



INEQUALITIES IN SMOKING PREVALENCE TRENDS BY OCCUPATIONAL GROUP IN ENGLAND

**ANNE ALARILLA
CANCER RESEARCH UK**



CONTENTS

- Background and aims
- Methods
- Results
- Areas for further analysis
- Conclusions

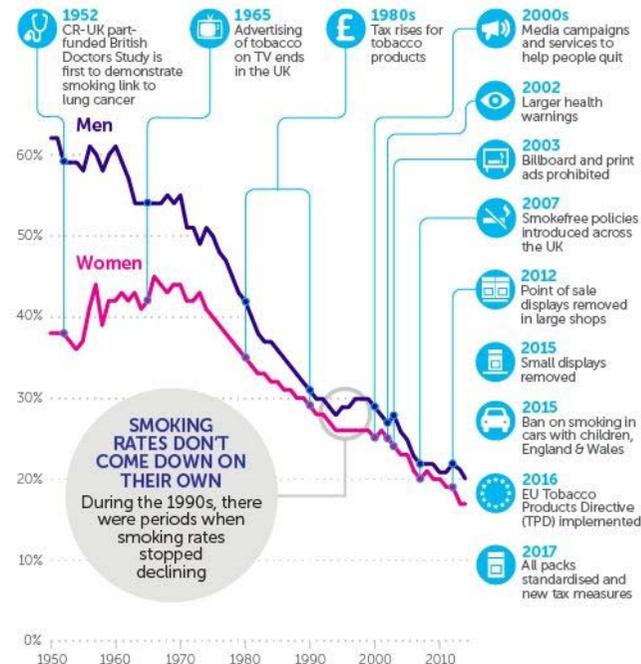
BACKGROUND

SMOKING

- UK's top preventable cause of cancer.
- England smoking prevalence is 14.9% (2017)
- Reduction is vital for reducing cancer incidence and mortality and for tackling health inequalities

3

SMOKING RATES DECLINE WITH ACTION



Source: Adult Smoking Habits in Great Britain, Opinions and Lifestyle Survey, ONS

LET'S BEAT CANCER SOONER
cruk.org



BACKGROUND

SMOKING PREVALENCE TRENDS

- Smoking prevalence trends in England differ by socioeconomic status (SES)
 - The decline between 2001-2008 was not observed amongst the multiply disadvantaged
- Multicomponent measures of SES?

BACKGROUND

SMOKING PREVALENCE TRENDS

- Occupation as a measure of SES
- Routine and manual workers (R&M workers) had more than double the odds of being a smoker compared to other occupations
 - The gap in smoking prevalence between R&M workers and other occupations have significantly widened from 2012 (2.27; 2.21-2.34) to 2017 (2.44; 2.36-2.52).

AIMS OF THE STUDY

- How England's smoking population is distributed across occupation groups from 2001-2015
- How smoking prevalence trends from 2001-2015 differ between occupation groups
- Whether occupation group is linked with smoking status independently of other factors

METHODS

STUDY DESIGN

- Health Survey for England 2001-2015
 - Accessed through UKDA
 - Cross-sectional survey
 - Nationally representative
 - Collected annually about health and lifestyle
 - Complex survey design

METHODS

STUDY DESIGN

- Data Cleaning
 - Occupation (NS-SEC) and smoking variables
 - Covariates
 - Standardizing responses
 - Combining the data set
 - R-scripts available if interested

METHODS

STATISTICAL ANALYSES

- How England's smoking population is distributed across occupation groups from 2001-2015
 - Proportional analyses using confidence intervals to assess significance (using three year average)
- How smoking prevalence trends from 2001-2015 differ between occupation groups
 - Proportional analyses using confidence intervals to assess significance (using three year average)

METHODS

STATISTICAL ANALYSES

- Whether occupation group is linked with smoking status independently of other factors
 - Mixed effects logistic regression
 - Fixed effects: age, sex, ethnicity, marital status, drinking, government region, general perceived health, education, income, year
 - Random effects: random intercept for occupation and random slope for occupation through the years
 - Significance testing using likelihood ratio test

RESULTS

147,791 in the sample

Smoking was associated with:

- Age
- Sex
- Marital status
- Income
- Highest educational qualification
- Government Office Region
- Ethnicity
- Drinking behaviour
- General perceived health

11

STUDY SAMPLE

SAMPLE CHARACTERISTICS

 **101,904** participants in the analysis

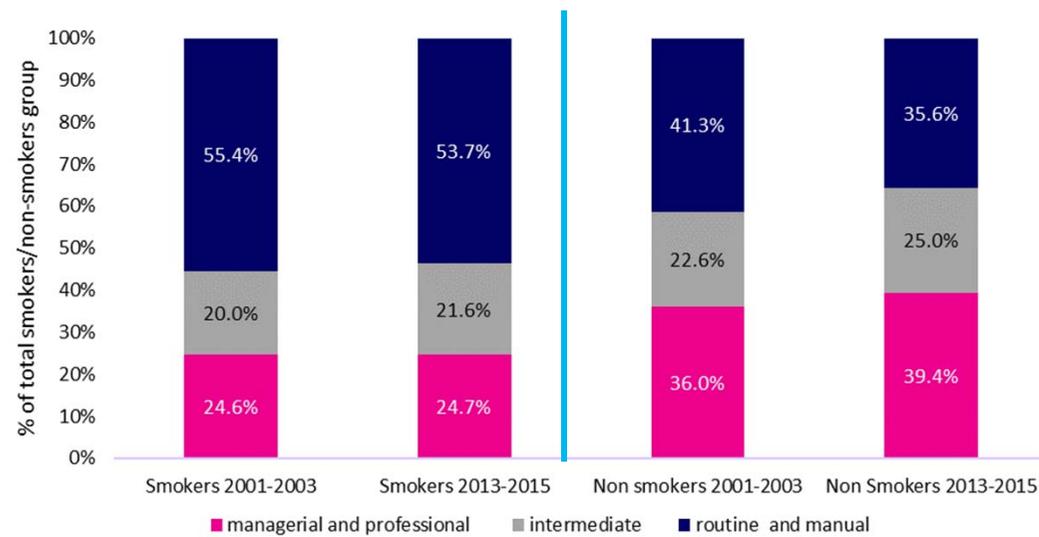
 **22%** identified as a
CURRENT SMOKER

the current smokers were:

 **47% MALE**
 **35-44 YEARS OLD**
was the most common age for current smokers

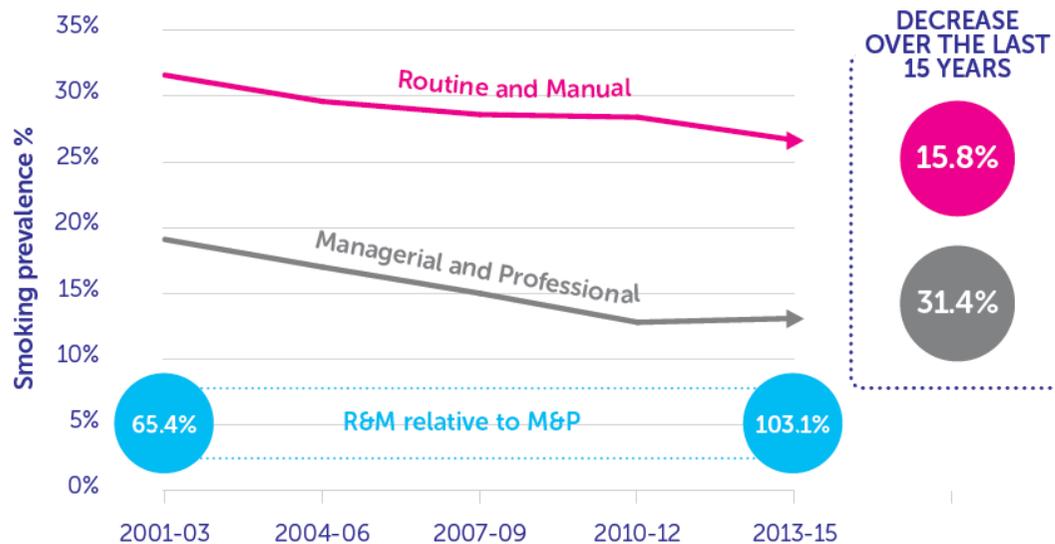
RESULTS

HOW ENGLAND'S SMOKING POPULATION IS DISTRIBUTED ACROSS OCCUPATION GROUPS FROM 2001-2015



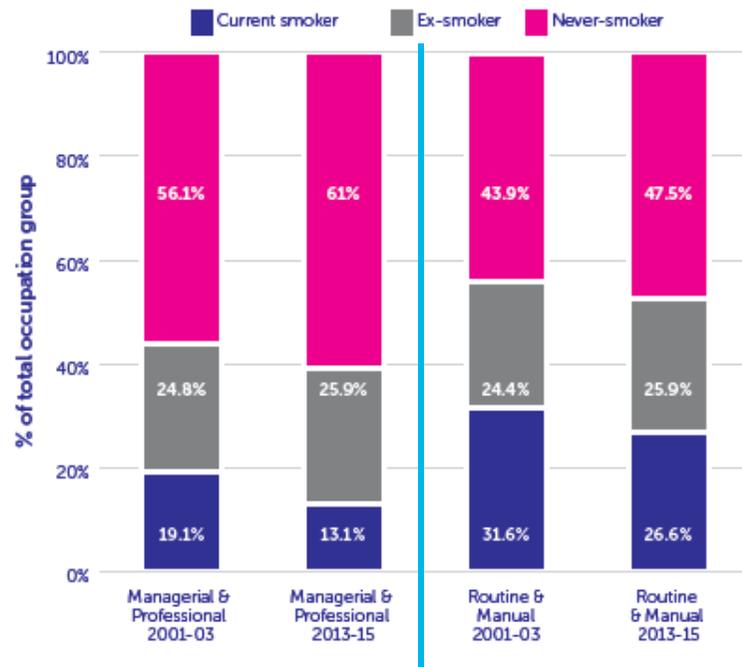
RESULTS

HOW SMOKING PREVALENCE TRENDS FROM 2001-2015 DIFFER BETWEEN OCCUPATION GROUPS



RESULTS

HOW SMOKING PREVALENCE TRENDS FROM 2001-2015 DIFFER BETWEEN OCCUPATION GROUPS



RESULTS

WHETHER OCCUPATION GROUP IS LINKED WITH SMOKING STATUS INDEPENDENTLY OF OTHER FACTORS

Using mixed effects logistic regression

Variable	P-value
Age	p<0.01
Sex	p<0.01
Education	p<0.01
Income	p<0.01
Marital Status	~
Ethnicity	p<0.01
Government Region	~
Drinking	p<0.01
General Perceived Health	p<0.01
Year	p<0.01

RESULTS

WHETHER OCCUPATION GROUP IS LINKED WITH SMOKING STATUS INDEPENDENTLY OF OTHER FACTORS

Using mixed effects logistic regression and likelihood ratio test

- Model 1: fixed effects (age, sex, income, ethnicity, marital status, education, general perceived health, drinking, government region and dinking)
- Model 2: fixed effects with random intercept (occupation)*
- Model 3: fixed effects with random intercept (occupation) and random slope (occupation | year) *

* = $p < 0.005$

RESULTS

IN SUMMARY

- More than half of England's smokers are routine and manual workers
- Likelihood of being a smoker did not decrease as fast in routine and manual workers
- The inequality may be driven by higher rates of smoking uptake and lower than necessary quitting in routine and manual workers
- Occupation group is independently linked to this inequality

FURTHER ANALYSIS

ALSO...

- Overweight and obesity prevalence trends
- Longer time period (2016)
- Difference in sex?

CONCLUSIONS

LIMITATIONS

- No causality
- Reverse causality?
- Not all the covariates could be accounted for
- Missing variables

CONCLUSIONS

DISCUSSION

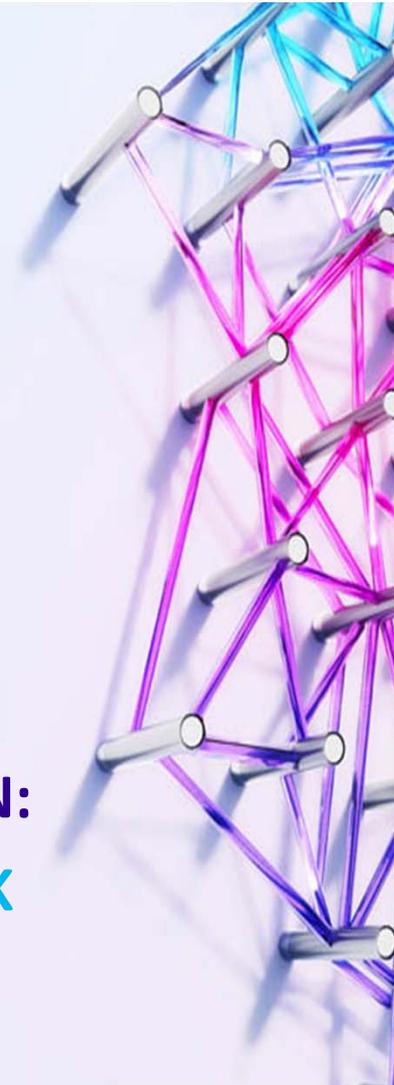
- England's smokers becoming increasingly concentrated in the R&M workforce
- Targeting R&M workers to increase successful quitting and encourage R&M workers to not start smoking.

ACKNOWLEDGEMENTS

- Authors would like to thank Martin Dockrell and Clare Griffiths at Public Health England, and Alison Cox and George Butterworth at Cancer Research UK

THANK YOU FOR LISTENING!

**EMAIL FOR FURTHER INFORMATION:
ANNE.ALARILLA2@CANCER.ORG.UK**



REFERENCES

- Brown KF, Rungay H, Dunlop C, et al. The fraction of cancer attributable to known risk factors in England, Wales, Scotland, Northern Ireland, and the UK overall in 2015. *British Journal of Cancer* 2018.
- Hiscock R, Bauld L, Amos A, Fidler JA, Munafò M (2012a). Socioeconomic status and smoking: a review. *Ann N Y Acad Sci*; 1248: 107-23.
- Kotz D, West R. (2009). Explaining the social gradient in smoking cessation: it's not in the trying, but in the succeeding. *Tob Control*; 18(1): 43-6.
- West, R. (2017). Tobacco smoking: Health impact, prevalence, correlates and interventions. *Psychology & Health*, 32:8, 1018-1036.
- Hiscock R, Bauld L, Amos A, Platt S. (2012b). Smoking and socioeconomic status in England: the rise of the never smoker and the disadvantaged smoker. *J Public Health (Oxf)*; 34(3): 390-6.
- UK Data Archive. Health Survey for England. Available from <https://discover.ukdataservice.ac.uk/series/?sn=2000021>. Accessed January 2018.