RESEARCH REPORT

Accumulation of adverse socioeconomic position over the entire life course and the risk of myocardial infarction among men and women: results from the Stockholm Heart Epidemiology Program (SHEEP)

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Background: Accumulation of adverse socioeconomic position over the life course is assumed to increase the risk of myocardial infarction.
Objective: To analyse in detail whether the accumulation of adverse socioeconomic position over the life course increases the risk of myocardial infarction, using yearly information on individual socioeconomic position from birth to disease onset.
Design: Case–control study of risk factors for incident myocardial infarction (Stockholm Heart Epidemiology Program).
Setting: All Swedish citizens born during 1922–49 and living in Stockholm County during 1992–4.
Participants: 550 female and 1204 male patients and 777 female and 1538 male controls. Every year in manual work was added to calculate a proportion of the whole life course spent in adverse socioeconomic position.
Results: With increasing proportion of life spent in adverse socioeconomic position, we found an increasing risk of myocardial infarction. The relative risk of myocardial infarction was 2.36 (95% confidence interval (CI) = 1.79 to 3.11) for men and 2.54 (95% CI = 1.70 to 3.78) for women who, over the entire life course, had always been in adverse socioeconomic position compared with those who had never been in adversity. We also found a strong increase in risk from being in adversity for only a few years, indicating important selection processes.
Conclusions: Accumulated experience of adverse socioeconomic position over the entire life course increases the risk of myocardial infarction for men and women, but it is not a pure accumulation process as ''how'' and ''when'' the accumulation occurs also seems to have a role. The accumulation effect is partly mediated by the acquisition of health-damaging experiences.

Accumulation of risk has been introduced as a key concept in the life-course approach to the study of chronic disease aetiology.[1] It suggests that exposures or insults throughout the life course gradually accumulate through episodes of illness, adverse environmental conditions and behaviours, increasing the risk of chronic disease and mortality.[2] As a model, it offers a broader framework for discussing the influence of risk factors in early life.[1] Another feature of interest is that accumulated exposure provides a possible explanation that is alternative to hierarchical stress mechanisms for the social gradient in mortality risk often found to be preserved across a large number of hierarchically ordered social positions.[3–7] Empirical testing of the accumulation hypothesis requires a strict definition, which so far has been implicit and mostly understood as a dose–response relationship. It is still a matter of discussion whether the hypothesis proposes accumulation of exposures or accumulation of risk, and whether the result is an additive effect or a combined action resulting in synergistic effects. Another important problem is that the theoretically distinct concepts of accumulation and critical periods cannot be measured independently, making it difficult to empirically disentangle their effects.[8]

Studying the health effects as the number, duration or severity of social risk factors increase, or as various risk factors cluster, has been a challenge to social epidemiology because exposure is related to social positions or social trajectories. Studies have shown an increased risk of disease from accumulated exposure to adverse socioeconomic positions,[9–20] accumulation or clustering of risk factors in subjects exposed to socioeconomic adversity[20 21] and an increase in risk of disease from accumulated exposure to specific risk factors related to disadvantage in childhood.[22] The measure of accumulated adverse socioeconomic positions is in most studies rather crude and is based on a combination of father's socioeconomic position (childhood), highest educational attainment or first occupation (young adulthood) and current occupation-based socioeconomic position (adulthood).[9 11–15 23–26] Other studies have used a combined accumulation score of exposures both to specific risk factors and to socioeconomic adversity.[18 26]

In this study, we used the year-by-year information on occupation-based socioeconomic position from birth to disease onset, available from the Stockholm Heart Epidemiology Program (SHEEP). Our aim was to analyse the effect of cumulative life-course exposure to adverse socioeconomic positions on the risk of incident myocardial infarction, and further to explore whether it is primarily a process of strict accumulation or whether it matters how and when the accumulation occurs. Another aim was to analyse whether experience of accumulated adverse socioeconomic positions is associated with exposure to risk factors of

Abbreviation: SHEEP, Stockholm Heart Epidemiology Program

myocardial infarction and to what extent these potentially intermediary mechanisms explain the accumulation effect.

METHODS

Study population

The SHEEP study is a population-based case–control study of risk factors for incident myocardial infarction and has been described in detail elsewhere.[27] The study base included all Swedish citizens aged 45–70 years, with no prior clinically diagnosed myocardial infarction event, living in Stockholm County during 1992–4. Patients were identified through a special organisation set up at the coronary and intensive care units of the hospitals in the catchment areas, and from hospital discharge records and death certificates. Patients were diagnosed according to standard criteria. One control per case was randomly selected at the time of case incidence from the study base after stratification for age, sex and hospital catchment area. More controls than patients were finally included, because sometimes the control was already included when the patient chose not to participate. In addition, if a control did not participate, another control was included, but sometimes they both participated.

In total, 2246 patients and 3206 controls were included. All study subjects received a postal questionnaire covering a large set of potential risk factors, and were invited to a physical examination and blood sampling. In the case of missing answers, a supplementary telephone interview was conducted. For fatal cases, a relative answered the questionnaire 6–12 months after the event. The questionnaire response rate among patients was 72% for women and 81% for men, and corresponding figures among controls were 70% and 75%. In the final study sample, 508 female and 1146 male patients and 752 female and 1516 male controls, with information on socioeconomic position throughout the whole life course, were included.

Accumulation of adverse socioeconomic position

The questionnaire included detailed information on occupations, work titles and work tasks throughout the entire working life. Most participants also reported their parents' main occupations during their first 16 years of life, and we used the information of the father's occupation (if available) to define childhood socioeconomic position. For 56 participants, father's occupation was taken from the birth certificates. Socioeconomic position was coded on the basis of occupation, using the information on work title and work tasks, according to the classification of Statistics Sweden,[28] which is similar to the classification of Erikson–Goldthorpe.[29]

For every subject we then calculated the number of years spent in adverse socioeconomic positions from birth to inclusion, defined as unskilled or skilled manual work. Each subject's number of years in adverse socioeconomic positions was divided by the age at inclusion, giving the proportion of the life spent in adverse socioeconomic positions. Subjects were categorised into one group of never-adverse socioeconomic position and one group with always-adverse, with three groups in between according to increasing proportion of life course in adverse socioeconomic position.

Potential mediators and confounders

National registers provided information on family income, measured as the individual's disposable post-tax income in the year before inclusion after transfer of social benefits, taking into account where applicable the income of both spouses and the number of consumption units in the household. Family income was categorised into thirds, with the same cut-off points for men and women. The highest self-reported educational level was defined as college or higher education, including university, the middle group as an educational level equivalent to high school or other intermediate-level education, and the lowest group as not more than the compulsory level of education. Cohabiting status was defined as either cohabiting or not at inclusion. Subjects who were unemployed, on sick leave, early retired or pensioners at inclusion were classified as outside the working market. Small for gestational age was defined as the smallest 25% based on information from birth records. Familiarity was defined as at least one first relative with previous coronary heart disease before the age of 65 years. Social network was calculated as a summary index of questionnaire data on network structure, social support and social activities analogous to earlier studies.[30] Experience of self-perceived lack of control over excessive demands in life was measured by a short version of the perceived stress scale from Cohen *et al*.[31] Job strain was defined as combined exposure to self-reported lack of control and high psychological demands at work, with the worst quartiles for each entity as exposed.

Alcohol consumption from the year before inclusion was divided into four categories: abstainers, 0.1 to <5 g of alcohol/day (reference category), 5–70 g/day (men), and >70 g/day (men); 5–30 g/day (women) and >30 g/day (women).[32] Hypertension was defined as (1) being treated for hypertension; (2) a history of regular drug treatment for hypertension during the past 5 years (or a part of that time); or (3) a systolic blood pressure $\geqslant$170 mm Hg or a diastolic blood pressure $\geqslant$95 mm Hg at examination.[27] The World Health Organization criterion for obesity (body mass index $\geqslant$30 kg/m^2) was applied. Subjects were classified as having diabetes if information from the questionnaire stated diabetes with insulin, drug treatment or diet control at the time of inclusion. Subjects who reported inactive leisure time, including only occasional walks, during the past 5–10 years were categorised as ''exposed'' to physical inactivity.[27] Subjects who had never smoked regularly for at least 1 year were considered to be non-smokers. Subjects who smoked daily when included or had stopped smoking within the last year were classified as current smokers. Subjects who had stopped smoking for >1 year before inclusion were classified as ex smokers.[27]

Eight social trajectories, reflecting social mobility and life-course patterns of exposure to socioeconomic adversity, were constructed from dichotomised measures of adverse socioeconomic position or not at three stages in life: in childhood, at age 35 years and at inclusion.

Statistical analyses

We used unconditional logistic regression to calculate odds ratios as estimates of the relative risk (RR). For statistical analyses, SAS V.8.2 was used.

RESULTS

Approximately one third of both male and female controls were in the reference category (never adverse) and about 10% were in the most exposed group (always adverse). For several mediators and potential confounders, the never adverse group had the lowest prevalence, with increasing gradient to the most exposed in the always-adverse group (table 1). This was seen for lifestyle factors such as physical activity and smoking, but was less evident for body mass index and alcohol consumption. The gradient in the prevalence of low and medium education and low and medium family income also followed the proportion of life spent in adversity, with the most adverse having the lowest education and income. Owing to a higher age structure among women, more women than men were not cohabitating and were outside the labour market. The proportion of controls shifting between the two socioeconomic positions used in the analysis during their life

course varied from 573 (37.8%) among men and 278 (37.0%) among women who were stable in their childhood socioeconomic position to 59 (6.6%) among men and 36 (4.8%) among women controls who shifted from or to adversity ⩾4 times during their life course (data on the entire distribution not shown).

Table 2 shows the effects of being in an adverse socioeconomic position for increasing proportion of the life course, with a RR of 2.36 (95% confidence interval (CI) 1.79 to 3.11) for men in the always-adverse category and 2.54 (95% CI 1.70 to 3.78) for women in the same category. Adjustment for unhealthy behaviour decreased the accumulation effect for men in the always-adverse category to RR of 1.84 (95% CI 1.38 to 2.47). Adjusting for social factors reduced the higher risk for the most exposed groups. We saw the same pattern for women as for men, but due to smaller numbers the effect measures had wider CIs. Combining models of social factors or behavioural factors with trajectories of social mobility reduced the gradients in men to be more constant over all exposure groups. The RR was 1.55 (95% CI 0.91 to 2.63) for the most exposed in the combined behavioural and trajectories model (data not shown). For women, the model of trajectories alone explained a large part of the accumulation gradient. Information on familiarity of cardiovascular disease and small for gestational age was not available for 25% of the subjects. Models adjusting for familiarity of cardiovascular disease and for small for gestational age did not differ substantially from crude models with regard to the subjects with available information (data not shown).

The decreased risks of accumulation when social trajectories were controlled for suggest that it is important how and when the accumulation of adverse socioeconomic positions occurs. This was further indicated by the large increase in risk in the group with a maximum of only one third of their life spent in adverse positions. The early and strong effect of ever being in socioeconomic adversity was more distinct for men (RR = 1.55, 95% CI 1.23 to 1.96) than for women (RR = 1.29, 95% CI 0.92 to 1.79) in the crude analyses. Adjustment for the different models of mediators and confounders lowered this effect, especially in women (table 2). Further analyses showed that this sharply increased risk was present after only a few years in adverse socioeconomic positions (table 3). As these analyses were based on small numbers with wide CIs and fluctuating point estimates, we present data with 5-year cut-offs. In-depth analyses suggest that it takes a few years for the risk to increase for men.

DISCUSSION

This study shows an accumulated effect of the proportion of life spent in socioeconomic adversity on the risk of myocardial infarction in both men and women on the basis of yearly information on socioeconomic position. We also unexpectedly found an early and strong increase in risk of socioeconomic adversity among both men and women which, together with lowered increase in accumulated risk after adjustment for social trajectories, speaks against a pure accumulation effect of socioeconomic adversity on the risk of myocardial infarction.

Our results support earlier studies that have shown cumulative time in life spent in adverse socioeconomic position to be associated with increased risk of cardiovascular disease.[9–19 25 26] The accumulation effect seen in our study is partly explained by behavioural risk factors such as alcohol consumption, physical inactivity and smoking. In a recent paper showing cumulative effects on cardiovascular disease of 10 different measures of socioeconomic position and material standards in women, the authors could not fully explain the effect by adult risk factors.[18] However, we caution against too strong conclusions regarding the strength of these statistical explanations as the mediators (or confounders) are crudely measured and categorised, implying the possibility of residual effects. Others have pointed out that behavioural and biological risk factors measured at just one point in time does not accurately reflect their cumulative contribution to increase in risk of disease.[14] We grouped potential mediators and confounders in the adjusted analyses to reflect similar exposures in entity and in time. The behavioural and

Table 1 Distribution of risk factors (n, %) among male and female controls in five categories of increasing proportion of the life course spent in adverse socioeconomic position, Stockholm Heart Epidemiology Program 1992–4

% of life in adverse socioeconomic position	Men					Women				
	Never	0 to ⩽33	33 to <67	67 to ⩽100	Always	Never	0 to ⩽33	33 to <67	67 to ⩽100	Always
Total	418 (27.6)	349 (23.0)	405 (26.7)	189 (12.5)	155 (10.2)	205 (27.3)	198 (26.3)	167 (22.2)	109 (14.5)	73 (9.7)
BMI >30 m^2/kg	38 (9.1)	39 (11.2)	34 (8.4)	26 (13.8)	20 (12.9)	28 (13.7)	18 (9.1)	25 (15.0)	26 (23.8)	11 (15.3)
Physical inactivity	131 (31.4)	106 (30.7)	135 (33.4)	68 (36.2)	67 (43.5)	67 (32.7)	79 (40.1)	64 (38.6)	56 (51.4)	38 (54.3)
Alcohol abstainer	22 (5.3)	29 (8.3)	35 (8.7)	20 (10.6)	10 (10.3)	19 (9.3)	15 (7.6)	15 (9.0)	17 (15.6)	17 (23.6)
0.1–5 g/day	85 (20.3)	74 (21.3)	72 (17.8)	46 (24.3)	44 (28.4)	74 (36.1)	91 (46.0)	87 (52.4)	53 (48.6)	32 (44.4)
5–70 g/day	294 (70.3)	224 (64.4)	287 (71.0)	110 (58.2)	84 (54.2)					
70+ g/day	17 (4.1)	21 (6.0)	10 (6.0)	13 (6.9)	11 (7.1)					
5–30 g/day						104 (50.7)	82 (41.4)	62 (37.4)	38 (34.9)	22 (30.6)
30+ g/day						8 (3.9)	10 (5.0)	2 (1.2)	1 (0.9)	1 (1.4)
Current smoker	102 (24.4)	90 (25.8)	128 (31.6)	80 (42.3)	60 (38.7)	35 (17.1)	49 (24.8)	55 (32.99	27 (24.8)	25 (34.2)
Ex smoker	137 (32.8)	127 (36.4)	145 (35.8)	64 (33.9)	46 (29.7)	69 (33.7)	46 (23.2)	32 (19.2)	25 (22.9)	9 (12.3)
Hypertension	98 (23.4)	105 (30.1)	106 (26.2)	51 (27.0)	38 (24.5)	48 (23.4)	59 (29.8)	41(24.6)	32 (29.4)	23 (31.5)
Diabetes	161 (3.8)	25 (7.2)	21 (5.2)	10 (5.3)	15 (9.7)	7 (3.4)	5 (2.5)	4 (2.4)	7 (6.4)	0 (0)
Low life control	39 (9.3)	39 (11.2)	61 (15.1)	29 (15.3)	24 (15.5)	32(15.6)	46 (23.2)	42 (25.2)	26 (23.8)	11 (15.1)
Low social network	48 (11.5)	44 (12.6)	56 (13.8)	47 (24.9)	30 (19.4)	25 (12.2)	36 (18.2)	35 (21.0)	19 (17.4)	19 (26.0)
Job strain	7 (1.7)	11 (3.2)	9 (2.2)	14 (7.4)	12 (7.8)	9 (4.5)	17 (8.7)	23 (14.0)	13 (12.0)	13 (18.1)
Low education	22 (5.39	105 (30.1)	137 (33.8)	104 (55.0)	98 (63.2)	51 (24.9)	92 (46.5)	83 (50.0)	78 (71.6)	61 (83.6)
Medium education	51 (12.2)	99 (28.4)	125 (30.9)	70 (37.0)	48 (31.0)	29 (14.2)	30 (15.2)	36 (21.7)	15 (13.8)	12 (16.4)
Low family income	89 (21.3)	79 (22.6)	119 (29.4)	67 (35.4)	54 (34.8)	36 (17.6)	56 (28.3)	59 (35.3)	47 (43.1)	44 (60.3)
Medium family income	98 (23.49	112 (32.1)	128 (31.6)	77 (40.7)	73 (47.1)	76 (37.1)	81 (40.9)	72 (43.4)	41 (37.6)	21 (28.8)
Not cohabiting	64 (15.3)	56 (16.0)	63 (15.69	51 (27.0)	38 (24.3)	60 (29.4)	63 (31.8)	51 (30.7)	29 (26.8)	22 (30.1)
Outside working market	165 (39.5)	166 (47.6)	142 (35.1)	81 (42.9)	79 (51.0)	109 (53.2)	121 (61.1)	82 (49.4)	78 (71.6)	61 (83.6)

BMI, body mass index.

Table 2 Relative risk of myocardial infarction (with 95% confidence interval) and exposure to adverse socioeconomic position for an increasing proportion (%) of life in men and women aged 45–70 years, Stockholm Heart Epidemiology Program 1992–4

% of life in adverse socioeconomic position		Men					Women				
		Never	0 to ⩽33	33 to <67	67 to ⩽100	Always	Never	0 to ⩽33	33 to <67	67 to ⩽100	Always
Crude*	RR	1	1.55	1.65	1.82	2.36	1	1.29	1.49	1.52	2.54
	95% CI		1.23 to 1.96	1.32 to 2.06	1.39 to 2.39	1.79 to 3.11		0.92 to 1.79	1.06 to 2.09	1.04 to 2.22	1.70 to 3.78
Behavioural†	RR	1	1.53	1.49	1.48	1.84	1	1.02	1.15	0.99	1.52
	95% CI		1.20 to 1.95	1.18 to 1.88	1.12 to 1.95	1.38 to 2.47		0.71 to 1.46	0.80 to 1.65	0.65 to 1.49	0.98 to 2.37
Social‡	RR	1	1.40	1.41	1.38	1.73	1	1.17	1.30	1.21	1.89
	95% CI		1.09 to 1.78	1.11 to 1.80	1.02 to 1.87	1.26 to 2.38		0.83 to 1.64	0.91 to 1.98	0.80 to 1.82	1.22 to 2.93
Psychosocial§	RR	1	1.53	1.61	1.70	2.09	1	1.22	1.40	1.35	2.18
	95% CI		1.21 to 1.94	1.28 to 2.02	1.29 to 2.23	1.57 to 2.78		0.87 to 1.72	0.98 to 1.98	0.91 to 2.01	1.44 to 3.31
Biological¶	RR	1	1.58	1.66	1.83	2.28	1	1.40	1.47	1.39	2.45
	95% CI		1.24 to 2.01	1.32 to 2.09	1.39 to 2.41	1.71 to 3.03		0.99 to 1.98	1.03 to 2.11	0.93 to 2.08	1.61 to 3.73
Trajectories**		1	1.52	1.63	1.46	1.75	1	1.10	0.95	0.78	1.11
			1.16 to 2.00	1.14 to 2.33	0.95 to 2.24	1.05 to 2.92		0.70 to 1.71	0.56 to 1.62	0.39 to 1.53	0.46 to 2.69

*Adjusted for age and catchment area.
†Adjusted for alcohol consumption, physical activity, smoking, age and catchment area.
‡Adjusted for cohabitation, education, family income, outside working market, age and catchment area.
§Adjusted for social network, life control, job strain, age and catchment area.
¶Adjusted for body mass index, diabetes, hypertension, age and catchment area.
**Adjusted for trajectories of social mobility, age and catchment area.

biological factors were measured at inclusion or some years before inclusion, but could partly reflect a longer exposure window. The psychosocial factors were measured at inclusion and reflect the conditions in life and work at inclusion. The social factors attempt to measure exposures acting over the life course: education in early age, cohabitation and settling down often done in adulthood, family income and relation to working market at inclusion.

Controlling for social trajectories among men did not affect the early strong effect of adversity, but the accumulation gradient was diminished. For women both effects were diminished. Others have also found that the effects of cumulative measures of socioeconomic position decreases when directions of social mobility are accounted for.[15] This complicates the interpretation of the accumulation hypothesis as a simple dose–response relationship between exposure to socioeconomic adversity and risk of myocardial infarction. What matters is not only pure accumulation of adversity in itself but also how (social mobility) and when (critical period) the accumulation occurs.

The early and strong increase in risk after only a few years in adverse social positions has not been reported before, as it demands detailed information of the type available in our analysis. The uncertainty is large and the point estimates are fluctuating when studying just 1 year of adversity and continuously adding single years of accumulated adversity. In these in-depth analyses, the early and strong effect does not arise immediately but rather after a few years in adversity. The most plausible interpretation is that anyone can spend 1–2 years in adverse socioeconomic positions in between studies or jobs or when first entering the work market regardless of childhood or supposed future socioeconomic position. People originating from or with a destination to more favourable socioeconomic positions who end up being stuck in an adverse socioeconomic position for more than just a couple of years, seem to acquire more health-damaging experiences. We may also think of corresponding processes at the end of working life. We think that this finding of a rapid increase in risk after a few years of adversity indicates important selection processes that are complementary to the accumulation of exposure. Hence, it adds to the importance of taking social mobility and critical period into account when studying accumulation of socioeconomic position.

Table 3 Relative risk of myocardial infarction (with 95% confidence interval) and number of years in adverse socioeconomic position among men and women aged 45–70 years (adjusted for age and catchment area), Stockholm Heart Epidemiology Program 1992–4

		No of years in adverse socioeconomic position			
		0	1–5	6–10	11–15
Men	RR	1	1.44	1.59	1.53
	95% CI		0.96 to 2.15	1.09 to 2.32	1.06 to 2.20
Women	RR	1	0.6	1.51	1.27
	95% CI		0.29 to 1.23	0.78 to 2.91	0.77 to 2.12

Our analyses are dependent on the choice of reference group. We have chosen to categorise years in manual work as exposed to adversity. We could argue that especially for women lower non-manuals should be included in the exposed group, as many of the female least qualified lower non-manual workers are defined as inferior to skilled manual workers in the social stratification hierarchy.[33] If, for women, the lower non-manuals are redistributed from the reference group to the exposed group, the early and strong effect and the accumulation effects will increase, with a RR of 2.78 (95% CI 1.63 to 4.76) for the always-adverse women. Redefining lower non-manual men as exposed decreases the point estimates for the exposed groups slightly, but the early and strong effect and the accumulation gradient are still present, with a RR of 2.14 (95% CI 1.60 to 2.87) for the always-adverse category. Elaborating with varying cut-off points for the exposed groups for the proportions of the life course spent in adversity does not change the general results.

We used individual socioeconomic position to define adversity. If a household measure of socioeconomic position was available, we expected the accumulation gradient for women to increase. Some women in manual jobs were cohabiting with men from non-manual positions, and these individually classified manual (adverse) women would then, according to the household position, actually be classified as non-manual (not adverse). Another possible limitation is that during childhood (first 16 years in life), subjects were classified as either in adversity or not for the whole period. Restricting the analysis to accumulation of adverse socioeconomic position in adulthood from 20 years of age to inclusion showed similar early and strong effects and

What is already known

- Accumulation of risk has been introduced as a key concept in the life-course approach to the study of chronic disease aetiology.
- It has been suggested that accumulated experience of socioeconomic adversity, measured at a couple of time points in life, increases the risk of cardiovascular disease.
- This is the first study to have yearly information on socioeconomic position, allowing a better test of the accumulation hypothesis.

What this paper adds

- Accumulated experience of being in adverse socioeconomic position during the life course increases the risk of myocardial infarction and the effect is partly explained by the acquisition of health-damaging experiences.
- An early and strong effect from just being a few years in adverse socioeconomic position shows that there are both qualitative and quantitative steps in the exposure to the social stratification process.
- It seems that not only accumulation in itself but also how (social mobility) and when (critical period) accumulation occurs is of importance.

Policy implications

The findings point to the importance of a life-course approach to the reduction of socioeconomic inequalities in health and the prevention of myocardial infarction.

accumulation effects in men, but less distinct early and strong effect in women (data not shown).

In conclusion, the results support the hypothesis that accumulation of time spent in adverse socioeconomic position during the life course increases the risk of myocardial infarction, partly but not fully explained by the acquisition of health-damaging experiences or by how and when the experience of adverse social positions was accumulated. In addition, we found a strong effect after only a few years spent in socioeconomic adversity, indicating that the selection process differentiates between people in adversity for just a short period and those determined to stay longer in adverse positions. These findings question an overly simplistic interpretation of the accumulation hypothesis that the longer the time spent in socioeconomic adversity, the higher the morbidity. The data also indicate that how (social mobility) and when (critical period) the accumulation occurs has a role.

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