

risk factors independent of the individual's own SES, but the mechanisms have not fully been understood. Our aim was to assess the association of neighbourhood and individual SES with cardiovascular risk factors in an Eastern German population with exceptionally high cardiovascular mortality and unemployment rates.

Methods We used cross-sectional data of 1779 inhabitants of the city of Halle (Saale), aged 45–83 years, who participated in the population-based CARLA study. We calculated linear mixed models to assess the age-adjusted influence of neighbourhood SES (defined as neighbourhood-specific unemployment rates for 39 administrative districts of the city) and individual SES (defined as number of education years) on smoking (defined as number of currently smoked cigarettes/day), systolic blood pressure (SBP), and body mass index (BMI). Spatial dependencies within and between neighbourhoods were adjusted for by using ICAR models.

Results The unemployment rate ranged from 6.3 to 35.3% between neighbourhoods. For smoking, there was a statistically significant increase of 0.11 cigarettes smoked/day per 1% increase in the neighbourhood's unemployment rate in men (95% CI 0.09 to 0.12), and a decrease of 0.59 per increase in education years (CI –0.62 to –0.56), but a weaker association in women (regression coefficients (β) for unemployment rate and education years 0.054 (CI 0.039 to 0.067), and –0.21 (CI –0.24 to –0.19)). There was no statistically significant association of SBP with SES in men (β = –0.07 (CI –0.22 to 0.08) for unemployment rate, and –0.15 (CI –0.69 to 0.38) for education years), while in women, there was a statistically significant decrease in SBP of 0.79 mmHg per increase in education years (CI –0.82 to –0.76), and an increase with unemployment rate (β = 0.04, CI 0.03 to 0.06). BMI was statistically significantly associated with education in men and women (0.11 decrease in BMI per increase in education years in men (CI –0.14 to –0.08), and 0.35 in women (CI –0.38 to –0.33)), but only for women with unemployment (increase in BMI per 1% increase in unemployment rate 0.008 (CI –0.008 to 0.02) in men, and 0.036 (CI –0.38 to –0.33) in women. Spatial correlations within and between neighbourhoods were small for all of the assessed outcomes.

Conclusions Our findings confirm the previously described association of neighbourhood SES with smoking independent of individual SES, while we found inconsistent associations with SBP and BMI. The neighbourhood environment may be more relevant for behavioural than for biomedical risk factors.

035 HAVE SOCIO-ECONOMIC DIFFERENCES IN CORONARY RISK FACTORS CHANGED OVER YEARS? RESULTS FROM A POPULATION-BASED STUDY OF MEN BETWEEN 1978–1980 AND 1998–2000

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Background Although CHD mortality has declined in the UK since the late 1970s, the decline has been particularly marked among more affluent subjects. While the decline substantially reflects improvements in established coronary risk factors, little is known about how these have changed in different socio-economic groups.

Objective To examine whether socio-economic differences in coronary risk factors in Britain have changed over 20 years between 1978–80 and 1998–2000.

Design Prospective study of a socio-economically and geographically representative cohort.

Setting 24 British towns.

Participants 4132 men aged 40–59 years in 1978–80.

Main outcome measures Age-adjusted changes in coronary risk factor levels from 1978–80 to 1998–2000 according to social class were assessed. Coronary risk factors included blood pressure, cholesterol, body mass index (BMI), cigarette smoking and physical activity. Social class, based on longest-held occupation, was grouped as “non-manual” (social classes I, II, III non-manual) and “manual” (III manual, IV and V).

Results Overall, the prevalence of cigarette smoking declined and mean blood pressure and non-HDL cholesterol levels fell, while mean HDL cholesterol and BMI, and physical activity increased. The higher odds of being a current smoker in manual (lower) compared with non-manual (higher) social classes in 2000 (age-adjusted odds ratio 2.04; 95% CI 1.68 to 2.47) had not changed since 1978–80 (p for interaction social class*time 0.51). Men in manual occupations became less likely to be physically inactive compared with non-manual groups (p for interaction 0.04) and more likely to be moderate-vigorously active (p for interaction 0.005). The 20-year increase in mean BMI was 2.34 kg/m² in the manual compared with 2.01 kg/m² in the non-manual group (difference in mean change = 0.33 kg/m²; 95% CI 0.14 to 0.53; p for interaction 0.001). Mean systolic blood pressure declined more in manual than non-manual groups (difference in mean change = 3.6; 95% CI 2.1 to 5.3, p for interaction <0.0001). Non-manual groups had a greater mean decline in non-HDL cholesterol (difference in mean change = 0.18 mmol/l; 95% CI 0.11 to 0.25, p for interaction <0.0001) and a greater mean increase in HDL-cholesterol (difference in mean change 0.04 mmol/l; 95% CI 0.02 to 0.06, p for interaction <0.0001).

Conclusions Since the 1980s, socio-economic differences in blood pressure and physical activity may have been reduced, while those in cigarette smoking have persisted. Socio-economic differences in BMI, non-HDL and HDL-cholesterol levels appeared to have worsened, with more unfavourable changes in lower socio-economic groups. Continuing priority is needed to improve adverse cardiovascular risk profiles in socially disadvantaged groups in the UK.

Cancer survival

036 SOCIO-ECONOMIC INEQUALITIES IN CANCER SURVIVAL IN ENGLAND AFTER THE NHS CANCER PLAN

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Objectives Socio-economic inequalities in survival have been reported for most adult cancers in England. The NHS Cancer Plan (2000) aimed to improve cancer patient survival, and tackle inequalities in survival between people from deprived and affluent backgrounds. Recent observations suggest some improvements in survival have accelerated since implementation of the Cancer Plan. This study investigates the efficacy of the Cancer Plan in tackling inequalities in cancer survival.

Design We examined data for all adults registered in the National Cancer Registry and diagnosed with one of 21 common cancers in England during 1996–2006 and followed up to 31 December 2007. We defined *a priori* three calendar periods of diagnosis in relation to the NHS Cancer Plan: 1996–2000 (before the Cancer Plan), 2001–03 (initialisation) and 2004–06 (implementation).

Main outcome measures One-year relative survival by sex and socio-economic group for each of the 11 calendar years was estimated using a maximum-likelihood approach. Life tables by age, sex, calendar year, deprivation category and Government Office Region were used to control for the variability in background mortality. The “deprivation gap” (quantified as the difference between survival in the most deprived and most affluent groups) was estimated with variance-weighted linear regression. Changes in the deprivation gap

within and between the three successive calendar periods were also examined.

Results For patients diagnosed during 1996, 1-year survival in the most deprived group was lower than the most affluent group for 34 of the 35 cancer-sex combinations examined (27 significant at 5%). The figure was almost identical a decade later, in 2006, with lower survival in the most deprived group for 32 of the 35 cancer-sex combinations (23 significant at 5%). Although trends in the deprivation gap fluctuated between calendar periods, overall, between 1996 and 2006, the deprivation gap widened for 14 cancer-sex combinations (increasing by more than 2% for 3 cancers in women and 5 cancers in men), and narrowed for 21 (decreasing by more than 2% for 6 cancers in women and 1 cancer in men).

Conclusion For most cancers, the deprivation gap in survival has changed very little since the introduction of the NHS Cancer Plan. Despite small reductions in the deprivation gap for some cancers, there was no obvious acceleration in the reduction since the NHS Cancer Plan. Inequalities in cancer survival were still large for many cancers in 2006.

037 LUNG CANCER INCIDENCE AND SURVIVAL IN ETHNIC GROUPS IN SOUTH-EAST ENGLAND

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Objective Ethnicity has not been well recorded in UK cancer registries to date. However, Hospital Episode Statistics data are available for all inpatient admissions to English NHS hospitals and include self-assigned ethnicity, which can be linked to cancer registrations. This study aimed to use all the available ethnicity data to describe the different patterns of lung cancer incidence and survival in different ethnic groups in South-East England.

Design Population data from the 2001 Census were available by age, sex, ethnic group and socio-economic deprivation (using the income quintile of the Indices of Deprivation 2000). Age- and socio-economic deprivation-standardised incidence rate ratios were calculated for males and females in each ethnic group, using the White groups as the baseline categories. Overall survival for each ethnic group was also examined in males and females using Cox regression.

Setting South-East England population including Essex, Hertfordshire, London, Kent, Surrey and Sussex.

Participants There were 28 145 male and 18 257 female patients diagnosed with lung cancer resident in South-East England between 1998 and 2003. Results are presented for White, Indian, Pakistani, Bangladeshi, Black Caribbean, Black African and Chinese patients, apart from female survival results where due to small numbers the White, South Asian and Black ethnic groups were analysed.

Main outcome measures Age- and socio-economic deprivation-standardised incidence rate ratios; hazard ratios adjusted for age, socio-economic deprivation, stage of disease and treatment.

Results Compared with ethnic groups of the same sex, Bangladeshi men, White men and White women had the highest incidence rates. Differences between the White baselines and other ethnic groups were larger for women than for men. Bangladeshi men had consistently better survival estimates compared with White men (fully adjusted hazard ratio (HR) 0.46, $p < 0.001$). Indian (HR 0.84, $p = 0.048$), Black Caribbean (HR 0.87, $p = 0.47$) and Black African (HR

0.68, $p = 0.007$) men also had better survival estimates. South Asian (HR 0.73, $p = 0.006$) and Black (HR 0.74, $p = 0.004$) women had similar better survival than White women.

Conclusions Lung cancer incidence is closely related to smoking, and prevention messages need to be targeted for different ethnic groups taking into account language and relevancy to ensure no groups are excluded. The apparent better survival of South Asian and Black patients was surprising, and more detailed follow-up studies are needed to verify these results.

038 SURVIVAL FROM CHILDHOOD AND YOUNG ADULT CANCER IN THE NORTH OF ENGLAND, 1968–2005

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Objective To investigate survival from cancer in children and young adults resident in the North of England.

Methods Cases aged 0–24 years diagnosed with a primary malignancy during the period 1968–2005 were obtained from the Northern Region Young Persons' Malignant Disease Registry. Survival rates at five years were calculated using Kaplan-Meier estimation, for each diagnostic group, within four successive time periods 1968–1977, 1978–1987, 1988–1997 and 1998–2005. Cox regression analysis was used to investigate factors that may influence survival. Analyses were carried out separately by gender and age group (0–14, 15–24 years).

Results There were a total of 5917 cancer cases; 2958 aged 0–14 years (1659 males, 1299 females) and 2949 aged 15–24 years (1592 males, 1357 females). For childhood cancer (aged 0–14) five year survival rates for all cancers improved significantly ($P < 0.0001$) from 39% in 1968–1977 to 60% in 1978–1987, 75% in 1988–1997 and 79% in 1998–2005. From the earliest to the latest period the survival rate for leukaemia increased from 24% to 81% ($P < 0.0001$), lymphoma from 46% to 87% ($P < 0.0001$), central nervous system tumours (CNS) from 43% to 73% ($P < 0.0001$), sympathetic nervous system tumours from 17% to 66% ($P < 0.0001$), bone tumours from 21% to 75% ($P < 0.0001$), soft tissue sarcoma from 30% to 58% ($P = 0.0001$) and for germ cell tumours from 59% to 97% ($P = 0.0002$). Cox analysis showed worse survival for acute lymphocytic leukaemia (ALL) and astrocytoma in the age group 10–14 years. For cancer in teenage and young adults (aged 15–24) five year survival rates for all cancers improved from 47% in 1968–1977 to 62% in 1978–1987, 75% in 1988–1997 and 83% in 1998–2005. From the earliest to the latest period the survival rate for leukaemia increased from 2% to 57% ($P < 0.0001$), lymphoma from 66% to 87% ($P < 0.0001$), CNS tumours from 52% to 81% ($P = 0.002$), bone tumours from 35% to 55% ($P = 0.02$), germ cell tumours from 41% to 95% ($P < 0.0001$) and carcinomas from 56% to 93% ($P < 0.0001$). Survival was worse for ALL in the age group 20–24 years but better for non-Hodgkin lymphoma.

Conclusions There have been marked improvements in survival from childhood and young adult cancer in the North of England over the last four decades. Future work should analyse geographical and socio-demographic patterns for survival rates.