

# Tobacco smoking and the risk of Parkinson disease

## A 65-year follow-up of 30,000 male British doctors

Benjamin Mappin-Kasirer, MSc, Hongchao Pan, DPhil, Sarah Lewington, DPhil, et al.

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### Correspondence

Dr. Clarke  
Robert.clarke@  
ndph.ox.ac.uk

### Study objective and summary result

This study investigated the association between tobacco smoking and risk of Parkinson disease (PD). The results suggest a protective effect of smoking against incident PD.

### What is known and what this paper adds

There is a well-described lower risk of PD among tobacco smokers; however, recent reports have suggested that this may be an artefact of reverse causality bias, whereby individuals with prodromal, pre-clinical PD are less sensitive to nicotine, and consequently less likely to become smokers. This study minimized the effects of reverse causality, thus providing evidence for a causal relationship.

### Participants and setting

Data from 29,737 male British doctors (mean baseline age,  $41.9 \pm 12.6$  years), registered with the British Medical Association in 1951, were analyzed. Recruitment occurred in 1951, and data collection continued until November 2016.

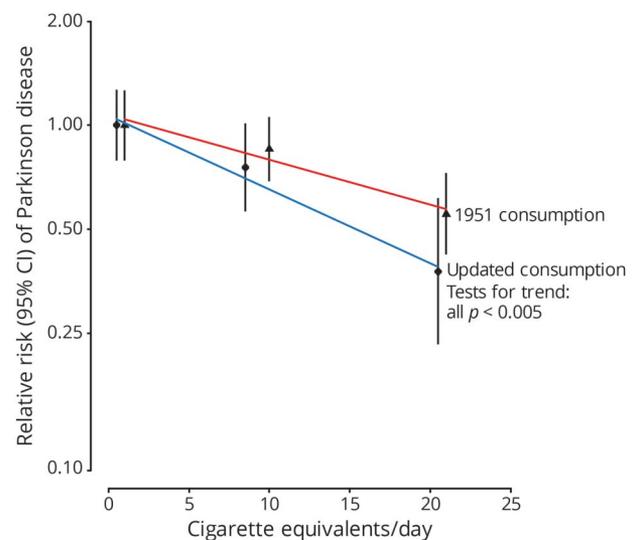
### Design, size, and duration

Participants reported their smoking habits via postal questionnaires at 7 timepoints. National death certificate records were used to identify cases of PD-related death. Cox proportional hazards models were used to assess the association between smoking and death from PD, excluding the first 10 years of follow-up data from all analyses to minimize the effects of reverse causality bias.

### Main results and the role of chance

The prevalence of current smoking among participants declined from 67% to 8% from 1951 to 1998. During follow-up, 283 cases of PD-related death were recorded. Current smokers at baseline in 1951 had a 30% lower risk of PD than never smokers (relative risk 0.71; 95% confidence interval 0.60–0.84) regardless of subsequent changes in smoking habits. Participants who continued smoking during follow-up had a 40% lower risk of PD (RR 0.60, 95% CI 0.46–0.77) compared to never smokers. Risks of PD were inversely associated with the amount of tobacco smoked, and the

**Figure** Associations between the amount of tobacco smoked and the risk of PD-related mortality



protective effect of current smoking on PD risk was attenuated by increasing duration since quitting smoking.

### Bias, confounding, and other reasons for caution

These analyses were based only on 283 cases of PD. Additionally, smoking may not be directly causal for PD: smoking may be associated with other traits or reasons that are causal for PD.

### Generalizability to other populations

The cohort included only male British doctors; however, results are consistent with those from prior Western population-based cohorts including men and women.

### Study funding/potential competing interests

This study was funded by the UK Medical Research Council, the British Heart Foundation, and Cancer Research UK. The authors report no competing interests. Go to [Neurology.org/N](http://Neurology.org/N) for full disclosures.

A draft of the short-form article was written by M. Dalefield, a writer with Editage, a division of Cactus Communications. The corresponding author(s) of the full-length article and the journal editors edited and approved the final version.

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