



Life course influences and cancer risk

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Cancer is one of the leading causes of death worldwide and plays a major role regarding social inequalities in mortality. Social inequalities in the burden of cancer have been reported both between and within countries and show that people with a more disadvantaged socioeconomic position (SEP) are at an increased risk of cancer mortality relative to their more advantaged counterparts. These inequalities are partly the result of socially stratified access to care once cancer has been diagnosed, where access to care and management (screening, treatment and surveillance) impact cancer survival. However, they are also the long term consequence of socially stratified exposures to cancer risk factors. These include material exposures (including inert ones such as asbestos, or living ones such as Human Papilloma viruses) and behavioural mechanisms (including tobacco consumption and fatty food intake).

However, these determinants are not sufficient to explain observed cancer inequalities, which remain poorly understood and complex. Recent work has suggested that the origins of adult cancer may have their roots in the early life environment, where social determinants are linked to cancer development along complex life course pathways (Kelly-Irving et al. 2013; Williams et al. 2016). As such, cancer may be a disease model particularly relevant to investigate how social factors become biologically embedded, via a life course approach. Life course theory and methods have been influential in epidemiology since the late 1990s (Bartley et al. 1997; Kuh and Ben-Shlomo 1997). As an integrative approach, it facilitates understanding the mechanisms behind the observation that

exposures or conditions experienced by people at one point during their lives are associated with health outcomes many decades later (Blane et al. 1996; Davey-Smith et al. 1998). This is especially important when seeking to understand the construction of social inequalities in health by identifying and disentangling the drivers and mechanisms (Blane 2001; Blane et al. 2013). The following four principles governing the shape and pattern of life courses (McGee et al. 1999) act as guiding threads throughout the complex work of life course research from theory through methodologies to the interpretation of findings (Giele and Elder 1998): context, historical time & place; timing; linked lives; and agency and opportunity.

However, such approach to studying cancer remains challenging (Williams et al. 2016; Kelly-Irving and Delpierre 2017). This call aims to partly close this gap. The two first articles, published by Orlewska et al. and Akinyemiju et al., respectively, give evidence of social inequalities of cancer incidence and mortality across countries. These papers underline the influence of several social determinants, particularly early social conditions, at both ecological and individual levels. Akinyemiju et al. show that disadvantaged early life SEP may be associated with reduced risk of breast cancer incidence and increased risk of breast cancer mortality in adulthood. Findings by Van der Linden et al. suggest that advantaged childhood socioeconomic conditions are associated with an increased risk in overall cancer onset in older age, even after adjustment for adulthood socioeconomic conditions, with results varying by cancer sites and by sex. These results highlight the complexity of the relationship between early SEP and cancer by cancer type, country and incidence versus survival. The paper published by Chen et al. elucidates this complexity, notably by including some of the biological mechanisms by which the social environment may act upon cancer development. Along the same lines of enquiry, Demakakos et al. explore the influence of chronic stress as a pathway through which early SEP influences cancer risk, showing that the experience of poorer quality parenting in childhood is associated with cancer development in a national sample of community-dwelling men and

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women at 55 years of age and older. The role of stress is also addressed the paper by Menvielle et al. Here, the authors observe that occupational prestige trajectory is strongly associated with lung and head/neck cancer risk in men and women, even after adjusting for tobacco, alcohol consumption and occupational exposures.

We hope that this special issue provides insights into how SEP across the life course may have implications for cancer development, progression and survival. More generally, this issue allows us to gain an initial foothold in combining a life course approach to studying cancer epidemiology. Developing research in their area is needed to understand the causes of cancer through the identification of the multiple pathways through which the social environment may act upon cancer risk and survival over the life course.

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