

Relationship of tobacco smoking to cause-specific mortality: Estimates of smoking attributable deaths in Australia

P3
C12

Grace Joshy¹, Katherine A Thurber¹, Kay Soga¹, Amelia Yazidjoglou¹, Sam Egger², Marianne F Weber², Peter Sarich², Jennifer Welsh¹, Rosemary J Korda¹, Ellie Paige^{1,3,4}, Karen Canfell², Emily Banks¹

¹National Centre for Epidemiology and Population Health, Australian National University, Canberra, Australia, ²The Daffodil Centre, A Joint Venture with Cancer Council NSW, The University of Sydney, Sydney, Australia, ³Population Health Program, QIMR Berghofer Medical Research Institute, Brisbane, Australia, ⁴School of Public Health, University of Queensland, Brisbane, Australia

A total of **24,285 (15.3%)** deaths in the Australian population in 2019 were attributable to tobacco smoking – 11,283 (23.3%) among 45–74-year-olds and 13,002 (11.8%) among ≥75-year-olds. Current smoking significantly increased the risk of death from a range of conditions with **excess mortality largely avoided by quitting before 45 years of age.**

BACKGROUND

- Australia has low current smoking prevalence and historic levels of heavy and prolonged smoking.
- Evidence based on local data on smoking and cause-specific mortality, and deaths attributable to smoking in Australia are lacking.

METHODS

- Prospective study of 178,169 cancer-, and cardiovascular-disease-free individuals aged ≥45 years joining the 45 and Up Study from 2005–2009.
- Questionnaire data were linked to hospitalisation, cancer registry and death data to November 2017.
- Confounder adjusted hazard ratios (HR) for cause-specific mortality by smoking status were estimated, including according to smoking intensity and recency.
- Population attributable fractions calculated using the Miettinen formula for multilevel exposures and applied to national cause-specific deaths in Australia in 2019 to estimate the number of attributable deaths.

RESULTS

- There were 13,608 deaths during 9.5y median follow-up (1.68M person-years); at baseline, 7.9% of participants currently and 33.6% formerly smoked.
- Mortality risks were significantly increased for 21 of the 28 causes of death examined. (Figure 1).
- Compared to people who had never smoked, risks were generally at an intermediate level among those who reported former smoking at baseline for many conditions examined, but not significantly elevated for cerebrovascular disease, liver cirrhosis, dementia/Alzheimer's, external causes, cancer of pancreas, kidney, stomach, prostate or large intestine.
- Mortality risks increased with increasing smoking intensity; even "light" smoking (1-14 cigarettes/day) is associated with a 21-fold risk of death from chronic lung disease, a 13-fold risk of death from lung cancer and a 2-fold risk of death from coronary heart disease, compared to never smoking.
- A total of 24,285 (15.3%) deaths at age ≥45 years in 2019 were attributable to current or past smoking - 13.8% to current smoking and 9.5% to past smoking (Figure 2). Attributable deaths were nearly double in men than among women; 15,753 (19.4%) vs 8,532 (11.1%).

CONCLUSIONS

- Smoking continues to cause a substantial proportion of deaths in low-prevalence settings, including Australia. Almost all levels of smoking intensity significantly increased the risk of death from chronic lung disease, coronary heart disease, cerebrovascular disease and lung cancer.
- Quitting at any age reduces risks, with quitting by age 45 years avoiding the bulk of the excess mortality risk.
- Timely and accurate mortality estimates demonstrating large ongoing impacts highlight the importance of accelerated tobacco control.

Figure 1. Hazard ratios (HR) for cause-specific mortality associated with current versus never-smoking

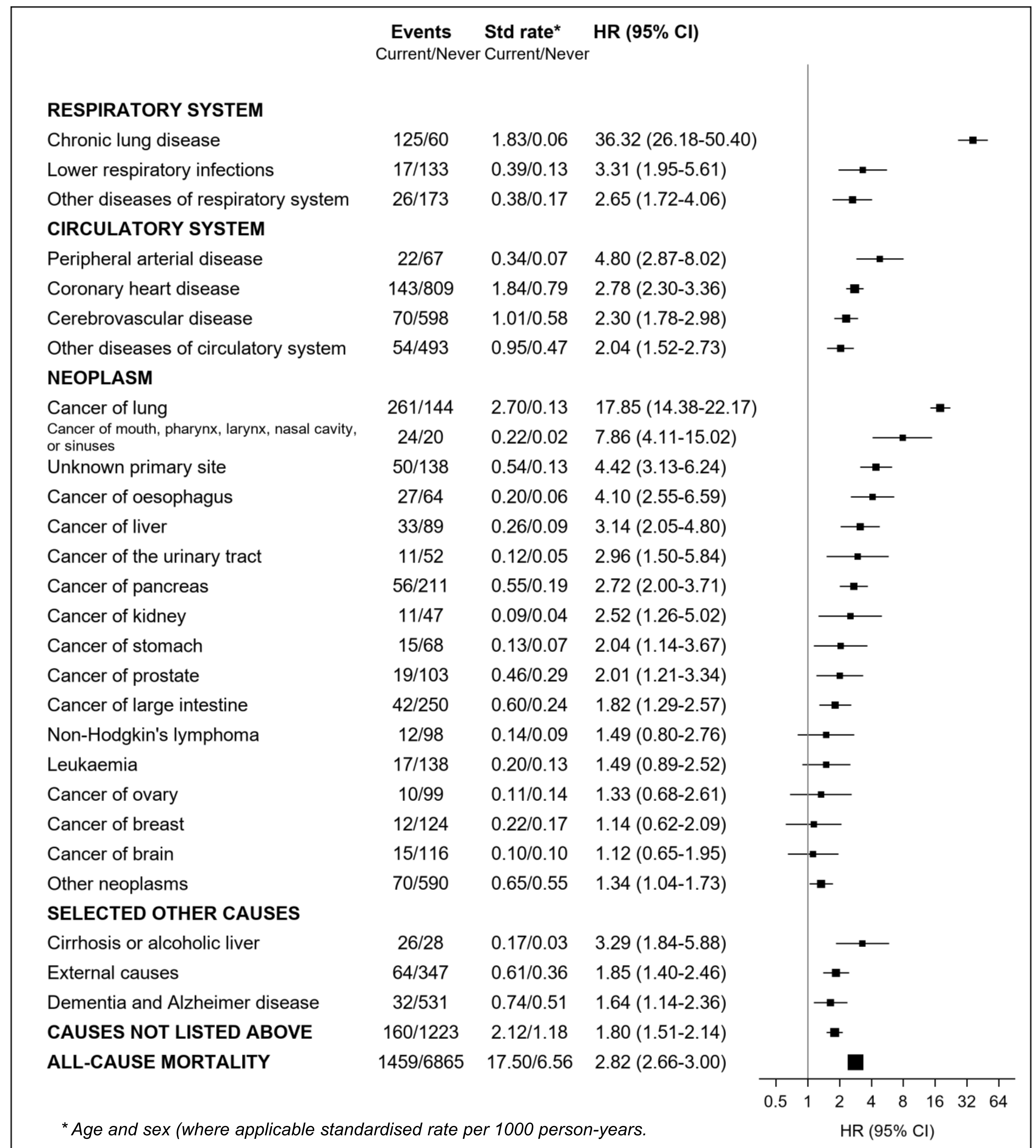
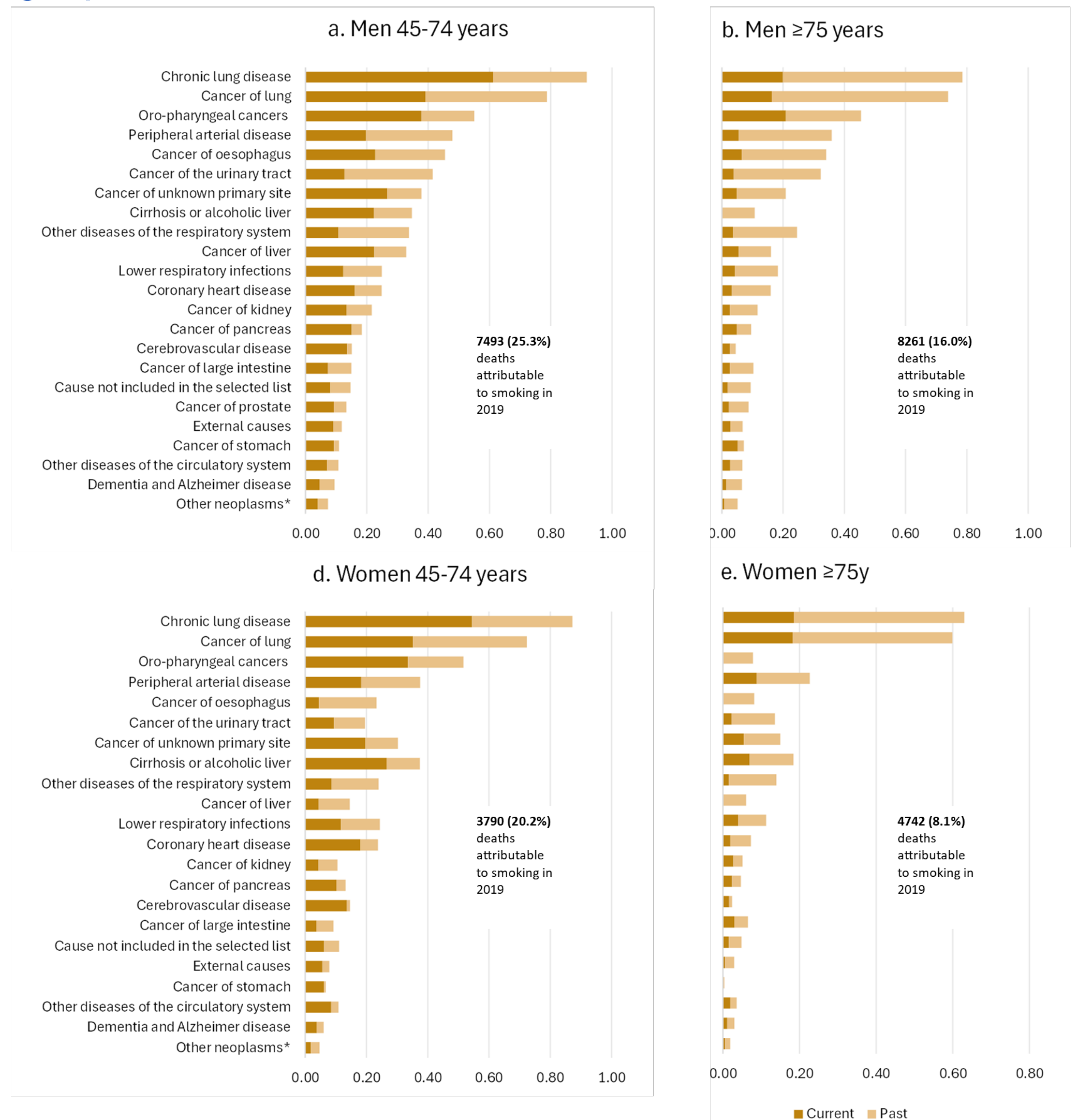


Figure 2. Smoking-attributable fractions for current and past smoking by age group and sex in Australia



Acknowledgements

We thank the many thousands of people participating in the 45 and Up Study. This research was completed using data collected through the 45 and Up Study. The 45 and Up Study is managed by the Sax Institute in collaboration with major partner Cancer Council NSW and partners the Heart Foundation and the NSW Ministry of Health. We thank the Centre for Health Record Linkage (CHeReL) for the provision of linked data. The NSW Admitted Patient Data Collection is provided by the NSW Ministry of Health. The NSW Cancer Registry data is provided by the Cancer Institute NSW. The NSW Registry of Births, Deaths and Marriages is provided by the NSW Ministry of Health. We thank the AIHW for providing summary data on cause specific deaths in Australia. Professor Emily Banks, Associate Professor Katherine Thurber and Professor Karen Canfell receive support from the NHMRC (references: 1136128, 1156276 and 1194679, respectively). Ellie Paige is supported by a Future Leader Fellowship (107210) from the National Heart Foundation of Australia.