A comparison of the cardiovascular safety of quit smoking medicines

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Background

- Smoking cessation pharmacotherapies are the most effective way to help people quit smoking
- Although there have been concerns about the cardiovascular safety of these medicines, there is consensus that any increased risk of adverse cardiovascular events is small and outweighed by the benefits of quitting smoking
- Hence, clinical guidelines specify that smoking cessation pharmacotherapies should be offered to everyone who wants to quit smoking

In the interest of minimising risk to patients, prescribers need evidence on how smoking cessation pharmacotherapies compare in terms of cardiovascular safety

Aim

To compare the risk of major adverse cardiovascular events among individuals initiating varenicline, nicotine patches and bupropion.

Study design

Population-based cohort study using linked pharmaceutical dispensing data, hospital admissions data and death records for residents of NSW

Study population

- We created 3 cohorts to conduct pairwise comparisons of the 3 pharmacotherapies
- We included individuals in a cohort for a pairwise comparison if they initiated their first course of either medicine during the study period
- Study periods varied according to when each of the pharmacotherapies became available in Australia

2008-2015	342,064 varenicline initiators	vs	10,458 bupropion initiators
2011-2015	122,927 varenicline initiators	vs	92,148 nicotine patch initiators
2011-2015	102,817 nicotine patch initiators	vs	6,049 bupropion initiators

We followed these participants until:
- Occurrence of outcome
- Discontinuation or switching of pharmacotherapy
- Death from causes other than the outcome
- End of the data availability (December 2015)

…whichever came first

Outcomes

Primary outcome = Major adverse cardiovascular events (MACE), composite of:
- acute coronary syndrome (ACS)
- stroke
- cardiovascular death

} Secondary outcomes

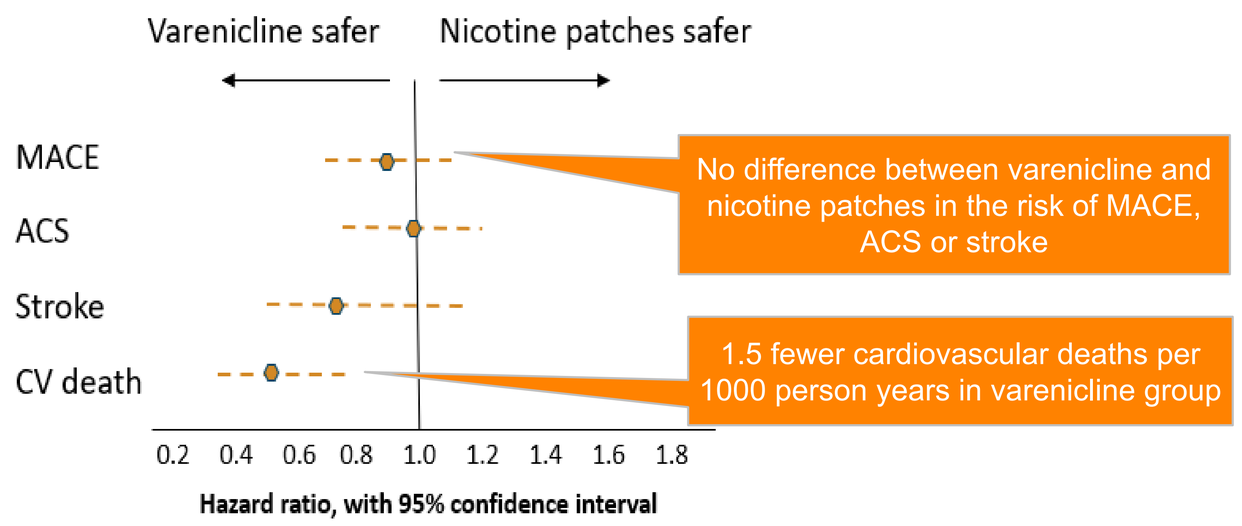
Identified through hospital admission and death records

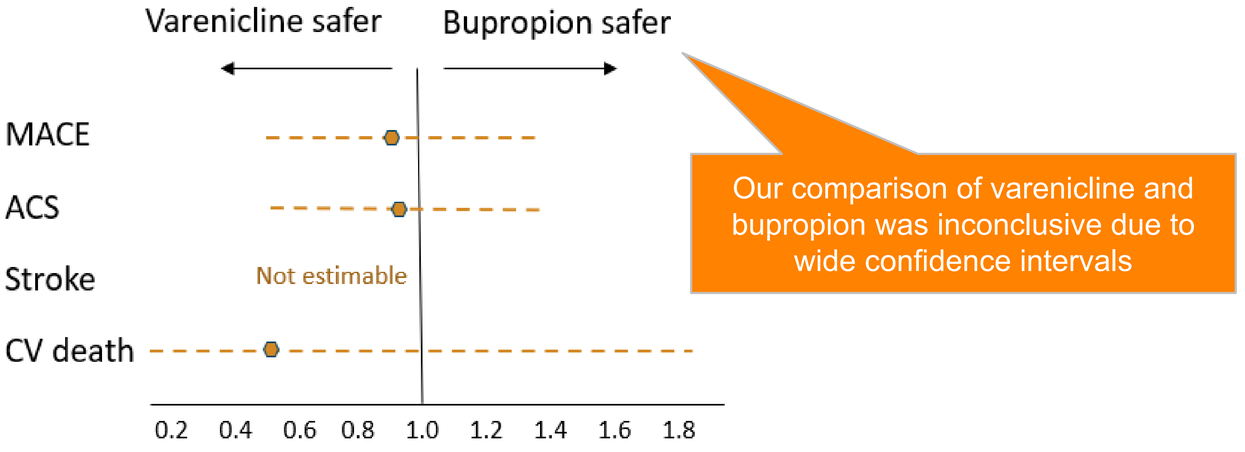
Statistical analysis

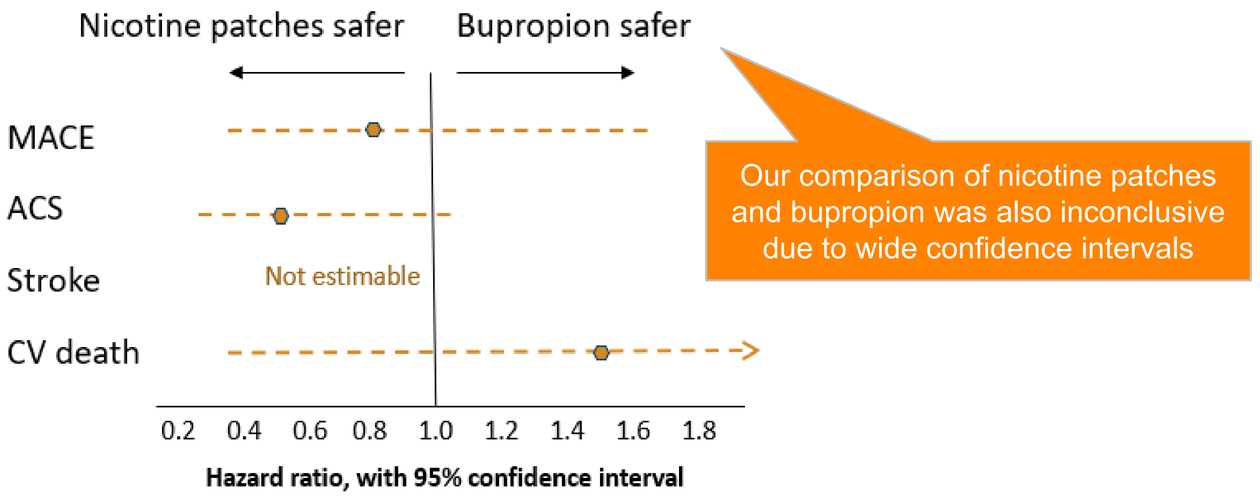
Inverse probability of treatment weighted with high dimensional propensity scores to account for potential confounding from:
- Socio-demographic characteristics
- History or cardiovascular disease
- Wide range of other morbidities and medicine use known to be associated with cardiovascular outcomes and plausibly related to choice of pharmacotherapy

Cox proportional hazard models to estimate hazard ratios with 95% confidence intervals

Results







Implications

- Our findings regarding the comparative safety of bupropion were inconclusive due to limited use
- Varenicline is no more harmful than nicotine patches, and may be even protective against some cardiovascular outcomes
- This is encouraging because varenicline is the most effective of the pharmacotherapies

Varenicline can be prescribed in preference to nicotine patches without increasing patients' risk of major cardiovascular events

This should have the downstream effect of more smoking cessation

Acknowledgements

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