Research Findings:6
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Life course influences on health in early old age

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- Our understanding of health inequalities is most advanced in relation to childhood and the years of adult working life. Yet it is amongst the post-retirement population that we see the highest levels of morbidity, mortality and health service utilisation.
- An increasing body of research suggests that health in later life is the outcome of experiences and exposures across the life course. Studies have shown that childhood circumstances have long-term implications for both adult health and socioeconomic circumstances.
- In our study, archive data from a 1937-39 nationwide survey of diet and health among children, and retrospective life course interview data with survey survivors, were used to examine the relationship between accumulation of disadvantage through the life course and health outcomes in early old age.
- The study found evidence to support the theory that material and environmental disadvantage accumulates over the life course and is linked to social class. Disadvantage in childhood, in terms of illness and social position, is associated with higher levels of accumulated exposure to hazards in the living and working environments by early old age. Socioeconomic and health disadvantages after retirement from paid employment are associated with the level of disadvantage which has previously accumulated across life.
- The life course appears to influence health in early old age in a number of ways. For some health outcomes, the influences may accumulate across the whole life course, involving factors in childhood, adulthood and early old age. For others, experiences early in life may be important, or the relationship may be conditional, where factors from different stages in the life course have to occur sequentially before the later life effect is produced.
- Health inequalities in adulthood may partly reflect a lifetime's differential accumulation of exposure to health-damaging and health-promoting environments. Recent government policy has emphasised the importance of improving conditions in childhood in reducing health inequalities in the long-term. In addition to this, however, policy interventions must improve living and working conditions for people at all stages of the life course.

Background

There is an increasing body of research which suggests that health in adult life is the outcome of experiences and exposures across the life course. The 'life course perspective' holds that social organisation structures life chances so that advantages and disadvantages cluster cross-sectionally and accumulate longitudinally. As a consequence of this, observed social class differences in health in early old age can be seen as the biological correlate of socially structured, differential exposure to health hazards.

Research has shown that childhood circumstances have long-term implications for both adult health and socioeconomic circumstances. Just as childhood conditions can be seen to influence adult health, so living and working conditions in adult life can be seen to influence health after retirement. Amongst the post-retirement population, most of the prevalent chronic illnesses have developed slowly over several decades. Whilst cross-sectional studies can explain some of the variations in the observed distribution of these illnesses, a method of examining the whole lifespan is needed to investigate the ways in which pre-retirement living and working conditions affect health after retirement.

Birth cohort studies, where subjects are tracked from birth throughout life, are the most powerful research method for examining life course influences on health. However, the earliest birth cohort study members in Britain were born in 1946 and are currently in their early fifties, an age when most of the common illnesses of old age are not yet manifest. There remains, therefore, a need for collecting retrospective life course data.

Between 1937 and 1939, the Rowett Research Institute, headed by Sir John Boyd Orr, conducted a nationwide survey of diet and health. Families from 16 centres in Scotland and England took part in a detailed inquiry into their diet and health (Gunnell et al. 1996). This survey is one of the most valuable sources of information on diet and health in pre-war Britain and provided an excellent opportunity to investigate the precursors of health in early old age by supplementing the archive data on childhood diet, health and living conditions with retrospective data on life since childhood.

Data and methods

Our sample comprised children who were medically examined and aged between 5-14 years at the time of the original survey. In total, 294 men and women aged between 63 and 78 years old were interviewed using a modified lifegrid (Blane 1996; Berney and Blane 1997; Holland et al, 1998). Lifegrid interviews use a series of time-lines to collect landmark events from different areas of a subject's life and use them as aids to recall additional retrospective life course information.

Interviewees were asked about their living and working conditions since childhood. Using this information, we were able to calculate the number of years they had been exposed to given hazards, namely, air pollution, residential damp, occupational fumes and dusts, physically arduous labour, lack of job autonomy, inadequate nutrition in childhood and adulthood, and cigarette smoking. These hazards were selected on the basis that exposure to them is socially patterned and because they offer a biologically plausible link between exposure and morbidity/mortality. For example, air pollution, damp, fumes and dust and cigarette smoking are all contributory factors for respiratory disease, and lack of job autonomy has been associated with a increased risk of coronary heart disease. The number of years' exposure to each hazard were aggregated to create a combined lifetime hazard exposure score, providing a measure of the combined 'insults' with which the body's regenerative mechanism has to cope.

Subjects were also asked about their current socioeconomic circumstances and health. Finally the subject's height, weight, blood pressure and lung function were measured. Retrospective interview data were supplemented by archive data from the original survey. Measured height was compared with self-reported height and height in childhood (Gunnell et al, 2000). Childhood height and the presence of signs of chronic disease, recorded in the original survey, were chosen as measures of childhood health.

Results

Childhood conditions and subsequent hazard exposure

It is well established that poor health early in life has long term impacts on adult health. Chronic illness and slow growth in childhood can both be described as forms of early disadvantage and have been linked to both poor health and socioeconomic disadvantage in later life. We found that males and females who were short for their age in childhood accumulated greater hazard exposure up to early old age than their taller peers (Holland et al. 2000). The association between childhood height and mean lifetime exposure to the combined hazards is graded: as childhood height decreases, lifetime exposure increases.

The association between childhood symptom status and lifetime hazard exposure was less clear. Males who showed signs of chronic disease at the clinical examination in childhood accumulated greater hazard exposure than their symptom-free peers. However, the relationship for females was reversed, with those who were symptom-free accumulating greater hazard exposure.

Figure 1 shows that the pattern of hazard exposure for men from manual backgrounds is as we might expect, with the shortest and the symptomatic showing higher levels of exposure than the tallest and the symptom-free. The tallest children from both manual and non-manual backgrounds accumulated less subsequent exposure than their shorter peers. However, the pattern for symptom status in childhood is more problematic, with symptomatic women and non-manual men accumulating less lifetime exposure than their symptom-free peers.

One possible explanation for this is that the presence of these symptoms in childhood, more so than short stature, is likely to be recognized as a sign of physical frailty. It may well be the case that, where possible, parents set such children on a 'protective' life trajectory, avoiding further rapid hazard accumulation by, for example, entering non-manual occupations (Blane et al. 1999). Those who are not afforded such protection may experience a greater accumulation of hazard exposure. Those least likely to receive such protection, for whom alternatives to paid (or, at the very least, less hazardous) employment were most restricted, were men from manual class homes.

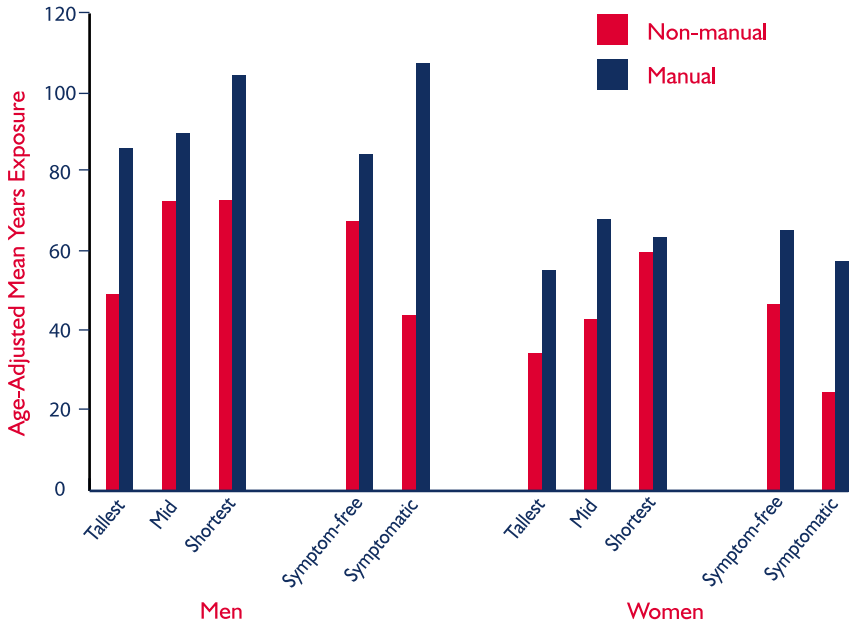

Figure 1: Lifetime Exposure to Combined Hazards: Childhood Height and Symptoms by Father's Social Class

Health inequalities in adulthood may partly reflect a lifetime's differential accumulation of exposure to health-damaging and health-promoting environments. These results show childhood disadvantage is associated with the accumulation of further disadvantage in terms of exposure to health damaging hazards throughout the life course. This supports other evidence that individuals experiencing disadvantage as children are more likely to accumulate further disadvantages. The social patterning of this hazard exposure is further illustrated when we look at the current socioeconomic status of our subjects.

Current socioeconomic status and previous lifetime hazard exposure

We found a clear trend of increasing hazard exposure with decreasing social class (Figure 2). The main anomaly to the trend is the lower levels of hazard exposure for men in social class IIINM.

The most likely explanation for this is the social mobility of men who had spent the bulk of their working lives in social class IIIM, with its relatively high risk of hazard exposure, who then established their own businesses later in life and moved into social class II. In contrast to such men, it would be expected that subjects who remained in social class IINM for the bulk of their working life would amass less hazard exposure. When the subjects were classified as being either manual or non-manual class, highly significant differences, for both men and women, were found between the two groups (Berney et al, 2000). In addition to information on occupation, data on a range of additional socioeconomic indicators were also collected, including housing tenure, car ownership, possession of a works or private pension, and receipt of state benefits. On each measure, those who were disadvantaged after retirement had previously accumulated longer lengths of exposure to the hazards than those who were advantaged after retirement.

Social class and health outcomes in later life

When we examined the current health of our subjects, we found that the social class differences in the various measures of self-reported health (limiting long-standing illness, freedom from serious disease, regular prescribed medication) were mostly confined to men. Associations were found between the length of some individual hazard exposures during adulthood and self-reported health in early old age. The number of years of exposure to low levels of job-autonomy, for example, was related to both longstanding illness and lack of freedom from serious disease.

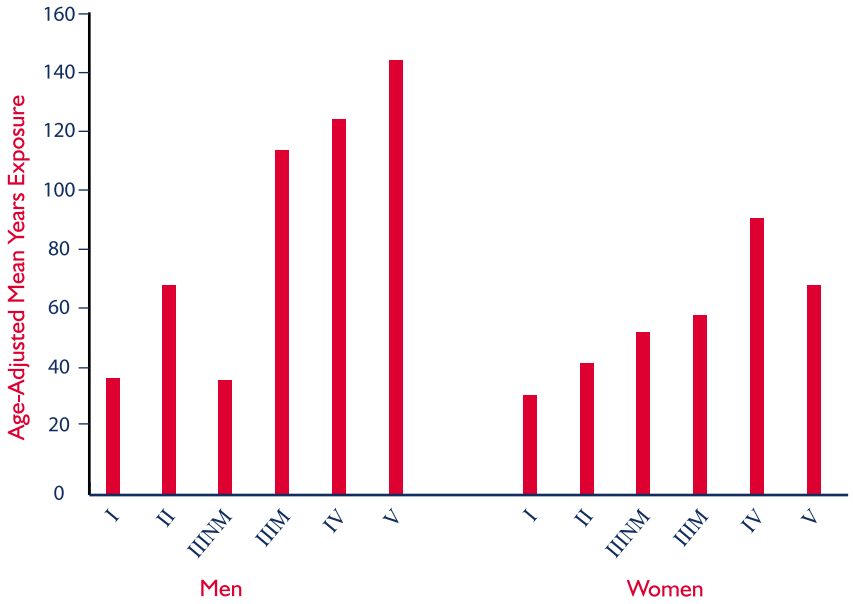

Figure 2: Lifetime Exposure to Combined Hazards by Subject's Own Current Social Class

Looking at each of the individual physiological measures taken at the end of the interviews, it was found that lung function in women was related to factors across the whole life course. For women, their current social class, combined lifetime hazard exposure (independent of cigarette smoking status), years of cigarette smoking, and childhood socioeconomic position were all related to their measured lung function. Among men, however, lung function was found to be related only to their current social class and to combined lifetime hazard exposure (independent of cigarette smoking status). Both manual class men and manual class women had poorer lung function compared with their non-manual counterparts.

Blood pressure in early old age was found to be unrelated to current social class. Whilst non-manual men and women did have lower systolic blood pressure than their manual counterparts, the difference was not statistically significant. However, it was found that diastolic blood pressure was related to a combination of (1) being of shorter than average height during childhood and (2) having a more obese than average Body Mass Index in early old age. Diastolic blood pressure was not related to either of these factors on their own; the life course effect appeared only when these childhood and adult factors were placed in a sequential or conditional relationship.

Conclusions and policy implications

The study found evidence to support the theory that material and environmental disadvantage accumulates over the life course and is linked to social class. Disadvantage in childhood, in terms of illness and social position, is associated with higher levels of subsequent accumulation of disadvantage indicated by hazard exposure. Disadvantage after retirement from paid employment is associated with the level of disadvantage which has previously accumulated across life. The determinants of health inequalities are linked to the social structure and to the way that structure influences the lifestyle and quality of life of individuals. Of key importance to this process is the effect these influences exert over time.

It appears that there are at least three ways in which the life course influences health in early old age. In some cases, such as lung function, the influences may accumulate across the whole life course, involving factors in childhood, adulthood and early old age. Alternatively, the later life relationship may have been determined largely, as in the case of adult height, at a much earlier stage of life. Finally, as in the case of blood pressure, the relationship may be conditional in that factors from different stages in the life course have to occur sequentially before the later life effect is produced.

Both of the major government investigations into health inequalities in the U.K., the Black Report (DHSS 1980) and the Acheson Report (DH 1998), emphasised in their policy proposals the importance of improving the circumstances of children in reducing health inequalities in the long-term. Deprivation and ill health in childhood negatively impact on adult health. We found that disadvantage and ill health in childhood predicted disadvantage and ill health in adulthood.

However, in addition to this, we would argue that no stage of the life course is particularly privileged. Those of our subjects who were currently in the most disadvantaged circumstances in retirement were more likely to be in poor health and more likely to have had the highest levels of hazard exposure. Such a combination of events does not occur randomly: it is socially structured. Interventions which improve living and working conditions, such as reducing exposure to the hazards we have looked at, will help no matter what stage of the life course they target. In the same way as disadvantage has a knock-on effect in terms of future ill-health and further disadvantage, assistance, be it in terms of better housing, improved working conditions, cleaner air or better nutrition, will have knock-on benefits.

The Acheson Report has emphasized that intersectorality is the key to tackling health inequalities. At home, at school, at work - there are hazards to health and signs that can be identified and acted upon. Inequalities in health in early old age may be greatly reduced by an approach that seeks to address these life course influences.

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