

A Large Linked Study to Evaluate the Future Burden of Cancer in Australia Attributable to Current Modifiable Behaviours

Laaksonen, MA¹, Arriaga, ME¹, Canfell, K², MacInnis, R³, Hull, P¹, Banks, E⁴, Giles, GG², Mitchell, P⁵, Cumming, RG⁵, Byles, JE⁶, Magliano, DJ⁷, Shaw, J⁷, Taylor, A⁸, Gill, TK⁸, Hirani, V⁵, Marker, J⁹, McCullough, S¹⁰, Velentzis, LS², and Adelman, B-A¹

¹University of New South Wales

²Cancer Council New South Wales

³Cancer Council Victoria

⁴Australian National University

⁵University of Sydney

⁶University of Newcastle

⁷Baker Heart and Diabetes Institute

⁸University of Adelaide

⁹Cancer Voices South Australia

¹⁰Lung Foundation Australia

Introduction

The cancer burden preventable through modifications to risk factors can be quantified by calculating their population attributable fractions (PAFs). PAF estimates require large, prospective data to inform risk estimates and contemporary population-based prevalence data to inform the current exposure distributions, including among population subgroups.

Objectives and Approach

We provide estimates of the preventable future cancer burden in Australia using large linked datasets. We pooled data from seven Australian cohort studies (N=367,058) and linked them to national registries to identify cancers and deaths. We estimated the strength of the associations between behaviours and cancer risk using a proportional hazards model, adjusting for age, sex, study and other behaviours. Exposure prevalence was estimated from contemporary National Health Surveys. We harmonised risk factor data across the data sources, and calculated PAFs and their 95% confidence intervals using a novel method accounting for competing risk of death and risk factor interdependence.

Results

During the first 10-years follow-up, there were 3,471 incident colorectal cancers, 640 premenopausal and 2,632 postmenopausal breast cancers, 2,025 lung cancers and 22,078 deaths. The leading preventable causes were current smoking (53.7% of lung cancers), body fatness or BMI $\geq 25\text{kg/m}^2$ (11.1% of colorectal cancers, 10.9% of postmenopausal breast

cancers), and regular alcohol consumption (12.2% of premenopausal breast cancers). Three in five lung cancers, but only one in four colorectal cancers and one in five breast cancers, were attributable to modifiable factors, when we also considered physical inactivity, dietary and hormonal factors. The burden attributable to modifiable factors was markedly higher in certain population subgroups, including men (colorectal, lung), people with risk factor clustering (colorectal, breast, lung), and individuals with low educational attainment (breast, lung).

Conclusion/Implications

Estimating PAFs for modifiable risk factors across cancers using contemporary exposure prevalence data can inform timely public health action to improve health and health equity. Testing PAF effect modification may identify population subgroups with the most to gain from programs that support behaviour change and early detection.

