

Socioeconomic Variation in COPD Prevalence Among Adult Canadians

Francis Abayateye; Barada Mohanty; Bonnie Janzie; Punam Pahwa

INTRODUCTION

- Chronic obstructive pulmonary disease (COPD) is a progressive respiratory disorder characterized by swollen and partly blocked airways (1).
- Despite it being highly misdiagnosed and undiagnosed (2), COPD is the third leading cause of death globally and responsible for 6% of total death (3).
- In Canada, COPD is the fifth leading cause of death (4)
- It is largely caused by smoking (5-7).
- Other risk factors of COPD include exposure to air pollutants, physical activities, body mass index (BMI), and other comorbidities such as asthma and cardiovascular diseases (8-11).
- Socioeconomic status (SES) is one of the most critical determinants of health, with people of lower SES often experiencing worse health outcomes than those of higher SES (12).
- Individuals exposure to the risk factors of diseases are usually differentiated by their SES (13).

OBJECTIVE

This study is to examine how different socioeconomic status influence the risk factors of COPD. Specifically, this study aim to achieve the following objectives.

- To determined the risk factors of COPD prevalence among adult Canadians
- To determine how the risk factors of CODP vary individual SES

METHODS

Data: This study use the Annual Component of the cross-sectional data from 2017-2018 Canadian Community Health Survey (CCHS) (14)

Assessment of COPD: COPD cases were defined by answering yes to the CCHS question “Do you have chronic bronchitis, emphysema or chronic obstructive pulmonary disease?” Only individuals aged 35 years and older were asked this question.

SES measure:

- Income: low; middle; and high
- Education: low; middle; and high
- Employment status: Employed/unemployed

Statistical Analysis:

- A multivariable logistic regression was used for analysis.
- This allows for the assessment of the independent effect of each risk factor on COPD prevalence

RESULTS

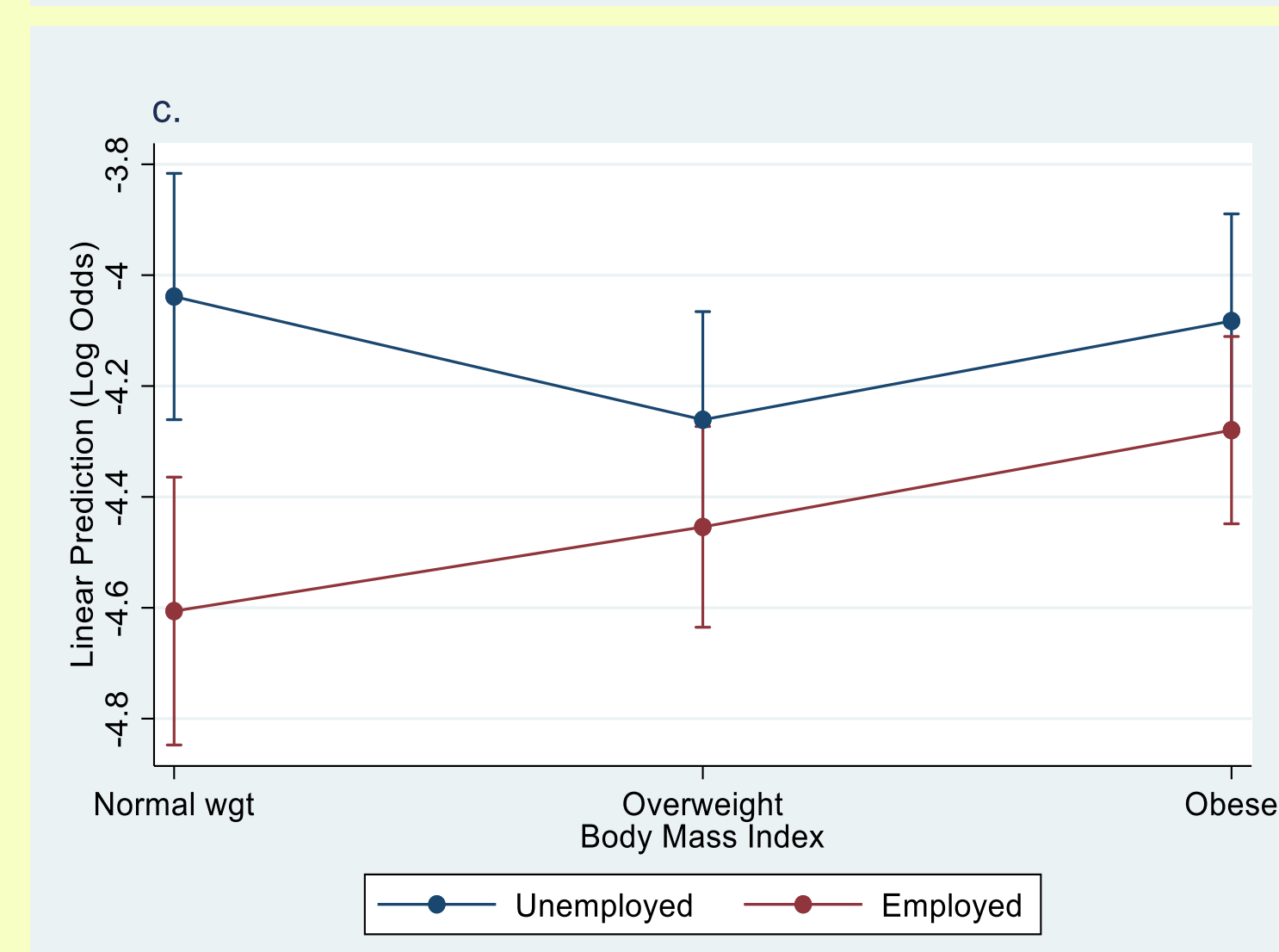
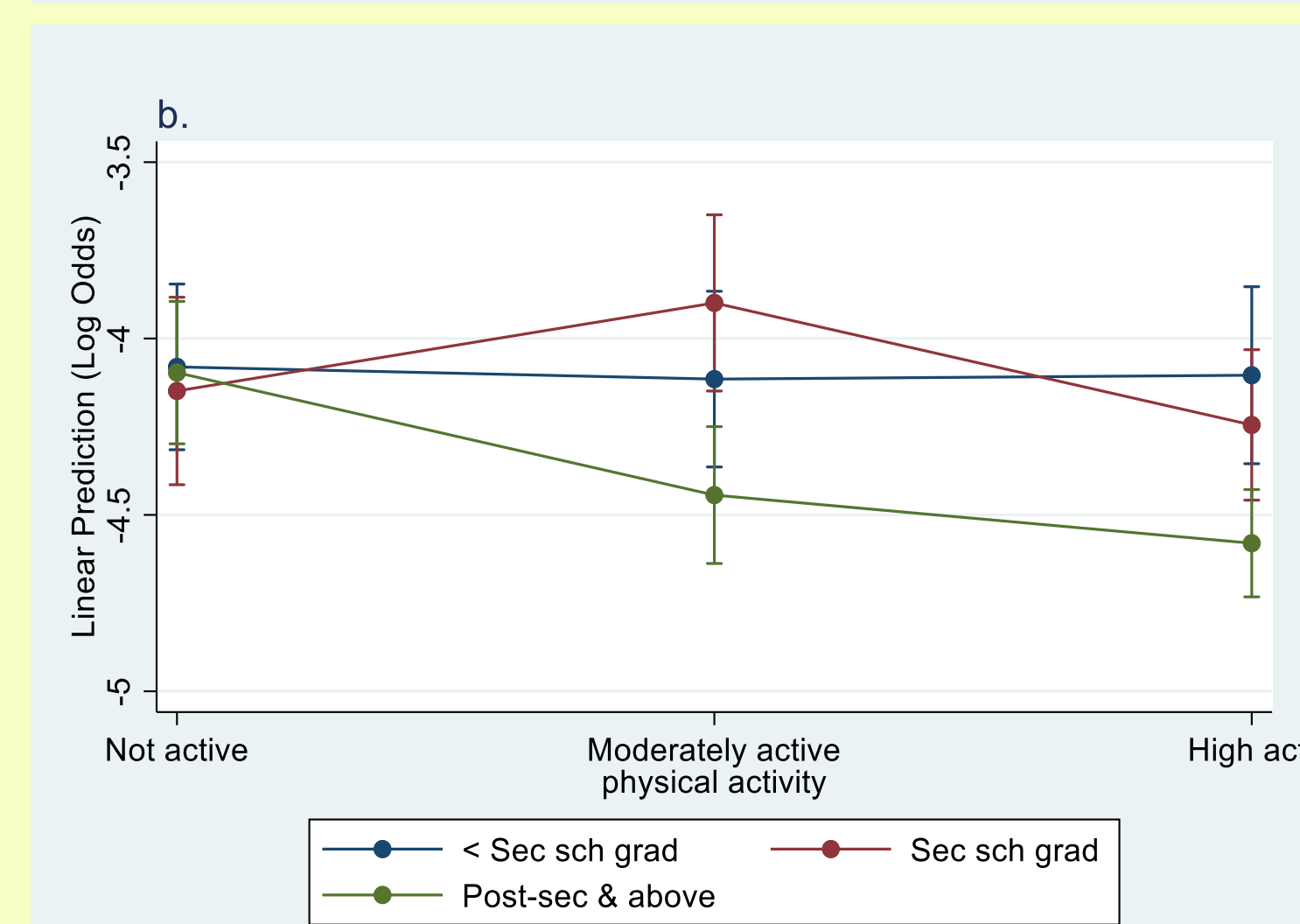
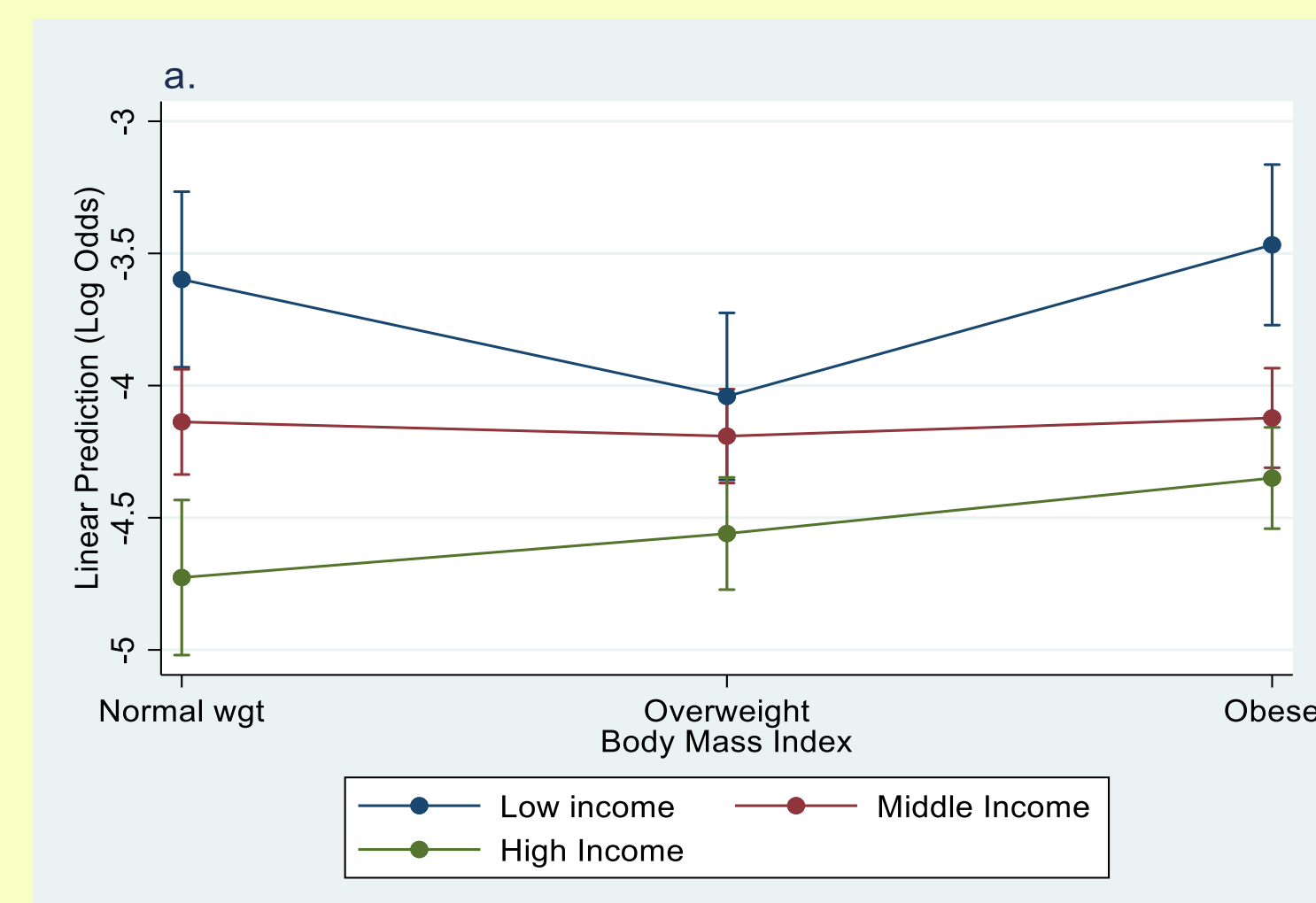
Adjusted Odds Ratios and 95% Confidence Intervals of COPD Prevalence with Associated factors among Adult Canadians Aged 35 Years and Over.

Predictors	OR	[95% CI]
Age group (35-49)yrs	1	
(50-59)yrs	1.88**	[1.53, 2.31]
(60-69)yrs	2.82**	[2.30, 3.45]
(70+)yrs	3.66**	[2.86, 4.69]
Sex (Female)	1	
Male	1.07	[0.94, 1.21]
Race (White)	1	
Non-white	0.46**	[0.43, 0.61]
Aboriginal	1.43**	[1.10, 1.87]
Smoking status (non-smoker)	1	
ex-smoker	2.50**	[2.12, 2.94]
current smoker	4.79**	[4.01, 5.72]
2nd Hand smoke (Exposed)	1	
Unexposed	1.21**	[1.07, 1.39]
Physical act (Highly active)	1	
Not active	1.62**	[1.32, 1.99]
Moderately active	1.15	[0.93, 1.42]
BMI (Normal weight)	1	
Overweight	0.89	[0.63, 1.27]
Obese	1.10**	[0.77, 1.57]
heart disease	2.38**	[2.00, 2.85]
Asthma	8.97**	[7.84, 10.26]
Arthritis	1.80**	[1.59, 2.04]
Educ. Level (Post-sec and above)	1	
< Sec sch grad	1.61**	[1.25, 2.07]
Sec sch grad	1.40**	[1.12, 1.74]
Employment (Employed)	1	
Unemployed	1.76**	[1.38, 2.26]
Household Income (High)	1	
Low income	3.14**	[2.18, 4.52]
Middle Income	2.150**	[1.46, 2.64]
Household income ×BMI		
Low income×overweight	0.55*	[0.34, 0.89]
Low income×Obese	0.79	[0.50, 1.26]
Middle Income×overweight	0.82	[0.56, 1.19]
Middle Income×obese	0.72	[0.49, 1.04]
Education×Physical act	1	
< Sec sch grad×not active	0.63*	[0.45, 0.89]
< Sec sch grad×mod active	0.86	[0.60, 1.25]
Sec Sch grad×not active	0.69*	[0.49, 0.96]
Sec Sch grad×moderately active	1.23	[0.86, 1.77]
Employment×BMI	1	
Unemployed×overweight	0.69*	[0.50, 0.94]
Unemployed×Obese	0.69*	[0.50, 0.95]

* p < 0.05 ** p < 0.01

RESULTS cont...

Predictive margins for the significant interaction between (a) Household income and BMI, (b) Education and Physical activity, and (c) Employment and BMI



CONCLUSION

- The risk factors of COPD prevalence identified in this study include:
 - Smoking status
 - Presence of heart disease
 - Comorbidities (asthma and arthritis)
- The effect of BMI and physical activity on COPD prevalence are influenced by the socioeconomic status of the individual.
- This has public health implications that population-based COPD prevention strategies should be tailored towards different SES groups and be supplemented with public health programs that promote good-health behaviours and discourage health damaging lifestyles such as smoking.
- Nevertheless, a longitudinal study accounting for changes in health and socioeconomic status over the lifespan is required to elucidate the nature of association.

REFERENCES

- O'Donnell, E. D. *et al.* Canadian Thoracic Society Recommendations for Management of Chronic Obstructive Pulmonary Disease-2008 Update-highlights for Primary Care. *Can Respir J* 15, 1A-8A (2008).
- Herrera, A. C. *et al.* COPD Underdiagnosis and Misdiagnosis in a High-Risk Primary Care Population in Four Latin American Countries. A Key to Enhance Disease Diagnosis: The PUMA Study. *PLoS One* 11, e0152266 (2016).
- World Health Organization. The top 10 Causes of Death. (2020). Available at: <https://www.who.int/news-room/fact-sheets/detail/the-top-10-causes-of-death>. (Accessed: 17th February 2021)
- Statistics Canada. Table 13-10-0394-01 Leading Causes of Death, Total Population, by Age Group. Available at: <https://www150.statcan.gc.ca/t1/tb11/en/tv.action?pid=1310039401>. (Accessed: 8th May 2021)
- Y. B., J. M., R. M., S. E. & NM, K. S. Prevalence and Associated Factors of COPD among Aboriginal Peoples in Canada: A Cross-sectional Study. *Int. J. Chron. Obstruct. Pulmon. Dis.* 12, 1915-1922 (2017).
- Van Remoortel, H. *et al.* Risk Factors and Comorbidities in the Preclinical Stages of Chronic Obstructive Pulmonary Disease. *Am. J. Respir. Crit. Care Med.* 189, 30-38 (2014).
- Ospina, M. B. *et al.* Incidence and Prevalence of Chronic Obstructive Pulmonary Disease among Aboriginal Peoples in Alberta, Canada. *PLoS One* 10, e0123204 (2015).
- Chen, W., Thomas, J., Sadatsafavi, M. & FitzGerald, J. M. Risk of Cardiovascular Comorbidity in Patients with Chronic Obstructive Pulmonary Disease: A Systematic Review and Meta-Analysis. *Lancet Respir. Med.* 3, 631-639 (2015).
- Postma, D. S., Bush, A. & Van Den Berge, M. Risk factors and early Origins of Chronic Obstructive Pulmonary Disease. *Lancet* 385, 899-909 (2015).
- Vozoris, N. T. & O'Donnell, D. E. Prevalence, Risk Factors, Activity Limitation and Health Care Utilization of an Obese Population-Based Sample with Chronic Obstructive Pulmonary Disease. *Can. Respir. J.* 19, e18-e24 (2012).
- Gergianaki, I. & Tsiligianni, I. Chronic Obstructive Pulmonary Disease and Rheumatic Diseases: A Systematic Review on a Neglected Comorbidity. *J. Comorbidity* 9, 1-10 (2019).
- Levin, K. A., Anderson, D. & Crighton, E. Prevalence of COPD by age, sex, socioeconomic position and smoking status; a cross-sectional study. *Health Educ.* 120, 275-288 (2020).
- Commission on Social Determinants of Health. *Closing the Gap in a Generation: Health Equity Through Action on the Social Determinants of Health.* (2008).