



# Socioeconomic disadvantage and lung health: accumulating evidence to support health policy

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**Understanding the associations between socioeconomic position and lung health provides the scaffold of evidence from which to develop better policies and interventions to reduce the disparities in social determinants, exposures and ultimately outcomes** <https://bit.ly/390kbJx>

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It is becoming increasingly clear that the social determinants of health are associated with lung health [1, 2]. The lungs are extremely sensitive to the lived experience of individuals, particularly to environmental influences, including pollution, poverty, and occupational and smoking exposures. Understanding the factors that are associated with a reduction in lung function may provide novel insights into the impact of social determinants on overall health. Social determinants of health are closely related to socioeconomic position and systemic inequalities, both within and between countries, which have further been exacerbated by the coronavirus disease 2019 pandemic [3]. Although associations between socioeconomic disparities and lung health have been reported for many years [2, 4–7], the impact has been contextualised by the pandemic and resulted in a call for more research and evidence-based policies [3, 8]. Therefore, it is very timely that ROCHA *et al.* [9] report on the association of socioeconomic disadvantage and lung function in a large cohort of European adults. In their study of more than 70 000 people followed in six cohort studies, they demonstrate how social circumstances during childhood and early adulthood, independent of smoking, result in reduced lung function throughout adulthood [10]. This study further supports the idea that risk factors for chronic lung disease originate in childhood [11], and that policies aimed at reducing inequalities during childhood could have positive effects across the life course.

Quantifying the association between social determinants and health outcomes is not straightforward. Importantly, social determinants of health are complex multidimensional exposures that lie on the causal pathway and accumulate over the life course. The use of classic epidemiological tools to understand these complex exposures may actually result in biased estimates of the associations [12]. Socioeconomic disadvantage, measured by income and/or education, provides a quantifiable measure of the social circumstances during specific periods across the life course. However, the social determinants of health encompass more than just education and occupation, and include systemic biases and inequities which are challenging to measure. Further social circumstances are also closely related to known risk factors for poor lung health, including environmental exposures (*e.g.* pollution, occupational hazards) and personal behaviours (*e.g.* smoking, sedentary lifestyle). This makes it challenging to identify the precise exposure or risk factor that would be amendable to policy or intervention and result in improved outcomes.

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In the study by ROCHA *et al.* [9], the research team harmonised six European cohorts which were available from the LifePath consortium. The collation of these cohorts provided a life course perspective of adults from the ages of 18–93 years of age, exemplifying the power and utility of epidemiological data to quantify the effects of social circumstances on lung health. The study also demonstrates the challenges in working with data to make inferences across the life course. Although the harmonised data provides a life course perspective of lung health across adulthood, the data represent cross-sectional measures of lung function in 70 000 individuals which may not represent individual trajectories or capture temporal cohort effects. Further investigations into the life course trajectories and the cumulative effects of exposures may elucidate the critical windows for intervention, or risk factors with the greatest attributed risk. The older individuals within the study also represent healthy survivors, who are more likely to have lived in advantageous social circumstances. Indeed, the magnitude of the association between socioeconomic position and lung health was attenuated at older ages. The harmonised study population also highlights the systemic under-representation of socially disadvantaged research participants, which is not unique to these six European cohorts. Of the original study population of 96 600 participants, nearly 30% were excluded. The excluded participants were more likely to have lower educational levels and lower occupational position. Even in this very large and carefully conducted study, the results likely underestimate the effects of social disadvantage on lung health.

The study by ROCHA *et al.* [9] presents the years of healthy lung health lost due to lower socioeconomic position. The concept of lung age is very interesting and an intuitive way to demonstrate the effects of an exposure on lung health. Representing the association as years of healthy lung function lost also provides a powerful public health message. However, this approach assumes that there is a single ideal measure of lung function at each age. The range of values observed in healthy individuals of the same height, age and sex is quite wide, and the average effect very much depends on the population that is represented in the comparator group. The wider variability may also mask some of the association. Furthermore, the study population assembled from the six European cohorts does not represent the longitudinal trajectories within an individual, making it challenging to interpret the findings.

Finally, the study by ROCHA *et al.* [9] highlights the complexities in analysing life course data and appropriately considering confounders, mediators and effect modifiers. The primary analysis was stratified by smoking status, as smoking status was considered a mediator in the relationship between socioeconomic position and lung function. In reality, the effects of exposures along the causal pathway are likely cumulative, and socioeconomic position and, more broadly social determinants, have both direct and indirect effects on health outcomes. Advances in epidemiological methods, and how we can consider the causal framework in social epidemiology are needed to better understand these important associations [13].

Overall, there is an urgent need for studies like that conducted by ROCHA *et al.* [9] to provide the scaffold of evidence from which to develop better policies and interventions to reduce the disparities in social determinants, exposures and, ultimately, outcomes. There is accumulating evidence that social disadvantage impacts lung health, and that the effects persist across the life course. Early opportunities to reduce harmful exposures during childhood have the potential to change lung health trajectories across the life course and minimise morbidity and mortality in adulthood. The study by ROCHA *et al.* [9] provides timely and important evidence to support ongoing efforts to reduce social disparities in health outcomes.

Conflict of interest: S. Stanojevic has nothing to disclose.

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