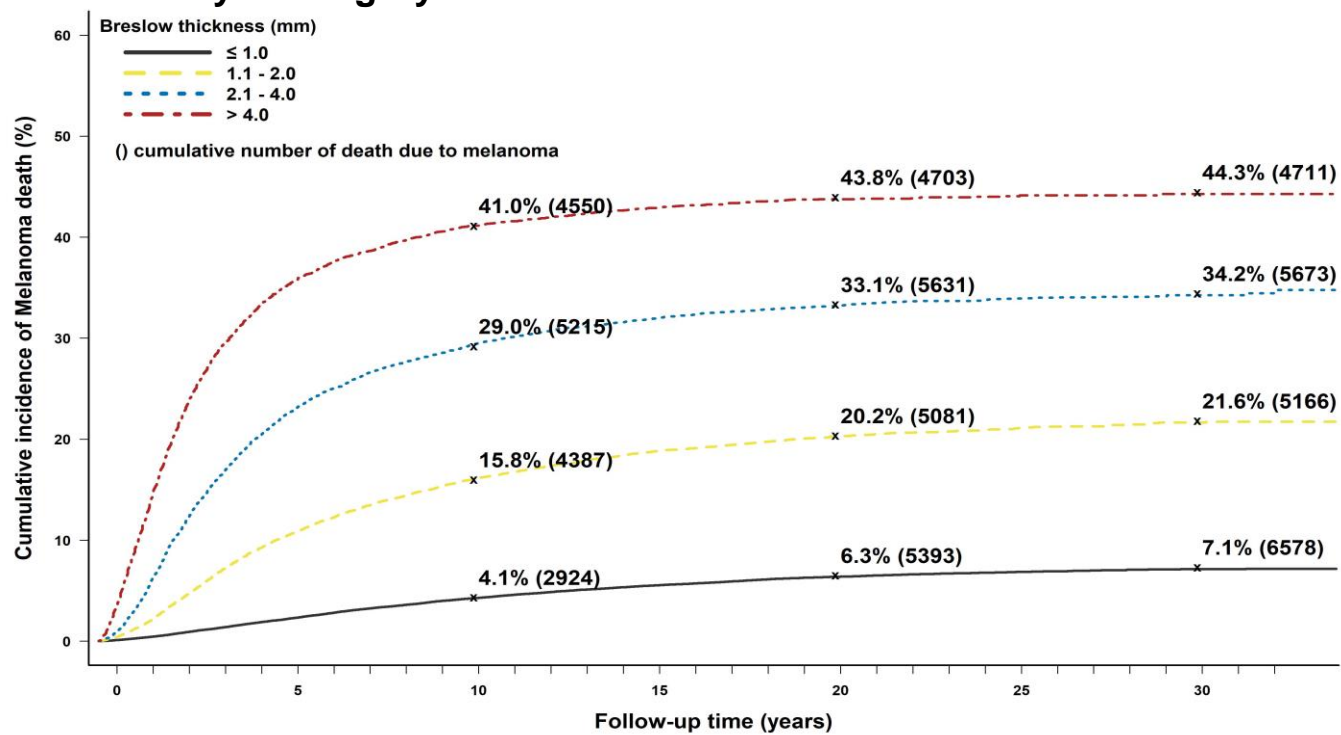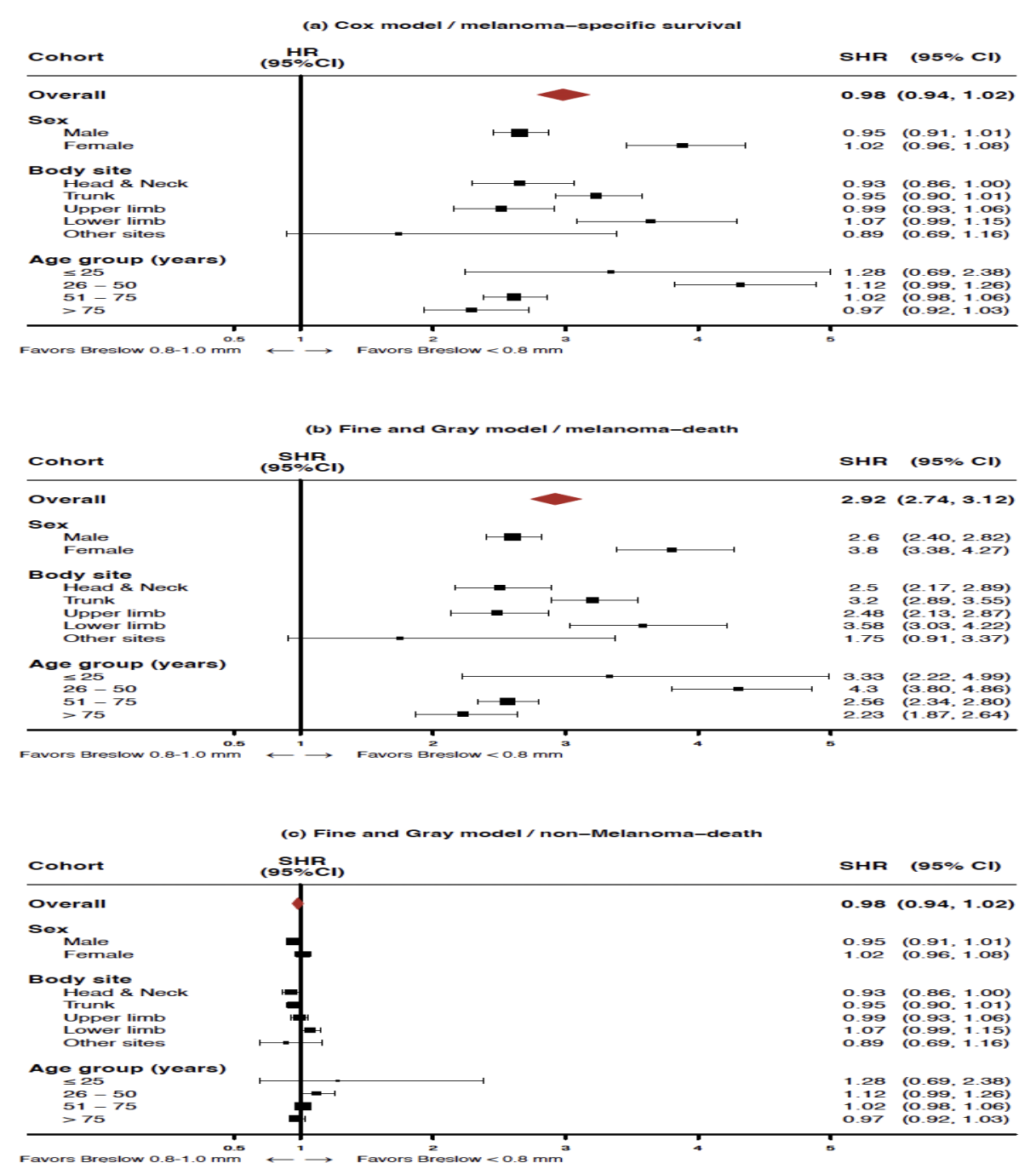

Figure 3: Effects of a 0.8mm threshold (overall and subgroup) on: (a) MSS, (b) melanoma-death and (c) non-melanoma-death

Conclusions

❖ **A plateau** in melanoma-related deaths occurred in T4 patients after **20 years but there were ongoing melanoma-related deaths for the other T-categories beyond 30 years.**

❖ A progressive rise in the risk of death from other causes occurred across all T-categories.[3]

❖ The risk of melanoma-related death **increases significantly** for patients with primary tumors **0.8-1.0mm** in thickness.

❖ The risk of death from non-melanoma causes was similar across Breslow thicknesses of 0.1 to 1.0mm.

❖ This analysis confirms the importance of a 0.8mm threshold for guiding the care of patients with thin primary melanomas.[4]

References

1. Fine, J.P. and R.J. Gray, A proportional hazards model for the subdistribution of a competing risk. Journal of the American statistical association, 1999. **94**(446): p. 496-509.

2. Cox, D. and D. Oakes, Analysis of survival data. 1984.

3. Lo SN, Williams GJ, Cust AE, Varey AHR, Md SC, Scolyer RA, Thompson JF. Long-Term survival across breslow thickness categories: Findings from a Population-Based study of 210,042 Australian melanoma patients. J Natl Cancer Inst. 2024 Sep 9:djae198. doi: 10.1093/jnci/djae198. Epub ahead of print. PMID: 39245462

4. Lo S.N., Williams G.J., Anne E Cust A.E., Ollila D.W., Varey A.H.R., Ch'ng S., Scolyer R.A., Thompson J.F. (2024), "Risk of death due to melanoma and other 1 causes in patients with thin (T1) cutaneous melanomas: competing- risk analysis of a large, population-based cohort", JAMA Dermatology

Acknowledgements