

Results There was a highly significant positive association between FEV1 and cumulative exposure after (but not before) the age of 25 years throughout the modelling ranges.

Conclusions We attribute this counter-intuitive association to selection bias through healthy worker and survivor effects. It provides a rare quantitative illustration of these phenomena, such that the FEV1 was on average 6 ml higher for every year of underground work after age 25. This is of comparable magnitude to the adverse effect of smoking.

209

HEALTHY WORKER AND SURVIVAL BIAS IN COAL MINERS SEEKING COMPENSATION FOR COPD

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Objectives The introduction of state compensation for COPD in UK coal miners in 1993 provided an opportunity to study the relative importance of dust exposure and smoking among a large population of sequential applicants without complicated pneumoconiosis (n=3064). The expected relation of FEV1 to height and age was readily demonstrated, as was an adverse effect of smoking. Young age at mining onset appeared to exert an adverse effect, but there was an unexpected highly significant positive association between FEV1 and years of underground work. This led us to revisit the dataset and estimate cumulative exposure more precisely.

Methods We used a model which took account of (a) the proportion of work at the coal face compared with less dusty work and (b) secular trends within the coal mining industry from 1914 to 1993 likely to have influenced dust levels more generally. We modelled the possible differences over wide ranges, and we separated cumulative exposure before age 25 (while function is still maturing and lungs may be more vulnerable) from that thereafter.