Oral communications

001 LIFE IMPAIRMENT DUE TO ASTHMA IN PATIENTS FROM THE GENERAL POPULATION. RESULTS OF THE EUROPEAN COMMUNITY RESPIRATORY HEALTH SURVEY (ECRHS) – II

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Introduction: According to the Global Initiative for Asthma (GINA) Guidelines, well treated asthmatics are expected to have no limitation of their daily life activities. The aim of this study was to evaluate life impairment and its determinants in adult asthmatics from the general population.

Methods: Life impairment (production losses and leisure time forgone) and hospitalisation (emergency department visits and hospital admissions) were assessed in the frame of the ECRHS-II, a multicentre population based survey performed in 1998–2000 on the adults (28–56 years old) from 13 Western countries who participated in the ECRHS in 1991–1993. For the purpose of the present analysis, the 1291 subjects who reported current asthma confirmed by a doctor at a clinical interview were considered. Asthma severity was classified according to the GINA criteria. Multilevel logistic regression models were used to evaluate the predictors of life impairment and hospitalisation.

Results: 58%, 10.8%, 14.8%, and 16.4% of the patients were intermittent, mild, moderate, and severe persistent asthmatics, respectively. The percentage of subjects who lost at least one working day because of the disease in the previous year was 16.4% (median number of days 7; interquartile range, IQR 3 to 14 days), ranging from 12.1% among intermittent asthmatics to 29.4% among severe persistent patients, whereas 12.4% of the subjects reported at least one impaired day (median number of days 24; IQR 12 to 60 days), ranging from 8.7 to 20.3% according to the level of disease severity. Six per cent of the subjects had at least one hospitalisation in the past 12 months. The risk of life impairment and the risk of hospitalisation were significantly higher for severe persistent asthmatics than for intermittent patients (OR 3.00; 95%CI 1.88 to 4.81; and OR 4.64; 95%CI 2.33 to 9.24, respectively). Sex (female) (OR 1.61; 95%CI 1.12 to 2.32) and low education level (OR 1.49; 95%CI 1.00 to 2.20) were positively associated with the risk of life impairment.

Conclusions: Life impairment is still a substantial problem for adult asthmatics: on average, one patient out of six lost 7 working days and one patient out of eight was impaired for 24 days per year.

002 SUICIDE AND SPOUSES' PSYCHIATRIC ILLNESS OR SUICIDE

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Introduction: This study aimed to estimate the risk of suicide among people whose marital partner has been admitted with a psychiatric disorder or has died by suicide or other causes.

Methods: Danish population based registers were used to identify the 9011 people aged 25–60 years who had committed suicide during 1982–1997, and 18 0220 age–sex time matched controls and their spouses.

Results: The risk of suicide was increased in people whose spouse had been first admitted after December 31 two years earlier (RR 4.97; 95% CI 3.46 to 7.14), whose spouse had committed suicide (RR 22.13; 95% CI 11.30 to 43.35) or died by other causes (RR 7.67; 95% CI 4.98 to 11.81). The suicide rate was unrelated to spousal concordance for psychiatric admission and spousal diagnosis.

Conclusion: The suicide risk is increased in spouses whose partners suffer from a psychiatric disorder or have committed suicide. The mental illness and suicide of a spouse can have a huge impact on the other spouse, and this impact is not necessarily genetically mediated.

003 INCIDENCE OF TESTICULAR TUMOURS IN CAR MANUFACTURING WORKERS

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Introduction: A cluster of testicular tumours in one car manufacturing plant gave rise to a suspected occupational cause. Exposure to electromagnetic fields during resistance welding operations was considered a possible hazard. An incidence study was conducted to describe the occurrence of the disease in different manufacturing plants by department and time period and to find out whether the incidence rate was raised above expected values of a reference population.

Methods: The cohort comprised 167 212 men employed between 1989 and 2000 in six different plants. Over the study period, 160 incident cases were identified through health insurance records. The age–period specific incidence of testicular cancer from the Saarland for the same time period was used as a reference for the calculation of crude and standardised incidence ratios (SIRs, Segi truncated world standard, 15–69). Internal comparisons between departments and plants were carried out using Cox regression. 95% CIs were calculated for SIRs and risk ratios (RR).

Results: The average age of the cohort was 40.7 years. The study confirmed the suspected excess incidence in plant A, which was 66% above the expected rate. In the total cohort, the standardised incidence rate was 9.18 (95% CI 7.46 to 11.30) for the whole period, 6.37 (95% CI 4.29 to 9.45; n = 52 cases) between 1989 and 1995, and 11.42 (95% CI 9.35 to 13.96; n = 108) between 1996 and 2000. For the early period the typical peak of the incidence between 25 and 40 years of age was missing. Compared with the Saarland, the SIR for the early period was below expectation (SIR 0.52; 95% CI 0.39 to 0.68), whereas it was increased in the second half (SIR 1.1; 95% CI 0.89 to 1.30). In plant A the corresponding SIRs were (SIR 1.02; 95% CI 0.56 to 1.84; n = 11) and (SIR 2.18; 95% CI 1.43 to 3.31; n = 22) for the early and late period, respectively. Overall, the excess risk was most pronounced in the older age groups above 50 years, particularly in plant A with an SIR of 24.24 (95% CI 10.47 to 47.77; n = 8). The internal comparison revealed increased risk ratios in the following work areas, where all other areas served as reference: maintenance (RR 2.4; 95% CI 1.05 to 5.41), administration/office work (RR 1.7; 95% CI 1.08 to 2.67), assembly line (RR 1.4; 95% CI 0.94 to 2.05), and machine assembly (RR 1.4; 95% CI 0.94 to 2.07).

Conclusions: The analysis stratified by work areas may give first clues for possible disease risks. However, the classification has to be considered as preliminary. It does not give sufficient information about possible exposures. Moreover, the reduced incidence for the early study period indicates a possible underreporting of cases. Currently an incidence validation study is under way to clarify this issue and to provide data for a nested case control study that should provide more insight into possible explanations for our observations.

004 PERIPHERAL ARTERIAL DISEASE AS AN INDICATOR DISEASE FOR GENERALIZED ATHEROTHROMBOSIS: RESULTS FROM THE GETABI STUDY

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Introduction: Previous studies in selected patient samples suggested a high risk for total mortality and cardiovascular morbidity associated not

only with symptomatic, but also with asymptomatic peripheral arterial disease (PAD).

Objectives: Our aim was to assess the 1 year risk of death and cardiovascular morbidity associated with PAD in a large, unselected sample of elderly patients in primary care. In addition, the strength of association between low ankle brachial index (ABI, as indicator for PAD) and various accepted risk factors for PAD, and death and outcome was quantified.

Methods: In a prospective cohort study, the German epidemiological trial on Ankle Brachial Index (getABI), 6880 unselected patients ≥65 years were followed up by 344 primary care physicians. Main outcome measures were 1 year mortality due to all causes, mortality due to cardiovascular and cerebrovascular disease, and severe vascular events (myocardial infarction, coronary revascularisation, stroke, revascularisation at carotids, amputation, or peripheral revascularisation because of PAD).

Results: The baseline characteristics of the patients were as follows: mean age 72.5 years, 58% females, 46% (ever) smoker, 65% hypertension, 25% diabetes mellitus, 52% lipid disorders. The prevalence of PAD in the cohort was 18.0%. At 1 year, all cause mortality was 2.8% in patients with PAD and 0.9% in patients without PAD (odds ratio (OR) adjusted for known risk factors: 2.0; 95% CI 1.3 to 3.3). Mortality due to CHD or CVD was 1.6% v 0.4% (adjusted OR 2.5; 95% CI 1.3 to 4.9). Severe vascular events or death occurred in 8.3% of PAD patients, and in 2.7% of patients without PAD (adjusted OR: 2.2; 95% CI 1.6 to 2.9). Patients with PAD and at least 2 of the following 3 additional risk factors—diabetes, (ever) smoking, history of severe cardiovascular or cerebrovascular events—had a substantially increased risk of dying or suffering from a severe vascular event during follow up in comparison to patients without PAD and at most one additional risk factor: 13.9% v 2.0% (adjusted OR 6.2; 95% CI 4.2 to 9.0).

Conclusions: Patients with PAD have an increased risk for (short term) all cause mortality and severe vascular events. Hence, PAD is closely associated with other manifestations of atherosclerosis (''indicator disease''). In a real life setting the ABI is a useful means of identifying patients with PAD and thus with advanced atherosclerotic disease. A subgroup of patients with a substantially increased risk can be identified when three risk factors, which can be obtained very easily, are taken into account additionally.

005 RISK FACTORS TO FOETAL DEATHS IN SÃO PAULO, BRAZIL

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Introduction: Perinatal mortality rate in São Paulo City is declining, but fetal mortality has rarely been studied and its risk factors are almost unknown. Social and health inequalities are important in São Paulo and fetal mortality was 932/1000 births in 2002, ranging from 623 to 1034 from the richer to the poorer areas. The south region of the city was selected to carry out a perinatal and fetal mortality study because of its inadequate living and health conditions.

Methods: This is a population based case-control study. Cases and controls were selected from the vital statistics information system from mothers living in the South region of São Paulo city (01/08/2000 to 31/01/2001). Cases (172) included fetal deaths with weight 500 g and over. Controls (313) were obtained by random sampling of the survivors. Home interviews were performed and data were obtained from hospital records. Variables were grouped into blocks according to the conceptual framework, from distal to proximal pathway: socioeconomic, obstetric history and maternal conditions, gestational conditions, and delivery conditions. The data were modelled by hierarchical multiple logistic regression. The variables were adjusted within each block, which were added subsequently.

Results: To classify fetal deaths we used the clinical information of the delivery hospital. Antepartum deaths (156) represented 90.6% of fetal deaths, intra-partum (8) 4.7% and 8 (4.7%) remained unclassified, but these showed the same characteristics as ante-partum deaths, and were grouped (164). Modelling process analyses showed that socioeconomic variables associated were: mother being unmarried (OR 2.98; 1.83 to 4.87), being married less than 1 year (OR 2.79; 1.43 to 5.46) and having had less than 3 years of education (OR 1.91; 1.10 to 3.33). Including maternal history remained significant: mothers having had previous low weight birth (OR 2.20; 1.22 to 3.99). Including variables related to this gestation remained significant: mother being unmarried

(OR 2.67; 1.24 to 5.72); being married <1 year (OR 1.87; 1.06 to 3.33); vaginal bleeding (OR 5.19; 1.82 to 14.81), presence of hypertension (OR 2.87; 1.40 to 5.88), inadequate pre-natal care (OR 2.75; 1.75 to 4.32), pregnancy weight gain less than 6.0 kg (OR 2.40; 1.42 to 4.05), diabetes (OR 32.97; 3.72 to 292.21). Adding delivery conditions were significant causes of premature delivery, both those identified (OR 12.04; 4.18 to 34.72) and unidentified (OR 6.09; 2.69 to 13.78); mothers transport to hospital by bus/friends cars (OR 2.41; 1.6 to 5.45), and low birth weight (LBW) (OR 12.39; 6.44 to 23.81). Final model included vaginal bleeding (OR 6; 1.5 to 23.3), hypertension (OR 2.5; 1.02 to 6.3), diabetes (OR 22.3; 1.7 to 290.05), identified/ unidentified prematurity (OR 6.1; 2.7 to 13.8; OR 12.0; 4.2 to 34.7), transportation (OR 2.4; 1.1 to 5.5) and LBW (OR 12.4; 6.4 to 23.8).

Conclusions: Ante-partum deaths are the main component of fetal mortality in the south of São Paulo, as in developed countries, but with higher rates. Even though socioeconomic variables did not remain in the final model, mother's social vulnerability might work through proximal variables such as gestational and delivery conditions (transportation, hypertension, prematurity, and LBW). Adequate health care may have impact in some of these factors, while others can be more difficult to prevent and treat.

006 SPATIAL ANALYSIS OF CARDIOVASCULAR MORTALITY IN PORTUGAL, 1992–2000

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Introduction: In spite of the decrease in cardiovascular mortality in industrialised Western countries, in Portugal, cardiovascular diseases are the leading cause of death and one of the major causes of serious, long term disability among adults.

Objectives: The aim of this study was to analyse the geographical distribution of stroke and coronary heart disease mortality in Portugal, on a municipality level, from 1992 to 2000.

Methods: Mortality data were obtained from the National Mortality Database, aggregated by municipality, with information on number of deaths by cause, sex and age group (10 years), from 1992 to 2000. The data were grouped into 3-year time periods (1992–1994, 1995–1997, and 1998–2000) and the middle period estimated population was used to calculate the indirect age standardised mortality rates of stroke and coronary heart diseases for both sexes. Changes in age standardised death rates were calculated and compared between the three periods. We used a Geographical Information System to identify spatial patterns in the geographical distribution of the mortality rates.

Results: The mortality rates for both diseases present distinct geographical patterns, with the highest mortality rates of stroke in the north of Portugal, and the highest mortality rates of coronary heart in the south of the country. The mortality rates for stroke had decreased from 734.77 per 100 000 in the first period to 638.02 per 100 000 in the last period (13% reduction), while the coronary heart disease had decreased from 283.47 per 100 000 to 262.99 per 100 000 (7% of reduction), respectively. Although the general rates for Portugal have been reduced in the study period, some particular regions had the mortality rates increased. This is the case for Alentejo, in south Portugal, whose mortality rates of stroke had increased about 8% and also the case of the central east of the country, with an increase of about 40% in the mortality rates of coronary heart diseases in the study period.

007 GEOGRAPHICAL DISTRIBUTION OF HIP FRACTURES IN PORTUGAL, 2000–2002

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Osteoporosis, defined as a skeletal disorder characterised by compromised bone strength predisposing to an increased risk of fracture, affects million of people around the world, with a tendency of increasing incidence rates, due to the aging of the population and due to the increase of risk factors. The most visible and dramatic consequences of osteoporosis are osteoporotic fractures that can occur mainly on three skeleton sites: proximal femur (hip), vertebrae, and distal forearm (wrist). Of those, the hip fractures are considered the most serious osteoporotic fractures, because they almost invariably lead to hospital admission for surgical intervention. The mortality and morbidity rates are both increased in persons who had an osteoporotic hip fracture. Therefore, because hip fractures are almost always treated in public hospitals they are highly documented and easy to count. Some authors consider that

hip fractures can be considered a barometer of osteoporosis. Although the osteoporotic fractures vary among different countries, and inside the same country among different areas, suggesting an important paper of environmental and geographical factors, few epidemiological studies have been presented considering the geographical distribution of the cases.

The objective of this study is to identify spatial patterns of femur fractures incidence in Portugal, through the use of Geographical Information Systems—GIS and Spatial Statistical Analysis.

The health data being used in this project are from the National Hospital Inpatients Data Register managed by the Health Informatics and Financial Management Institute (Instituto de Gestão Informática e Financeira da Saúde; IGIF) of the Portuguese Health Ministry. This database contains all the admissions with a diagnosis related to femur fracture that occurred between the years 2000 and 2002 and variables such as sex, age, cause of admissions, and provenience. We selected the registers that occurred in individuals with 50 or more years of age, with diagnosis classified as ICD9-CM codes: 820.x and cause of admission with ICD9-CM codes: E880, E881, E884, E885, E886, E887, and E888.

The demographic and socioeconomic data comes from the 2001 Portuguese Census.

We computed the number of patients with 50 years or more for each municipality according to sex and age (5 year age group), and calculated the age and sex direct standardised rates. The local empirical Bayesian estimator adjusted the incidence rates. The results showed that the incidence of osteoporosis increased with age and was higher in women than in men. Clusters of high rates were identified in the south and northeast of continental Portugal, as well as in the littoral between Lisbon and Aveiro city, we also identified clusters of low rates northwest and central inland.

In conclusion, the incidence of osteoporosis has different spatial patterns within the Portugal mainland territory.

008 PROJECTIONS OF HIV/AIDS CASES IN PORTUGAL

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Introduction: A statistical procedure called Back calculation has been a widely used method to estimate the size of the population with HIV/AIDS. Recent discussions suggest that this method should be adapted to take into account the effect of treatment. The aim of this study is to use that method and a worst case scenario, in order to assess the quality of previous projections and obtain new ones.

Methods: The AIDS incidence data were adjusted, taking into account reporting delays, no reporting, and underreporting. A conditional likelihood estimation of the reporting delay distribution was performed using standard algorithms for Poisson regression. Then lower bounds on the size of the AIDS epidemic were obtained. A Weibull and Gamma distribution were considered for the latency period distribution. The EM algorithm was applied to obtain maximum likelihood estimates of the HIV incidence. The density of infection times was parameterised as a step function. The National AIDS/HIV database was used and the methodology was applied to four different transmission categories, injecting drug users (IDU), heterosexual, homo/bisexual and ''other'', to obtain short term projections (2002–2005) and an estimate of the minimum size of the epidemic.

Results: 2002–2005 projections show an annual decrease of new AIDS cases for the IDU and the homo/bisexual transmission categories. For the year 2003 (in comparison with 2002) a decrease of 7.3% is expected in IDU. In this category the number of new cases is estimated to decrease by 9.5% in 2004 and to suffer a further decrease of 11.8% in the year 2005. However, the heterosexual and the other are estimated to increase. In the first category the increase rate is not very pronounced: in 2003 the incidence is 5.5% higher than estimated for 2002, in 2004 is 3.5% higher when compared to 2003 and 1.3% in 2005 relatively to 2004. In the second, the expected annual increase rate for the number of new AIDS cases is very significant: in 2003 the incidence rises 36% compared to 2002, in 2004 29% higher than in 2003, and in 2005 23.3% higher than in 2004.

Conclusion: This study outlines a methodology for obtaining projections on the size of the AIDS epidemic. It produces a lower bound, because it only estimates the cumulative numbers of individuals that will eventually develop AIDS from those already infected with HIV. The projections indicate for the next few years: an increase in the annual number of AIDS new cases in the heterosexual and other transmission categories, with special incidence on this last one; a slowing down of the annual number of new AIDS cases in the IDU transmission category; an apparent change on the decrease tendency in the homo/bisexual

category. These projections indicate that HIV/AIDS will remain a public health problem in Portugal.

009 OBESITY AND QUALITY OF LIFE IN ADOLESCENTS

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Background: Overweight and obesity may interfere with social, psychological, and physical activities. This study aimed to analyse the association between obesity and health related quality of life (HRQOL) in adolescents.

Methods: We designed a cross sectional study involving 2144 students (51.5% females) aged 12 to 18 years (14.8; SD 1.7) among seven secondary schools from Viseu, Portugal. Participants completed a self administered questionnaire. Body mass index (kg/m^2) was calculated from self reported height and weight and classified into tree groups: normal weight ($<$24.9), overweight (25.0 to 29.9), and obese ($\geqslant$30.0) according to the adolescent's international body mass index cut off points for overweight and obesity by sex and age. HRQOL was assessed by SF36 (ranging from 0 to 100) assessing nine dimensions: physical functioning, social functioning, role limitations physical, bodily pain, general medical health, mental health, role limitations mental, vitality, and general health perceptions. Proportions were compared by χ^2 test and continuous variables by Kruskal Wallis test.

Results: Overweight prevalence in total sample was 12.6% (13.4 in boys and 11.8 in girls) and obesity was 3.7% (4.1% in boys and 3.4% in girls). Obesity in girls was associated with significantly lower total scores of HRQOL (64.6 (SD 11.3) v 70.6 (SD 12.9) p = 0.02). Overweight was associated with impaired physical well being among girls. In boys, no significant differences were found between overweight and not overweight. Obesity was associated with lower general health perception and poorer physical functioning (girls only) but did not impaire emotional well being.

Conclusion: The presence of obesity is associated with impaired HRQOL only in female sex, with deterioration in physical but not emotional well being. The impairment found in HRQOL in obese girls can be associated with restrictions in daily life.

010 NO INCOME INEQUALITIES IN 30 DAY MORTALITY AFTER CORONARY ARTERY BYPASS GRAFT SURGERY IN ITALY

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Introduction: Tackling inequalities in health after surgical procedures has just recently begun receiving more emphasis, and findings are controversial.

Objective: To investigate the association between income and 30 day mortality after coronary artery bypass graft (CABG) surgery in Italy.

Methods: We used discharge abstract data to define a cohort of 7163 patients (age $\geqslant$35 years) residents in Rome, Milan, and Turin who underwent isolated CABG surgery (ICD IX code: 36.1) between 1997 and 2000. Vital status 30 days after CABG surgery was obtained from the Municipal Registries. Census tract median income (CTMI) was computed by a record linkage between Tax and Population Registers for the three cities (4.8 million residents). The CTMI distribution was divided into five quintiles ranging from very underprivileged (I quintile) to very well off (V quintile). We evaluated the association between 30 day mortality and the income quintiles using a multiple logistic regression model with empirical risk adjustment (Odds Ratios, OR, and 95% CI). A priori risk factors considered were: age, type of ischemic heart disease, comorbidities, and previous heart surgery. We used two different risk adjustment models for males and females.

Results: In the CABG cohort 82.0 % of patients were males. The mean age was 65.4 years (SD 8.9), patients in the lowest income quintile seem to have CABG earlier in their lives (mean age 64.6 years, SD 8.7 v 66.3 years, SD 8.7 in the V quintile). 21.5% of the cohort was in the I income quintile v 18.4 % in the V quintile. The overall 30 day mortality was 2.2%; 2.6% in the I income quintile and 2.0% in the V income quintile. The crude OR association between 30 day mortality after CABG surgery and income level was 0.76; 95% CI 0.46 to 1.24. After adjusting for the potential confounders no protective effect of the highest income on 30 day mortality was found (for the V level, OR 0.79; 95% CI 0.48 to 1.30). No significant confounding effect of the risk factors was observed.

Conclusions: Income level did not influence early mortality after CABG surgery in Italy in the period under study. Other outcomes such as

6 month mortality and hospital re-admission for coronary revascularisation should also be examined to draw more definitive conclusions about possible inequalities in CABG effectiveness in the Italian NHS.

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011 COMPARING MODELLING STRATEGIES FOR LONGITUDINAL DATA: THE EFFECT OF VITAMIN A IN CHILDHOOD DIARRHOEAL DISEASE

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Introduction: The choice of modelling strategies can improve or impair the best designed studies. It is well known the role of recent developed techniques, such as generalised estimating equations and random effects models, on analysing longitudinal data. On the other hand, late updates on survival analysis models allow the inclusion of time dependent covariates, multiple events, and random effects. In this paper we compare the use of these methods in a longitudinal study on the effects of Vitamin A in preventing childhood diarrhoeal disease.

Methods: Data come from a randomised, double blind, placebo controlled clinical trial where over 1000 children aged 6–48 months were assigned to receive either vitamin A or placebo every 4 months over 1 year. Demographic, clinical, nutritional, and socioeconomic characteristics were collected at the baseline. The subjects were visited at home three times a week, to register the number of liquid or semi-liquid motions a day. Three response variables were considered: number of liquid or semi-liquid motions per week, numbers of days with diarrhoea per week, in the longitudinal models; numbers of days without diarrhoea in the survival models.

Results: The survival models are more comparable to the longitudinal models for the number of days with diarrhoea, because both of them model the occurrence of diarrhoea episodes. For the two ways of looking at the problem, no significant effect was found for the vitamin A supplementation. The only significant effect was found when modelling the severity of the disease using the number of liquid or semi-liquid motions per week. The most important covariates were the age of the child, as expected, and the number of domestic appliances (refrigerator, radio, TV).

Conclusion: The comparison of the models showed reasonable consistency; even the differences found can be attributed to different measures and ways of looking at the problem. The major benefit of trying those various models is the ability of detecting small change in point and confidence interval estimates, including independent variable of interest and all potential risk factors. The variety of statistical models is increasing sharply with the development of statistical tools and availability of software. Unfortunately the choice among them is usually more dependent on previous knowledge than on the real question addressed by the study. Quite often data like these are only analysed using simple summary measures in classical models easily adjusted in common statistical packages, causing loss of information so hardly gathered. There is a strong need in the epidemiology environment of incorporation of an entire set of statistic techniques dealing with dependent data, particularly from longitudinal studies.

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012 IS IT POSSIBLE TO REDUCE AIDS DEATHS WITHOUT REINFORCING SOCIOECONOMIC INEQUALITIES IN HEALTH?

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Introduction: The use of highly active antiretroviral therapy (HAART) is associated with impressive improvements of AIDS survival after the mid 1990s in affluent countries with a high access to these medications. However, HAART has also been reported as a factor for the increase of socioeconomic inequalities in health, because of unequal access and adherence to treatment. The objective of the present study was to describe trends of AIDS mortality in the city of São Paulo, Brazil, from 1995 to 2002. In particular, we aimed at assessing the association between the annual percentage decrease of AIDS mortality and socioeconomic characteristics of the city's boroughs, in a context of large scale and cost free distribution of HAART.

Methods: The gathering of population data and information from death certificates allowed the calculation of AIDS yearly death rates for each district of the city, as adjusted by age group and sex distribution. The characterisation of areas assessed income, educational attainment, living conditions, and the human development index. Trend estimation used the auto regression procedure of exact maximum likelihood estimation for time series analysis. The study of association between the annual percentage decrease of AIDS deaths and socioeconomic indices used three schemes of regression analysis: ordinary least squares, simultaneous autoregressive, and conditional autoregressive.

Results: AIDS mortality decreased in São Paulo from 32.1 deaths (per 100 000 inhabitants) in 1995 to 11.2 in 2002. This reduction corresponded to an annual percentage decrease of 16.9%. The decrease of rates was concurrent with a shrinking variation of figures among the districts, as a steeper decline of AIDS deaths was observed for areas with higher prior levels (1995) of mortality. Although the decline of AIDS mortality was not homogeneous in the city, discrepant patterns of decrease in the districts did not associate with figures of social development, with all correlation coefficients corresponding to p values higher than 0.27. Map production indicated that districts with different levels of decrease were similarly distributed in the more affluent central portion of the city, and in its poorer peripheral areas.

Conclusions: The evidence gathered in the present study suggests that the recent reduction of AIDS deaths in São Paulo was not influenced by major estimates of SES indices of the city's neighbourhoods. The overall reduction of rates and a higher decrease in areas with higher prior levels of deaths indicate that the Brazilian programme of AIDS treatment may have effectively contributed to the reduction of inequalities in the profile of AIDS deaths. Despite its recent decline, mortality from AIDS related conditions remains a major problem of public health, and efforts of health promotion must take account of new challenges posed by the changing epidemiologic pattern of AIDS indices in the country.

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013 ASSESSING PRESENT HEALTH STATUS AND PREDICTING FUTURE HEALTH EXPENDITURES THROUGH ADMINISTRATIVE DATABASES

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Introduction: Present health status is generally related to future resource consumption, and a measure of the prospective relationship between health conditions and care costs is needed to cope with the financial uncertainty of providing care to people with specific diseases. In most developed countries, large administrative databases on the health services delivered are currently available. These provide information on individual health status and might represent a cost effective tool in predicting further health expenditures.

Methods: We used hospital discharge abstract databases from two Italian regions (over 10 000 000 inhabitants). The databases include information on every hospital admission, including up to six discharge diagnoses and six treatments, both coded according to the ICD9-CM. Demographic information and an individual identity code is also available. We used data referring to a two year interval (1997–1998) to select a cohort of diabetic patients aged 15 to 80 years to attribute them a score of disease severity and to identify comorbidities. We then followed them up for hospitalisation in the next 3 years (1999, 2000, and 2001) to assess how baseline clinical characteristics could affect subsequent health expenditures and to construct algorithms aimed at predicting costs. The reimbursement attributed to each episode of care by the Italian prospective payment system, based on the Diagnosis Related Groups (DRG) classification, was used as a proxy of health expenditures. We developed a two step predictive model for subsequent expenditures by combining a multivariate logistic regression model, to predict the probability of (at least) one subsequent admission, and a generalised linear model, with logarithmic link function and Gamma distribution, to predict the expected hospital cost of admitted patients. Both models accounted for demographic variables, past hospitalisations, and comorbidities. Health expenditures of each diabetic patient could then be individually predicted by multiplying the probability of being admitted and the predicted cost of admission(s).

Results: Of the 70 519 diabetic patients selected, 57% were classified as having mild diabetes, 34% as moderate, and 9% as severe. 31% of patients were 60–69 years old and 39% were 70–79 years old. 68% of the patients presented at least one chronic comorbidity. During the 3 year follow up, 1.7 admissions per patient were reported, for 16.6 days of average hospital length of stay and a €4700 average hospital cost. After the modelling step, the observed 3 year hospital cost averaged €2944 in the lowest quintile of predicted cost and €7807 in the highest quintile of predicted cost.

Conclusions: Administrative data can be used to collect information on individual health status and health expenditures. Regression models can be developed to reliably predict future resource consumption and health expenditure in subgroups of patients with chronic diseases.

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014 CONGENITAL STRUCTURAL MALFORMATIONS IN THE OFFSPRING OF WOMEN WITH EPILEPSY

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Introduction: Use of antiepileptic medication during pregnancy is associated with increased risk for congenital malformations in the offspring. Most previous studies on malformations in the offspring of patients with epilepsy have been hospital based with small and selected study populations.

Objective: The aim of this study was to obtain valid and accurate estimates on major congenital malformations in the offspring of patients with epilepsy in a large population based cohort of women with epilepsy.

Methods: All women (n = 6535) who were approved as eligible for full reimbursement for antiepileptic medication for the first time between 1985 and 1994 from the Social Insurance Institution of Finland (KELA) were identified from the KELA database. A reference cohort (n = 14 704) was identified from the Finnish Population Register Center. Information on live births (n = 7548) was obtained from the Medical Birth Register maintained by STAKES—the National Research and Development Center for Welfare and Health. Information on malformations (n = 555) was obtained from the Finnish Register of Congenital Anomalies maintained also by STAKES.

Results: The overall prevalence of malformations and the proportion of offspring with multiple malformations were more than twice as high in the offspring of mothers with epilepsy as in the offspring of mothers without epilepsy. The greatest absolute excess (4–7/1000 births) was observed in cardiovascular malformations, congenital malformations of urinary system, limbs, genital organs, and spina bifida. The risk for spina bifida (OR 11.32; 95% CI 2.34 to 108) and congenital malformations of genital organs (OR 8.39; 95% CI 2.16 to 47.5) was substantially elevated in the offspring of mothers with epilepsy. The risk for congenital malformations varied slightly by maternal age at delivery, but no clear trend was observed. The risk increased with duration of epilepsy (p = 0.02 for trend).

Conclusion: Risk for certain major congenital malformations is elevated in the offspring of patients with epilepsy, especially among those with long duration of maternal epilepsy.

015 PREVALENCE OF STRUCTURAL AND FUNCTIONAL CARDIAC ABNORMALITIES ACCORDING TO FACTORS OF THE METABOLIC SYNDROME

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Introduction: The importance of clustering and interaction of cardiovascular risk factors, expressed in the definition of the metabolic syndrome, has been increasingly emphasised in the prediction of cardiovascular diseases, particularly coronary heart disease (CHD). The aim of this study was to assess the prevalence of objective structural and functional cardiac abnormalities according to factors that define the metabolic syndrome, either alone or in association.

Methods: Cross sectional study for which community participants aged ⩾45 years were recruited. Data were collected by clinical interview, including Rose's questionnaire, physical examination, ECG, echocardiogram, and fasting venous blood sample collection. Metabolic syndrome was defined according to NCEP as the presence of at least three of the following: blood pressure (BP) ⩾130/85 mm Hg, triglycerides ⩾150 mg/dl, HDL <40 mg/dl in men, and <50 mg/dl in women, fasting glucose ⩾110 mg/dl, and waist circumference ⩾102 cm in men and ⩾88 cm in women. CHD was considered when there was history of angina or myocardial infarction, either self reported or according to Rose's questionnaire, or pathological Q waves on ECG. We calculated age, sex, and education adjusted prevalence or means and their 95% CI, by logistic and linear regression, respectively.

Results: As shown in the table, the prevalence of CHD, left ventricular systolic dysfunction (either defined by the subjective impression of the ecographist eyeball or as ejection fraction<45%), left ventricular hypertrophy (LVH), and impaired relaxation was larger in subjects with metabolic syndrome and progressively increased with the number of factors present. There was also a positive and progressive association with the mean value of left ventricular mass index (LVMI), and inverse with the E/A ratio. When analysing each factor separately, the waist circumference and fasting glucose were the ones that were more consistently and strongly associated with the dependent variables; BP was significantly associated with LVMI and LVH, as well as changes in left ventricular filling.

Conclusion: As expected, a significant association was found between the prevalence of CHD and symptomatic or asymptomatic cardiac structural and functional changes and the presence of the metabolic syndrome. However, defining this syndrome by the number of factors disregards the differential contribution factors for cardiac phenotypes.

016 HEART FAILURE SYMPTOMS AND PRESERVED SYSTOLIC FUNCTION: MISDIAGNOSIS OR DIASTOLIC DYSFUNCTION?

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Introduction: The diagnosis of heart failure (HF) in routine clinical practice is unreliable, mainly due to the low specificity of symptoms. The goal of this study was to assess how often symptoms suggesting HF in the absence of left ventricular systolic dysfunction are attributable to diastolic HF and how often alternative causes can be identified.

Methods: We designed a cross sectional study with the main goal of determining the prevalence of HF in a community sample of adults living in Porto. Participants were asked about symptoms suggesting HF, and a clinical examination, ECG, spirometry, and echocardiogram were performed. Seven hundred participants have been evaluated in this ongoing study (280 men and 420 women, aged 69.5 (SD 11.8) years). Personal history of coronary heart disease (CHD) was defined as previous myocardial infarction or angina according to self reported information, Rose's questionnaire, and/or pathological Q waves on ECG. Obesity was defined as body mass index ⩾30 kg/m^{2}. Exertion dyspnea was attributed to HF in the presence of left ventricular systolic dysfunction, moderate–severe valvular disease on echocardiogram, or atrial fibrillation. In participants without any of these abnormalities, symptoms were attributed to lung disease if there were moderate to severe obstructive or restrictive changes on spirometry. In the absence of HF and lung disease as defined, symptoms were attributed to obesity or CHD. The characteristics of symptomatic participants in which none of these diseases was identified were compared with those of each of the previously defined groups as well as those of the asymptomatic.

Results: Overall 250 (35.7%) participants declared exertion dyspnea and/or tiredness, leading to mild–moderate functional limitation. In 24 (9.6% of symptomatic subjects) these symptoms were attributable to HF; in 101 (40.4%) to lung disease, in 47 (18.8%) to obesity, and 14 (5.6%) to CHD without systolic dysfunction. Only 64 symptomatic subjects were left and the clinical, analytical, and echocardiographic characteristics (including parameters of transmitral flow to study patterns of left ventricular filling) of these were in general more similar to those of the asymptomatic than any of the other groups.

Conclusion: In most participants who reported symptoms compatible with HF on the questionnaire but who did not have systolic dysfunction, valvular disease or atrial fibrillation, it was possible to identify alternative explanations for those symptoms. Therefore, before attributing them to diastolic HF, it is mandatory to search for these alternatives causes and as far as possible correct them.

017 THE PREVALENCE OF HEART FAILURE IN PORTO— A POPULATION BASED STUDY

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Introduction: Heart failure (HF) is a clinical syndrome that represents the end stage of many different cardiac diseases and noxious insults. It is responsible for a huge burden of morbidity, mortality, costs with treatment and hospitalisations, and poor quality of life. A quantitative perspective of heart failure in our community would be shortsighted if the prevalence of clinically overt HF alone was measured. The objective of

this study was to measure the prevalence of the different stages of cardiac dysfunction, taking into account the progression from high risk, through asymptomatic cardiac abnormalities up to the development of symptoms of HF associated with objective evidence of cardiac disease.

Methods: Population based cross sectional study. Recruitment of participants by random digit dialling for attending a clinical interview at the University of Porto Medical School Department of Epidemiology from January 2001 to December 2003. Individuals aged over 45 years were eligible. Over sampling of individuals aged over 60 years was performed during the last year of the study. Structured clinical interview, ECG, echocardiogram, spirometry, and venous blood sampling collected data. Participants were classified according to the stages defined in the latest guidelines of the American College of Cardiology/American Heart Association (ACC/AHA) for the management of HF: Stage A: high risk of developing HF, with no identified structural or functional cardiac abnormalities and no signs or symptoms of HF (for example, systemic hypertension, coronary heart disease, diabetes mellitus); stage B: structural heart disease that is strongly associated with the development of HF but which has never shown signs or symptoms of HF (for example, left ventricular hypertrophy or fibrosis, left ventricular dilatation or hypocontractility, asymptomatic valvular heart disease, previous myocardial infarction); stage C: symptoms of HF associated with underlying structural heart disease; and stage D: advanced structural heart disease and marked symptoms of HF at rest despite maximal medical therapy. We have studied 700 participants: 420 women (age (mean SD) 68.8 (11.5) years) and 280 men (age 70.6 (12.2) years).

Results: The prevalence (95% CI) of ACC/AHA stages was similar in men and women: low risk: 27.0% (23.7 to 30.4); stage A: 45.4% (41.7 to 49.2); stage B: 23.3% (20.2 to 26.6); stage C: 4.3% (2.9 to 6.1); and stage D: 0% (0 to 0.5). The prevalence of left ventricular systolic dysfunction and valvular heart disease was larger in men than in women, while the prevalence of left ventricular hypertrophy was larger in women. The prevalence of stages B and C increased with age in both sexes.

Conclusion: In this community sample of older adults, there was a large prevalence of cardiac disease, largely asymptomatic. Taking into account the progressive nature of the disease, the proportion of participants at high risk of developing heart failure is worrisome and warrants intervention.

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018 **THE SOBRAL SURVEY ON HEALTH, EDUCATION AND QUALITY OF LIFE OF CHILDREN AGED 5 TO 9 YEARS IN URBAN SETTINGS OF SOBRAL, CEARA, BRAZIL, 1999–2000: REFERRED MORBIDITY ANALYSIS**

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Introduction: Children between 5 and 9 years of age have not been subjects of population morbidity studies. The available research results focus on specific groups, such as children at school or the ones assisted by the health services, which poses limits on generalising those results. This study aimed to analyse the referred morbidity among children aged 5 to 9 years.

Methods: A cross sectional study was designed to interview mothers, preferably, or another adult at home. A stratified probability sample, by year of birth (from 1990 to 1994) allowed the selection of 3444 children, aged 5 to 9 years, from a dataset of all families with children in this age, living in the urban area of the city. These data were originated from an official form of the city's Family Health Program (PSF), filled out by the community health workers. Only one child per home was allowed to enter the study randomly. From the total sample, a sub-sample of children was randomly selected for clinic and laboratory exams. Data were collected from November 1999 to October 2000, by trained interviewers, using a pre-tested semi-structured questionnaire. Sickness in the previous 15 days, search for health assistance during those 15 days, hospitalisation, dentistry treatment in the previous 12 months, and the use of medication in the previous 3 days were the requested information on morbidity.

Results: The presented results are those obtained by household interviews. Almost half of the mothers (43.9%) mentioned that their children had some kind of health problem in the previous 15 days. The most frequent complaints concerned upper respiratory illnesses (63.7%),

skin problems (7.5%), asthma (4.2%), and recurrent pain (3.6%). Less than half (41.2%) of the interviewed mothers with sick children had looked for medical assistance; 5.4% stated that their children had been hospitalised in the previous 12 months, 27.6% being due to lower respiratory diseases, 20.8% because of accidents, and 18.2% as a consequence of gastrointestinal diseases. 51% of the mothers had taken their children to dental treatments during the previous 12 months, 16.5% of the children had been under medication in the previous 3 days.

Conclusion: The amount of children with health problems in the previous 15 days was extremely high considering their age. Nevertheless most of them were mild diseases that, even though, required health care. Studies of this kind are fundamental for the planning of adequate health actions destined to children of this age group.

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019 **COMPARISON OF TWO DEFINITIONS OF SMALL SIZE AT BIRTH IN RELATION TO MOTOR DEVELOPMENT AT 6 MONTHS**

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Introduction: Dichotomising a measure such as birth weight involves loss of information, but it is required when the aim is making decisions about intervention or monitoring of babies. Estimating the expected birth weight for a baby based on the birth weight of its older sibling may offer an interesting alternative approach compared with using gestational age specific birth weight, for identifying high risk babies.

Methods: For 10 577 second babies born to women enrolled in the Danish National Birth Cohort we calculated the expected birth weight based on the method proposed by Skjaerven and colleagues.[1] We then calculated a birth weight ratio (birth weight/birth weight predicted from older sibling). We identified the lowest 10% and compared this with the lowest 10% of the sex and gestational age specific distribution, estimated by using a z score using standards from Norway (SGA). We examined whether selected predictors of birth weight influenced the classification of the baby as small or normal according to the two criteria. On a sub-sample of xxxx babies whose mothers responded to an interview about 6 moths after birth, we examined how these categories predicted motor development.

Results: The two criteria identified 1058 and 1059 babies, respectively, but only 738 overlapped. Babies who were classified as small for gestation but were normal according to the birth weight ratio were more often born to short or thin mothers. The birth weight ratio predicted babies with a delayed motor development as well as the definition of small for gestational age. The group of babies weighing on average 3252 g that was classified as small by the birth weight ratio because babies fell short of their predicted birth weight by about 550 g had an OR of delayed motor development of 1.45 (95% CI 1.06 to 1.96) compared to babies classified as normal by both criteria.

Conclusions: Our results suggest that the birth weight ratio could be a useful addition to the z score in identifying babies at risk. The former method is less likely to classify as small babies based upon their mother's size. It identifies, on the other hand, babies who grew smaller than their older siblings without being small in absolute terms.

1. **Skjærven R**, Gjessing HK, Bakketeig LS. New standards for birth weight by gestational age using family data. *Am J Obstet Gynecol* 2000;**183**:689–96.

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020 **SELF MANAGEMENT AND THERAPY ADHERENCE IN TYPE 2 DIABETICS: EFFECT OF WIFE INVOLVEMENT IN THE EDUCATIONAL PROGRAMME**

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Introduction: Diabetes is a major public health issue. Its frequency is increasing and it is responsible for high mortality and large amounts of potential years of life lost. Diabetics' education is essential to promote self care activities and adherence to adequate preventive guidelines. The involvement of the partner might play an important role in the diabetic care plan, but few studies addresses the issue under controlled conditions. We designed a randomised controlled trial to determine the effect of partner involvement in the educational program for the diabetic type 2, in to adherence to treatment and metabolic control.

Setting: A primary health care centre.

Methods: Between April and October of 2003, 103 male participants, previously diagnosed with type 2 diabetes, married and without

accentuated dependence in self care activities, were approached and accepted to be randomised into two groups. The intervention involved the presence of the partner, and both groups received an educational programme consisting of one month on self care activities as nutrition, physical exercise, foot care, and medication and monitoring of blood glucose, promoting adherence and behaviour changes. The Summary of Diabetes Self-Care Activities Measure – SDSCA scale was used to evaluate adherence, and the Diabetes Knowledge Questionnaire – 24 was used to evaluate knowledge. Both scales were translated and adapted for the Portuguese population. Paired and unpaired differences were compared using non-parametric tests.

Results: Comparing adherence scores at baseline and after 2 months, a significant improvement in both groups for almost every component of self care was observed. The difference was larger in the intervention group though only statistically significant for exercise and medication. The group with wife presence had a significant higher improvement (exercise mean differences: 3.1 CI 95% 2.2 to 3.7 v 1.9 CI 95% 1.1 to 2.2 days a week, p = 0.017, and medication 1.0 CI 95% 0.2 to 1.6 v 0.0 CI 95% -0.5 to 0.5 days a week, p = 0.016. The total score adherence difference was higher and statistically significant in the intervention group (means difference: 1.8/1.1 CI 95% 1.5 to 2.1/0.9 to 1.5 days a week, p<0.001). The basic 2 months programme significantly increased patient knowledge about diabetes, but no further effect was found for the presence of the partner (mean difference 21.0%/22.2% CI 95% 17.9 to 24.2/17.8 to 26.5, p<0.667). Significantly, decreases in diastolic blood pressure and waist circumference and a significant increase in number of blood glucose test performed were observed within but not between groups, despite better results in the intervention group. There were no significant changes in glucose control, although improvements in HbA1c were found.

Conclusions: The partner presence in the diabetic educational programme improved the partners' adherence to physical exercise and medication intake.

021 INDOOR RADON EXPOSURE AND RISK OF LUNG CANCER: A CASE CONTROL STUDY IN FRANCE

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Introduction: It is well established that exposure to the radioactive gas radon increases risk of lung cancer among uranium miners. To estimate the lung cancer risk linked to indoor radon exposure, a hospital based case control study was carried out in France, with a focus on precise reconstruction of past indoor radon exposure over the 30 years preceding the lung cancer diagnosis.

Methods: The study was conducted from 1992 to 1998 in four radon prone areas of France. During face to face interviews, a standardised questionnaire was used to ascertain demographic characteristics, information on active and passive smoking, occupational exposure, medical history as well as extensive details on residential history. Radon concentrations were measured in the dwellings where subjects had lived at least 1 year during the 5–30 year period before interview. Measurements of radon concentrations were performed during a 6 month period, using two Kodalpha LR 115 detectors, one in the living room and one in the bedroom. The time weighted average (TWA) radon concentration for a subject during the 5–30 year period before interview was based on radon concentrations over all addresses occupied by the subject weighted by the number of years spent at each address. For the time intervals without available measurements, the region specific arithmetic average of radon concentrations for measured addresses of control subjects was used.

Results: A total of 486 cases and 984 controls with at least one dwelling measured were included in the study. After imputation for missing values, the arithmetic mean of the TWA radon concentration experienced by cases during the previous 5–30 years was 146 Bq/m^3, while the value for controls was 140 Bq/m^3. The relative risks of lung cancer (with 95% CIs in parentheses) in relation to categories of TWA radon concentrations delimited by cut points at 50, 100, 200, and ≥400 Bq/m^3 were: 0.85 (0.59 to 1.22), 1.19 (0.81 to 1.77), 1.04 (0.64 to 1.67), 1.11 (0.59 to 2.09), respectively, with TWA radon concentrations below 50 Bq/m^3 used as reference category and with adjustment for age, sex, region, cigarette smoking, and occupational exposure. The relative risk of lung cancer increased by 0.04 (−0.01 to 0.11) per 100 Bq/m^3 increase in the TWA radon concentration cumulated over the 5–30 year period before interview. When the analysis was limited to the 257 cases and 593 controls with complete measurements for the 25 years, the corresponding increase was somewhat higher at 0.07 (0.00 to 0.14) per 100 Bq/m^3.

Conclusion: Our results indicate a small increase in lung cancer risk, at the borderline of statistical significance, as a result of indoor radon exposure; which is consistent with the findings of previous indoor radon and miners' studies. Our data are integrated in the pooled analysis of several European case control studies.

022 ORIGINAL APPROACH TO THE INDIVIDUAL CHARACTERISTICS ASSOCIATED WITH FORGONE HEALTHCARE: A STUDY ON PEOPLE WHO LIVED ON INCOME WELFARE IN 2000, FRANCE, 2003

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Introduction: The social inequalities in health have endured or even relatively worsened throughout different social groups since the 1990s. In France, universal access to healthcare is theoretically guaranteed through the Social Security system. Nevertheless, in 2002, 11.2% of the French population stated that they had forgone healthcare because they could not afford it during the year preceding the survey. Our objective was to determine which individual psychosocial characteristics (in addition to the socioeconomic ones and health status) were associated with the fact of stating (or not) that healthcare had been forgone because of cost.

Method: 2000 individuals who lived on income welfare in 2000 were enrolled in a cross sectional representative study in January 2003 in France. Statistical associations between such a renouncement and psychosocial characteristics were examined using logistic regression models adjusted on age, sex, income level, health insurance status, and health indicators. Pearson χ^2 and deviance estimate were used to assess the goodness of fit of our model, and bootstrap methods to validate this model.

Results: After adjustment, we observed a higher occurrence of reported forgone healthcare among people who have lost the income welfare at the time of the study, who perceived their financial situation as bad and who have limited knowledge about existing assistance policies. Such a renouncement is also associated with some items of the Rosenberg self esteem (for example, ''I am able to do things as well as most other people''; ''I feel I do not have much to be proud of'').

Conclusions: There results show that other than purely financial hurdles play a role in the non-utilisation of health care services in this population. Health policies, which mainly promote equal financial access to healthcare, have little chance of abating health inequalities.

023 MODELLING INFANT MORTALITY: A COMPARISON OF THREE METHODS TO MODEL NON-PROPORTIONAL HAZARDS

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A common problem in survival analysis is to estimate the effect of co-variables on the hazard function for which the proportional hazards model is often used. We compare three methods to model a time dependent effect of a binary risk factor on survival in the context of a proportional hazards model. The simplest option is a stepwise constant modelling of the hazard ratio, which, however, yields a step function, which biologically may not be plausible. In addition, the choice of the cut points is arbitrary and may lead to wrong conclusions. The adaptive hazard regression (HARE) methodology circumvents the need to assume proportional hazards and allows time dependent effects of covariates. HARE models these effects through the use of polynomial splines. A third, new method is based on fractional polynomials, which have been used to model the effect of continuous co-variables on the outcome parameter in various regression models. Here, the co-variable enters the model as a time dependent co-variable $f(x, b, z) = b\_0 + b\_1 * z\_1 (t) + \ldots b\_k * z\_k (t)$, where zj is among the set of functions used for fractional polynomials.

We illustrate the methods using data of 11 312 children from Burkina Faso where we analyse the mortality of twins in comparison to singles. Here, the risk of dying for a twin is strongly increased in comparison to a singleton in the first weeks after birth and gradually decreases. We compare the goodness of the three model fits by use of the integrated Brier score modified to account for the predicted survival of twins and give recommendations on practical procedures.

024 SOCIOECONOMIC STATUS PROFOUNDLY INFLUENCES RHEUMATOID ARTHRITIS CLINICAL STATUS AND OUTCOME: A COMPARISON OF PORTUGUESE AND US PATIENTS

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Introduction: Recent European studies of rheumatoid arthritis (RA) status and outcomes have demonstrated substantial differences between countries,[1] suggesting that treatment effects might account for the differences. However, these studies did not collect data on key socioeconomic variables, which are known to influence RA status and outcome. Although Portuguese RA patients have treatment options that are similar to those in other countries, the average education level in Portugal in 2000 was 5.9 years the lowest in Europe. We took advantage of this characteristic to study the effect of socioeconomic status on RA.

Objectives: To determine the extent to which socioeconomic status determines RA status and outcome.

Methods: As part of a longitudinal study of the outcome of RA in Portugal, 94 patients completed a comprehensive assessment of RA in 2003. Questionnaires were administered by trained assessors for patients with inadequate literacy. For comparison, the same questionnaire was administered to 9609 RA patients in the US. In the first stage of comparisons, the US RA cohort was compared to the Portuguese. In the second stage of comparison, a random sample of 94 US patients matched exactly as to educational level was obtained and used as the comparison group. Results of the second stage were adjusted further for age, sex, RA duration, and total household income.

Results: The groups differed strikingly for the key socioeconomic variables (US v Portugal): age (62.4 v 53.8 years), education level (13.7 v 5.4 years), RA duration (17.0 v 11.9 years), and total household income (€47 400 v €8400). In the unadjusted analyses of the table, Portuguese patients had much worse scores than US patients. For example, the health assessment questionnaire disability index (HAQ) was 0.51 units greater and quality of life utility scores (EuroQol utility) were 0.29 units lower. In addition depression and the SF-36 mental component scale (MCS) scores were strikingly different. Adjustment for socioeconomic status (SES) resulted in scores that were approximately equal in the two countries with the exception of depression and SF-36 MCS scores.

Abstract 24

Variable	US (unadjusted)	Portugal (unadjusted)	US (adjusted for SES)	Portugal (adjusted for SES)
HAQ	0.98	1.49*	1.38	1.42
Pain	3.4	5.4*	4.8	4.8
Patient global	3.2	5.7*	4.7	5.4
Fatigue	4.1	4.6*	5.2	4.3
Depression	2.1	5.0*	3.2	4.7*
SF-36 PCS	33.2	30.0*	27.9	30.9
SF-36 MCS	46.0	28.1*	35.7	31.0*
EuroQol utility	0.65	0.36*	0.48	0.46

*Significantly different at 0.05 level.

Conclusion: Almost all of the clinical differences between Portuguese and US patients can be explained by SES. For the key RA status and outcome variables (HAQ, pain, global, fatigue, utility, and PCS, there are no differences between countries following adjustment for SES. Depression and MCS, however, remained lower in Portugal. SES profoundly influences RA clinic status. A strong case is made for collection of such data in clinical trials and observational studies

1. **Antoni C**, Smolen J, et al. Results from a crossectional survey (cooperative on quality of life in rheumatic diseases) showed a remarkably high mean HAQ 1.14 despite DMARD therapy in european RA patients. Orlando, Florida: American College of Rheumatology, 2003.

025 HANDEDNESS AND ABILITY

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Introduction: Handedness is a unique, uniform and universal characteristic of the human being. Differences between left-handers, right-handers and ambidextrous individuals always raised great interest and have been the centre of multiple discussions within the scientific community. The aim of this study was to assess whether there is a relation between handedness and several cognitive abilities (social sciences, exact sciences, arts, music) and motor abilities (sports) among students of the University of Porto.

Methods: We approached unselected students in 10 faculties of the University of Porto to participate in a cross sectional study on handedness and abilities. Data were collected by an anonymous questionnaire. Handedness was defined according to current hand preference for writing and hand preference for general activities. Participants were considered right-handed if they considered themselves right-handed and reported writing with the right hand; left-handed if they considered themselves left-handed and wrote with the left hand; and ambidextrous if self-percepted as ambidextrous and reported to write indifferently with any hand. Participants whose answers to these questions were contradictory were excluded. Among 4499 students that agreed to participate, only 3966 were included in the present analysis due to missing data in key variables or contradictory answers on handedness. We report prevalences and their 95% CI and used the χ^2 test to compare proportions.

Results: The prevalence of right-handedness was 93.5% (95% CI 92.7 to 94.3); 5.7% (5.0 to 6.5) of participants were left-handers and 0.8% (0.5 to 1.1) ambidextrous. Right-handers had a self reported higher ability for exact sciences (p = 0.008) and ambidextrous individuals for social sciences (p = 0.009). There was no statistically significant association between handedness and arts, music, or sports. Men were more frequently left-handed (6.4% v 5.1% in women), although the difference did not reach statistical significance (p = 0.23). Men had a significantly higher ability for exact sciences and sports, and women had a significantly higher ability for social sciences and arts; there was no significant difference between sexes in ability for music.

Conclusions: There was an association between handedness and exact sciences, for which right-handers have higher ability, and between handedness and social sciences, for which ambidextrous have higher ability. Previous empiric impressions on the association between left-handedness and arts were not confirmed by our study, as well as relationships between handedness and music or sports.

026 MANIPULATIVE THERAPY FOR PATIENTS WITH SHOULDER COMPLAINTS: RESULTS OF A RANDOMISED CONTROLLED TRIAL

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Introduction: A dysfunction of the cervicothoracic spine and the adjacent ribs (shoulder girdle) is considered to be a predictor for occurrence and poor outcome of shoulder complaints. It can be treated by manipulative therapy, but scientific evidence for its effectiveness is lacking. The objective of the present study is to evaluate the effectiveness of manipulative therapy of the shoulder girdle, additional to usual care, on relief of shoulder complaints.

Methods: In this randomised controlled trial, 150 patients with shoulder complaints and a dysfunction of the shoulder girdle were recruited in 50 general practices in Groningen, The Netherlands. All patients received usual care according to the Dutch Guidelines for General Practitioners and were evenly randomly allocated to manipulative therapy (up to 6 treatment sessions in a 12 week period). Main outcome measures included perceived recovery, severity of main complaint, shoulder pain, shoulder disability, and general health. Data were collected at 6 and 12 weeks after randomisation.

Results: During treatment (6 weeks) no significant differences were found. After completion of treatment (12 weeks), 43% of the patients receiving additional manipulative therapy reported full recovery, and 24% in control group (95%CI 3.7% to 34.5%). At 12 weeks the difference in mean severity of main complaint (d = 1.0; CI 0.0 to 1.8) and shoulder pain (d = 1.9; CI 0.3 to 3.5) favoured manipulative therapy. Also, the difference in mean shoulder disability and general health favoured manipulative therapy, but was not statistically significant.

Conclusions: Manipulative therapy of the shoulder girdle, additional to usual care by the general practitioner, improves recovery and reduces symptoms of shoulder complaints at 12 weeks. Currently, long term data on clinical and cost effectiveness are collected.

027 TRENDS OF CERVICAL CANCER MORTALITY IN THE STATE OF PARANÁ, SOUTHERN BRAZIL, 1980–2000

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Introduction: An improved socioeconomic profile and access to health services are critical issues to a reduced incidence of cervical cancer, early diagnosis, and prolonged survival of patients. The objective of the current study was to describe trends of cervical cancer mortality in the state of Paraná, Brazil, from 1980 to 2000, and to assess socioeconomic conditions associated with a poorer evolution of deaths.

Methods: The Official System for Information on Mortality supplied data related to cervical cancer deaths, as discriminated by age and town of residence. Age adjusted death rates were calculated for 22 regions of the state in each year. The appraisal of trends used the Cochrane-Orcutt procedure of auto regression for time series analysis and estimation of the annual per cent increase of mortality. Population data and socioeconomic information at region level were gathered from censuses performed in 1980, 1991, 1996, and 2000. Comparative analysis assessed socioeconomic indices associated with regions presenting stationary and increasing trend of cervical cancer mortality.

Results: Cervical cancer deaths were on the increase in the state of Paraná, with an annual percent increase of 1.68% (95% CI 1.20% to 2.17%). Despite the overall increase of rates, most regions presented stationary trend. Only three regions presented increasing trend of mortality: Guarapuava, Campo Mourão, and Cornélio Procópio. The comparison of regions presenting increasing and stationary trend indicated poorer socioeconomic indices for the former set, and regions with increasing levels of cervical cancer mortality had significantly higher illiteracy rate ($p < 0.001$), percent of individuals older than 15 years with less than 4 years of study ($p = 0.001$), and lower per capita income ($p = 0.025$) and human development index ($p = 0.023$).

Conclusion: The ecologic assessment of information on cervical cancer suggests that poorer socioeconomic standings of population contributed to a worse evolution of mortality. The quantitative assessment of this association in the Brazilian context may instruct health services aimed at prevention and treatment of the disease and help them target intervention programmes.

028 ARE THE RESULTS OF CERVICAL CANCER PATIENTS TREATMENT IN POLAND REALLY THE LOWEST IN EUROPE?

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Introduction: The 5 year survival rate for cervical cancer patients in Poland was evaluated in two cities; Warsaw and Krakow were 48%, which is rather low compared with other European countries. The mortality of cervical cancer varies considerably, mainly due to different access to prevention programmes and treatment. Consequently, differences in survivals should be expected. The aim of the study was to evaluate whether cervical cancer patients living in selected regions of Poland show similar treatment results.

Methods: The cohort was constituted on all the data about cervical cancer incidence in years 1990–96 obtained from the population's Cancer Registries, collecting data from Kieleckie (K), Opolskie (O), voivodships, and Warsaw city (W). The prognostic factors were made complete by adding information from medical records. The follow up of patients lasted 5 years. SAS was used for the analysis. The 5 year relative survival rates were calculated using life tables method modified by Hakulinen.

Results: The cohort consisted of 1386 women whose average age was 56. The FIGO stage distribution was: I 30%, II 29%, III 23%, IV 9%, and unknown 9%. The squamous cell carcinoma represented 85%, adeno-carcinoma 8%. The 5 year relative survival rate for all patients was 52%; according to FIGO: I 84, II 50, III 26, and IV 8. The regions were similar in age group distribution and histological diagnosis, differentiated, however, in FIGO distribution ($p < 0.0001$), which was as follows I: K 41%, O 25%, W 28%; II: K 20%, O 32%, W 33%; III: K-17%, O 18%, W 29%; IV: K 10%, O 10%, W 6%; and unknown: K 11%, O 15%, W 4%. The 5 year survival rates were 61% in Kieleckie and were close to European average in Opolskie 43 and in Warsaw 52. The survival for FIGO I in those regions was comparable, but different for FIGO II and III.

Multivariant analysis showed significant risk increase related to stage advancement ($p < 0.0001$) as well as the place of living in Opolskie ($p = 0.02$) and adenocarcinoma diagnosis ($p = 0.05$). However, the analysis did not confirm the age of diagnosis as prognostic factor. A relatively high proportion of early stages of the disease in Kieleckie seem to be related to a prevention programme carried out there in 1982–88. Insufficient diagnosis and radiotherapy protocol applied in Opole town hospital at that time occurred in unsatisfactory treatment results in Opolskie.

Conclusions: The cervical cancer treatment results are differentiated in Poland. They are almost satisfactory and close to European average in Kieleckie where prevention was effective, but poor in the regions where prevention was insufficient. In all stages survivals were relatively high and close to clinical series in European hospitals. However, the most crucial discrepancies were in FIGO II showing the local problems in diagnosis and radiotherapy. The poor survivals mainly depend on unsatisfactory proportion of early stages, which should be immediately improved by the implementation of national prevention project.

029 MULTIPLE BIRTHS IN THE EUROPEAN COMMUNITY: DIFFERENCES IN THE ONSET OF LABOUR AND PREGNANCY OUTCOME

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Introduction: The rise in multiple birth rates in developed countries over the past 25 years has been described as an epidemic. Increasing maternal age at childbirth and, more importantly, the use of ovarian stimulation and assisted conception explain the rise in multiple birth rates. This trend is of concern because of the high mortality among multiples, due principally to higher preterm delivery rates. Moreover, in some countries, preterm delivery rates have risen among twins, probably because of increasingly active management at the end of pregnancy. We compared the multiple birth rates, the rate of preterm delivery, and the management of the onset of labour in a number of European countries, in order to show the implications of these general trends for perinatal outcome in each country.

Method: We used aggregated data collected by the PERISTAT project, a project to develop health indicators for the European Union. Data were available for Austria, Flanders, and the French community in Belgium, Denmark, Finland, France, Germany (9 Bundesländer), Italy, Netherlands, Portugal, Sweden, and Scotland, and Northern Ireland in the UK. In most countries data were for the year 2000. The main measures were the multiple delivery rates per 1000 deliveries, the proportion of live births before 37 weeks, and the proportion of preterm births after induction or elective caesarean section.

Results: The proportion of multiple deliveries ranged from 11.4 per 1000 in Portugal to 19.4 per 1000 in The Netherlands. There was no clear tendency towards a higher rate of multiple births in the countries in which a high proportion of deliveries are to women aged 30 years or more. Data on ovarian stimulation and assisted conception were very limited and could not be used to explain variations in the multiple delivery rates. In all countries with data, more than 40% of multiple live births occurred before term. The highest proportions were 56% in Belgium and 68% in Austria. The relative risk of preterm birth for multiples compared with singletons varied between 8.1 and 10.5. The percentage of preterm live multiples delivered after induction or by elective caesarean section was known in nine countries and ranged from 26% in Finland to 50% in Germany. The countries that had the highest preterm delivery rates also had the highest proportion of labours without spontaneous onset.

Conclusion: The wide variations in the rate of multiple deliveries and the ways in which these deliveries are managed raise questions about differences in obstetric practice. Better knowledge of the impact of these practices on immediate and long term health of babies from multiple births and their mothers would be useful.

030 ALCOHOL CONSUMPTION AND ALL CAUSE MOR-TALITY IN RUSSIAN MEN AND WOMEN: A COHORT STUDY BASED ON THE MORTALITY OF RELATIVES

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Introduction: Alcohol and binge drinking have been suspected of adverse effects on mortality in Russia but individual level data are

sparse. Using modified indirect demographic estimation techniques, we examined the relationships between frequency of alcohol consumption and of binge drinking and adult mortality in Russia.

Methods: A convenience cohort was constructed based on survey respondents' information about their close relatives. A random sample of 7172 respondents (response rate 61%) selected from the general population of the Russian Federation provided information on 10 475 male and 3129 female relatives, including age, vital status, and frequency of alcohol consumption and binge drinking. These relatives formed the cohort analysed in this report. The relation between all cause mortality and frequency of any drinking and binge drinking was estimated by Cox regression.

Results: There was a strong linear relationship between frequency of drinking and all cause mortality in men; after controlling for smoking and calendar period of birth, the hazard ratio of death in daily drinkers compared with occasional drinkers was 1.52 (95% CI 1.33 to 1.75). Male binge drinkers had slightly higher mortality than drinkers who did not binge (adjusted HR 1.21, 1.12 to 1.31). In women, the increased mortality was confined to a small group of those who binged at least once a month (adjusted hazard ratio 2.68, 1.54 to 4.66).

Conclusions: The results suggest a positive association between alcohol and mortality in Russia. There was no evidence for the protective effect of drinking seen in Western populations. Alcohol appears to have contributed to the high long term mortality rates in Russian men but it is unlikely to be a major cause of female mortality.

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031 DISPARITY BETWEEN NOTIFIABLE INFECTIOUS DISEASE HOSPITALISATIONS AND NOTIFICATIONS FROM A HEALTH BOARD REGION IN IRELAND: A CAUSE FOR CONCERN?

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Introduction: The notifiable infectious disease process is essential for prompt public health action and for the monitoring of real time disease incidence in the Irish population. However, anecdotal evidence suggests that the occurrence of notifiable infectious diseases is seriously underestimated. The aim of this study therefore was to address this question by quantifying the burden of notifiable infectious diseases on inpatient hospital admissions from 1997 to 2002 from a health board region in Ireland and comparing the results to the corresponding statutory notifications.

Methods: All hospital inpatient admissions from 1997 to 2002 with a principal diagnosis relating to infectious diseases (ICD codes 001–139) by residents from this health board region were extracted from the Hospital In-Patient Enquiry System (HIPE). All notifiable infectious diseases were identified based on the 1981 Irish Infectious Disease Regulations and the data were analysed in JMP statistical package. These data were compared with the corresponding notification data. This health board services the needs of a population of 344 926 (based on the 2002 census) and has five acute hospitals.

Results: Analysis of the HIPE data from 1997 to 2002 revealed a substantial burden associated with notifiable infectious diseases. There were 2759 hospitalisations by 2455 residents, 17 035 bed days taken up and 31 fatalities. The most common notifiable disease hospitalisations were for gastroenteritis in children less than two (28.3%), viral meningitis (11.1%), and TB (10.4%). Overall, these hospitalisations represented 31.3% of all infectious disease hospitalisations and 0.94% of total hospitalisations. The statutory notifications, however, comprise both GP and hospital clinician notifications. Therefore, only in cases where there are more hospitalisations than notifications can underreporting be accurately identified. This occurred in 10 out of 23 notifiable diseases, for example acute encephalitis (35 hospitalised *v* 2 notifications); infectious mononucleosis (224 hospitalised *v* 70 notified); malaria (23 hospitalised *v* 4 notifications); leptospirosis (9 hospitalised *v* 3 notifications), and viral meningitis (299 hospitalised *v* 42 notifications). It is notable that the second most common hospitalisation (viral meningitis) was underreported by 257 cases.

Conclusion: This study has highlighted the extent of underreporting of some notifiable infectious diseases, which is a cause for concern from a surveillance point of view. If this underreporting is similar in other health boards in Ireland, then it would appear that the epidemiology of some notifiable diseases is being overlooked and this negatively impacts on the effectiveness of the notification process as a real time surveillance tool and an early warning system for outbreaks. Furthermore, on 1 January 2004 Ireland introduced new legislation, which includes microbiology laboratories as notifiers, hence studies like this will provide

a baseline for comparing the effectiveness of the new reporting system into the future.

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032 EPIDEMIOLOGICAL SURVEILLANCE, DISEASE MAPPING, AND DETECTION OF SPATIAL PATTERNS IN BRAZIL

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Introduction: The main objective of epidemiologic surveillance of disease is detecting its time and space variation. However, mapping crude incidence rate is not appropriate to produce accurate risk estimates. A relied identification of the spatial distribution pattern of the events under surveillance can generate ecological causal hypotheses that are useful to improve their control.

Objectives: (1) producing choropleth maps of crude and adjusted morbidity rates of selected diseases, comparing their spatial distribution in the municipalities of the states of Brazilian Northeast Region (BNR) in the period of 1999–2002; (2) detecting spatial autocorrelation in order to identify morbidity risk areas.

Methods: We studied three infectious diseases under surveillance in Brazil: dengue (ICD-10th, A90), tuberculosis (ICD-10th, A15-A19), and visceral leishmaniasis (ICD-10th, B55.0). Morbidity data were obtained from the Brazilian National Morbidity Information System (SINAN) and population data were obtained from the Brazilian Population Census Bureau (IBGE). We calculated rates for the period studied and Freeman-Tukey transformation and empirical Bayes were also performed in order to reduce the data excessive variability and possible spatial outliers' identification. We investigate spatial autocorrelation using Moran's I and Geary's C statistics and local spatial autocorrelation using LISA and Moran scatter plot maps. Spatial weights matrices were constructed using adjacency as neighbourhood criteria.

Results: We found three distinct spatial patterns for the surveillance diseases studied. The evidence of spatial pattern was found only when transformed rate were used. Global and local spatial autocorrelation were found for the incidence data. Dengue, tuberculosis, and visceral leishmaniasis had statistically significant Global Moran's I values of 0.701, 0.517, 0.644, respectively. LISA maps showed the evidence high risk zones when the three diseases were analysed.

Conclusions: We conclude that dengue, tuberculosis, and visceral leishmaniasis were not spatially randomly distributed in Brazilian Northeast Region in the period studied.

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033 PREVALENCE, CAUSES, AND HEALTH EFFECTS OF DAMPNESS AND MOULD IN HOMES

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Introduction: Dampness and mould growth in homes are associated with an increased risk of allergic and respiratory disease. With the aim of obtaining a representative overview of the situation in German homes and analysing the causes and factors affecting the development of signs of dampness and mould growth, a random sample of 5530 homes was investigated.

Methods: The investigation includes an expert rating of building factors following a standardised protocol and a questioning procedure relating to behaviour in the homes and other aspects of the living environment. In addition, the prevalence of asthma, allergic, and respiratory disease of the 12 132 occupants was surveyed. Statistical software SAS, Release 8.2, was used for calculation of prevalence rates and multiple logistic regression analysis.

Results: There were visible signs of dampness (including mould) in 1213 (21.9 %) of the examined dwellings and mould spots in 513 (9.3%) of them. The risk of dampness was significantly greater for increasing moisture emission indoors (OR 1.8; CI 1.4 to 2.4), inadequate user related ventilation (OR 1.7; CI 1.2 to 2.3), edges or corners of outside walls (OR 1.4; CI 1.2 to 1.7), and rented homes in contrast to owner occupied homes. The existence of a user independent exhaust ventilation system (OR 0.5; CI 0.3 to 0.8) or of chimney ventilation (OR 0.7; CI 0.6 to 0.9) and characteristics of modern state of the art buildings such as sealed windows (OR 0.7; CI 0.6 to 0.8) or thermal insulation (OR 0.9; CI 0.7 to 1.0) as well as an increasing rooms per head index (OR 0.9; CI 0.9 to 1.0) are significant protective factors. With regard to

mould growth the critical factors are, on the whole, similar. Differences are: the importance of indoor moisture sources decreases (OR 1.3; CI 0.9 to 1.9) while a pet in the home increases the risk of mould significantly (OR 1.4; CI 1.2 to 1.8). Socioeconomic variables become more important (for example rented home OR 2.0; CI 1.6 to 2.6). All types of moisture related damage are significantly associated with an increased self reported prevalence of respiratory and allergic diseases.

Conclusions: The results confirm the unfavourable health effect of dampness and mould known from, for example, Scandinavian literature and emphasise the importance of these problems in Germany. They also enable hints for prevention regarding construction and equipment of buildings and behaviour of occupants.

034 ADHERENCE OF PATIENTS WITH AIDS TO TREATMENT WITH HIGHLY ACTIVE ANTIRETROVIRAL THERAPY (HAART): RIO GRANDE DO NORTE, BRAZIL, 1999–2002

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Introduction: The purpose of this study is to determine factors for adherence to antiretroviral treatment in adults with AIDS, living in the State of Rio Grande do Norte, Brazil, who received their first prescription of HAART between January 1999 and December 2001.

Methods: It is based on a population based study. The adherence was calculated using data on the number of kept appointments at pharmacies. A patient was considered to have adhered to the treatment if they turned up for at least 80% of programmed visits to the pharmacy; failure to appear at any programmed visit for a period of 6 months subsequent to the date the medication was prescribed was termed refusal.

Results: The study covered 498 patients, about 52.4% of who had already arrived at the specialised treatment centre with some symptom, signal, or disease indicating immunodeficiency. The overall refusal percentage was 10.4% in the first 6 months following prescription and among pregnant women, this percentage rose to 28.6%. The overall percentage for adherence to antiretroviral therapy was 64.1%. On analysis of the association between adherence and socio demographic and clinical variables, no association was found with the following: sex, type of exposure, place of residence, previous identification of HIV infection, the presence of symptoms at the start of antiretroviral therapy, the level of CD4+ and viral charge, nor with the type of antiretroviral combination prescribed. The level of adherence was lower among young adults, aged between 25 and 34, single people, and in the groups with low levels of education. Clinical factors found to be significantly associated with non-adherence were: a history of psychiatric treatment prior to the diagnosis of AIDS, drug use, and the beginning of antiretroviral treatment during a stay in hospital.

Conclusions: After multivariate analysis, significant associations persist between non-adherence and a hospital stay, the use of legal or illegal drugs, a history of psychiatric treatment, a low level of education and an age of between 25 and 34. It is worth pointing out that the analysis of predictive factors for non-adherence did not show any association between adherence and the type of antiretroviral combination prescribed.

035 CHANGES IN MULTIPLE LIVE BIRTHS AND CEREBRAL PALSY CHILDREN OVER TIME IN EUROPE (1980–1996)

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Introduction: Because multiple births are at a higher risk of cerebral palsy (CP) than singletons it is of great importance to assess the impact of the increasing multiple birth rates on this long term outcome.

Objectives: Through this work we aimed to answer the following: What are the trends over time of the rate of CP in children issuing from multiple births? and have multiples with CP changed over time with regard to their gestational age (GA), birth weight (BW), and clinical features?

Methods: A collaborative network on CP provided data on CP children and denominators for birth years 1980 to 1996. For this work data from nine centres (6 countries) are presented. Trends over time were analysed using three 5 year periods, that is, children born in 1980–1984, 1985–1989, and 1990–1994.

Results: 1) In the areas concerned by the nine CP registers the rate of multiple live birth increased from 1.8% live births in 1980 up to 3% in 1996. A highly significant trend was observed on pooled data (p<0.001), with no interaction. The proportion of multiple live births below 32 weeks varied between centres and years from 2% to 12%, it doubled from 5.6% in the first period to 8.3% in the last period. The same was observed for the GA group 32–36 weeks (from 19.3% up to 35.0%). 2) Overall 499 children with CP were born from multiple pregnancies in these nine centres between 1980 and 1996. Among all CP cases, the proportion of cases from multiple births increased significantly from 7% in the first period up to 11% in the last period (p<0.001). However, the rate of CP in multiples remained remarkably stable over time, 8.1 per 1000 multiple live births, 8.0 and 8.4, respectively, during the first, second, and third periods (p=0.95). Among multiples with CP nearly half were very preterm babies. The proportion of children born below 32 weeks increased from 42% up to 55% but not statistically significant (p=0.17), and a decrease in their mean BW (150 g) as well as in their mean GA (1 week) was observed. These CP children born from multiple presented a predominantly spastic CP type (92%), with 30% of them unable to walk, 25% having a severe intellectual impairment, and 10% a severe visual impairment. This clinical pattern did not change over time.

Conclusions: Despite an increase in the rate of multiple live births, in particular for very preterm multiples, the rate of CP in multiples did not change over time. This probably reflects a balance between improved survival and care management.

036 ADOLESCENT HEALTH SURVEY IN SCHOOL, PHASE ONE A: ASTHMA, PHYSICAL EXERCISE, AND TOBACCO CONSUMPTION

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Introduction: In Portugal there is an ongoing survey about adolescent health in school. The main objective of the survey is to monitor the health strategies and health programmes and to know some determinants of health, like attitudes, behaviours and life styles. The first phase of survey was performed in 2003, and included the health evaluation related to prevalence of asthma, tobacco consumption, and physical exercise.

Methods: We selected a clustering sample with 8928 students from all five health regions in continental Portugal. The data were obtained by a structured self responsiveness questionnaire with 96 questions. The questionnaire was composed by five parts: demographics data, parents' data (professional, occupational situation, level of education, and other data), asthma (wheezing, asthma crisis, nocturne cough, cough and wheezing with exercise, emergency care related to asthma crisis, and drug consumption), physical exercise (in and out of school), and finally about tobacco consumption. The part about asthma was adapted from the ISSAC study questionnaire.

Results: We found a prevalence of 11.3% (95% CI 10.6 to 12.0) for one or more wheezing episode in the past 12 months: males 9.1% (95% CI 9.2 to 10.0) and females 13.1% (95% CI 12.1 to 14.1). By age group the prevalence was 10.7% (95% CI 9.5 to 11.9) at 11–13 years, 10.3% (95% CI 9.3 to 11.3) at 14–16 years and 12.6% (95% CI 12.0 to 13.2) at 17–19 years. The prevalence of daily consumption of tobacco was 11.3% (95% CI 10.6 to 12.0); males 12.0% (95% CI 11.0 to 13.0) and females 10.7 (95% CI 9.8 to 11.6). By age group the prevalence was 1.9% (95% CI 1.4 to 2.4) at 11–13 years, 10.9% (95% CI 18.9 to 20.9) at 14–16 years, and 19.8% (95% CI 18.4 to 21.2) at 17–19 years. 41.2% (95% CI 40.2 to 42.2) of the sample practice physical exercise 1 h or more each day; males 52.4% (95% CI 50.9 to 53.9) and females 30.9% (95% CI 29.6 to 32.2). By age group the practice of 1 h physical exercise or more per day was 41.2% (95% CI 39.3 to 43.1) at 11–13 years, 42.2% (95% CI 40.5 to 43.9) at 14–16 years, and 40.1% (95% CI 38.3 to 41.9) at 17–19 years.

Conclusions: The prevalence of asthma in past 12 months is in the expected rank in comparison with other survey studies in Portugal but higher than the results from the National Health Survey. The one or more wheezing episode in the past 12 months is higher in females than males. The tobacco consumption is very similar in both sex and increases with age. Males practice more intensive physical activity, which is very similar between age groups.

037 ADEQUACY OF ASTHMA TREATMENT TO GINA RECOMMENDATIONS: AN INTERNATIONAL SURVEY, ECRHS II

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Introduction: During the 1990s guidelines for the treatment of asthma have been developed with a step wise increase in treatment for those with more severe symptoms.

Objectives: The aims of this analysis were to determine asthma severity in a Europe wide sample of physician diagnosed asthmatics and to assess the adequacy of their treatment in relation to the GINA guidelines.

Methods: In the European Community Respiratory Health Survey II, 1291 adults with asthma from 28 centres were identified. Asthma severity was assessed using the GINA criteria, which are based both on clinical features and current treatment. A subject was classified as receiving inadequate treatment if current use of drugs was lower than that suggested by the guidelines for the corresponding severity level. A two level logistic random intercept model identified predictors of ''inadequate treatment'', with individuals as 1 level units and centres as 2 level units.

Results: Fifty eight per cent of the patients had intermittent asthma, 10.8% mild persistent, 14.7% moderate persistent, and 16.4% severe persistent. Overall, 28.5% (95% CI 26.0 to 31.1) of all the current asthmatics were receiving inadequate treatment, but in those with persistent asthma this percentage increased to 64.3% (95% CI 60.1 to 68.3). Inadequately treated persistent asthmatics had a higher prevalence of exacerbations (66.9% v 52.3%, p=0.001) than those considered being adequately treated. Subjects owning a peak flow meter (OR 0.55; 95% CI 0.34 to 0.87), compliant with therapy (OR 0.31; 95% CI 0.17 to 0.57) living in Nordic countries (OR 0.50; 95% CI 0.28 to 0.90) and with asthma starting at an earlier age (OR 0.98; 95% CI 0.96 to 0.99) were less likely to be identified as being on ''inadequate treatment''.

Conclusions: Despite dissemination of guidelines, a substantial percentage of asthmatics in Europe are not taking asthma therapy as recommended. This is particularly marked in those with severe asthma and is associated with increased morbidity.

038 INVESTIGATING PLACE EFFECTS ON HEALTH: A SPATIAL APPROACH V THE MULTILEVEL APPROACH

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Introduction: Past studies that have investigated place effects on health have been conducted with the multilevel approach where variations in a space subdivided into areas are investigated with multilevel models. However, it may be a strong limitation to rely on a space fragmented into areas. Conversely, we suggest using a continuous concept of the space that can be operationalised with a geographical information system, and propose to use spatial modelling techniques and place indicators that continuously consider the space around the individuals' place of residence. To compare this spatial approach with the more conventional multilevel approach, we investigated geographic variations of healthcare utilisation behaviour in France.

Methods: We used French survey data collected in 1998 and 2000 linked with administrative data on healthcare consumption. The first binary outcome variable indicated whether each individual had a regular primary care physician or not. A second binary outcome indicated whether the individuals had a per cent of 1 year consultations with specialists rather than primary care physicians over 50%. We compared multilevel models with spatial mixed models that define the correlation between individuals as a function of the spatial distance between them. The models were adjusted for several health, demographic and socioeconomic variables. Regarding place indicators, we considered the population density, the per cent of individuals with a low education and indicators of supply of physicians.

Results: From the multilevel models, we found significant variations for both outcomes at the municipality level or at the level of the broad areas (p<0.001). From the covariance parameters in the empty spatial models, we found that the correlation in the risk of not having a regular primary care physician was 0.028 for individuals located at the same place, but only 0.015 for individuals located 10 kilometres away (figures were 0.029 and 0.026 for having a high per cent of consultations with specialists). For both outcome variables, the scaled deviance was

markedly lower in the empty spatial model than in the empty multilevel models, indicating a better fit of the spatial covariance structure to the data. The socioeconomic level in the place of residence and the supply of physicians were independently associated with healthcare utilisation behaviour. Associations were stronger when measuring place indicators within a continuous space rather than within the usual administrative areas. These different approaches for measuring place effects also lead to different pictures when identifying places with different levels of exposure to contextual characteristics.

Conclusions: Considering an illustrative example, we found evidence that an approach combining spatial modelling techniques and definition of place indicators in spatial rather than territorial or administrative neighbourhoods was more appropriate to account for the spatial variability of the healthcare utilisation behaviour under study.

039 USING MEASURES OF CLUSTERING IN LOGISTIC REGRESSION TO INVESTIGATE CONTEXTUAL EFFECTS: AN EXAMPLE ON HEALTHCARE UTILISATION IN SWEDEN

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Introduction: Measuring the extent to which health phenomena occur in cluster is highly informative for public health policymakers. Indeed, the magnitude of clustering can be viewed as an indication of the extent to which a contextual dimension must be included in prevention or intervention programmes. For continuous outcome variables, multilevel models provide a convenient measure of clustering in the form of the intraclass correlation coefficient (ICC). However, for binary outcome variables, only approximate definitions exist for the ICC. Therefore, Klaus Larsen and colleagues propose to express the magnitude of clustering in the well known odds ratio scale with an index termed the median odds ratio (MOR) that can be easily computed from multilevel logistic models. On the other hand, alternating logistic regression (ALR) models are now recognised as an interesting alternative to multilevel logistic models. They quantify clustering with a pair wise odds ratio that considers the degree of similarity between individuals residing in the same area. Investigating healthcare utilisation behaviour with Swedish data, we compared these different approaches to measure the magnitude of clustering, and compared their advantages and drawbacks in a user oriented perspective.

Methods: We used Swedish data from the Health Survey 2000 conducted in the county of Skåne in Sweden. The binary outcome variable distinguished the individuals who consulted private healthcare providers from those who only used public providers. Multilevel models and ALR models adjusted for individual level confounders were fitted to the data. We examined whether the per cent of high educated inhabitants in the area of residence had an impact on the propensity to use a private healthcare provider.

Results: The multilevel model indicated that the area level variance in the propensity to use a private provider was highly significant. From the multilevel model, we found that the ICC was equal to 0.08. The MOR was equal to 1.81. The ALR model indicated that the POR was equal to 1.37 (95% CI 1.19 to 1.57). Both the multilevel and ALR models indicated that the amount of clustering was higher among old individuals than among young individuals. This complex pattern of variations was in part explained by the per cent of inhabitants with a high education in the area of residence: the per cent of high educated inhabitants was positively associated with the propensity to use a private provider, and had a stronger impact among old individuals than among younger ones.

Conclusions: Measuring the magnitude of clustering of health related phenomena provides important information for public health policymakers. Since the ICC, the MOR and the POR provide information on clustering under different forms, it is important to compare their statistical consistency and interpretability in a public health user oriented perspective.

040 DOES SULT1A1 GENOTYPE MODIFY THE ASSOCIATION OF ACTIVE AND PASSIVE SMOKING WITH BREAST CANCER RISK?

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Introduction: Sulfotransferase (SULT) 1A1 is involved in the inactivation of oestrogens and in the metabolism of pro-carcinogens such as

heterocyclic amines and polycyclic aromatic hydrocarbons, both of which are present in tobacco smoke. Recently, we reported a differential effect of NAT2 genotype on the association between active and passive smoking and breast cancer (Chang Claude *et al* 2002). The additional investigation of a SULT1A1 genetic variant associated with reduced enzyme activity and stability might therefore provide a deeper insight into the modification of the susceptibility for breast cancer.

Methods: We employed a population based case control study in women up to age 50, which was conducted in Germany. A total of 394 pre-menopausal breast cancer patients and 835 age matched controls with information on genotype and detailed smoking history were included in the analysis. Genotyping was carried out using a fluorescence based melting curve analysis method. We performed multivariate logistic regression analysis to estimate breast cancer risk associated with the SULT1A1 Arg213His polymorphism in relation to smoking and other risk factors.

Results: The overall risk for breast cancer in women who were carriers of at least one variant allele (53.3% of women with breast cancer and 57.7% of controls) was not significantly different from non-carriers of the variant allele (adjusted odds ratio 0.8; 95% CI 0.7 to 1.1). Odds ratios for breast cancer with respect to several smoking variables did not differ substantially for carriers and non-carriers. However, we observed elevated odds ratios associated with passive smoking only (2.2, 95% CI 0.7 to 7.4) and more than 10 pack–years of active smoking (1.8, 95% 0.5 to 6.1) in NAT2 fast acetylators homozygous for the SULT1A1*1 wild type allele but not in NAT2 fast acetylators carrying the SULT1A1*2 variant allele (1.10, 95% 0.4 to 2.7, and 0.7, 95% 0.3 to 2.1, respectively). The risk for breast cancer associated with high endogenous oestrogen exposure was not found to be altered by SULT1A1.

Conclusion: Our data failed to support a possible association between pre-menopausal breast cancer risk and SULT1A1 genotype (Zheng *et al* 2001; Tang *et al* 2003) or a significant interaction with active smoking (Saintot *et al.* 2003). We found no evidence that the SULT1A1 genotype in itself is an important effect modifier of breast cancer risk associated with smoking or endogenous oestrogen exposure. The SULT1A1*1/*1 genotype in combination with NAT2 fast acetylator, however, seemed to increase breast cancer risk in women exposed to tobacco smoke.

041 | HEALTH OBSERVATION AND HEALTH REPORTING: FINDINGS FROM A PILOT STUDY IN FLORENCE

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Introduction: There is an increasing need to describe population's health status as well as that of specific groups of individuals by means of objective tools, which allow comparing data through time and space. This need interests all the institutions in charge with decision making and investments for public health. There are two types of survey that allow to ascertain the health status of a population at a defined time point; the first type requires self administered questionnaires to interview individuals (Health Interview Survey, HIS); the second one is characterised by questionnaires administered by a doctor in a face to face interview as well as by medical investigation that involves physical and biochemical measurements (Health Examination Survey, HES). In Italy, the Italian National Census Bureau (ISTAT), with the title Health Conditions and Health Care Services Use (Condizioni di salute e ricorso ai servizi sanitari), has carried out a HIS. No HES survey has been carried out in Italy yet, while a pilot study Health in Florence took place in Florence between the end of 2000 and the summer 2001. This study was carried out on a part of the general population sample that had previously undergone the investigation during the HIS ruled by ISTAT during the period 1999–2000.

Method: The study Health in Florence concerns the same probability sample drawn by ISTAT in Florence for the HIS, even if only the individuals aged 35-74 years were selected among the HIS examinees, as in this group of age the frequency of pathologies is higher. Data from 343 examined individuals (47% men, 53% women) were analysed. Questions in HIS and questions and measurements and diagnostic criteria in HES, allowed collecting information about some relevant diseases and health problems such as: myocardial infarction, ictus, diabetes, hypertension, hyperglycemia, osteoporosis, as well as physical characteristics (height, weight, body mass index), and lifestyles (smoking habits). Appropriate statistical methods were applied to compare data from the two surveys, such as K statistics, Mc Nemar and Student's *t* tests.

Results: From this comparison, it was possible to attribute a higher sensitiveness to the medical investigation in the ascertainment of diseases

in comparison with the self administered questionnaires, in particular for hypertension, diabetes, and osteoporosis. Further, in this study, as well as in many other similar investigations, there is a difference between measured height and weight, and those self perceived: men and women perceive themselves taller and slimmer than they are.

Conclusions: This pilot study has firstly shown the feasibility of an HES within the Italian National Health System; further, the comparison between the HIS and the HES shows the usefulness of integrating and sharing information from the two sources.

042 | EPIDEMIOLOGICAL STUDY OF MORTALITY DURING THE SUMMER OF 2003 IN ITALY

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Introduction: It is widely recognised that extreme climatic conditions during the summer months can constitute a major public health threat. Persons living in cities have an elevated risk of death when the temperature (and humidity) are high, compared with those living in suburban and rural areas (urban heat island effect). Studies on heat wave related mortality have further demonstrated that the greatest increases in mortality occur in the elderly. Following the unusually hot summer of 2003, together with the dramatic news from neighbouring countries such as France, the Italian Minister of Health requested the Istituto Superiore di Sanità's Office of Statistics to undertake an epidemiologic study of mortality in Italy during summer 2003, to investigate whether there had been an excess of deaths, with a particular focus on the elderly population.

Methods: Communal offices, which maintain vital statistics, were asked for the number of deaths among resident people, registered during the period 1 June to 31 August 2003 and the same period during 2002, for each of the 21 capitals of the Italian regions. Within the framework of collaboration with the Italian Central Office for Agriecology (UCEA), meteorological data (minimum/maximum temperature and humidity) were obtained for the observed periods 2002 and 2003; this allowed us to calculate discomfort indexes, such as the Humidex.

Results: Compared with 2002, during the three summer months (1 June to 31 August 2003) there was an overall increase in mortality of 3134 (from 20 564 in 2002 to 23 698 in 2003). The greatest increase regarded elderly people: 2876 deaths (92%) occurred among people aged ≥75 years. The increase in mortality was greatest in the cities belonging to the northwest of the country (31.5%), followed by the south (17.8%), the northeast (16.4%), and the centre (16.3%). With respect to each city, the greatest increase was observed in Turin (45%), where the deaths more than doubled during the first 15 days of August, Milan (30.6%) and Genoa (22.2%). It is noteworthy that some cities in the south experienced their highest increase in mortality during the last period of August; in Bari the overall excess mortality was 33.8%, but in the last part of August it reached 137%. In these cities, the relationship between mortality and climatic indexes (t. max, Humidex) was investigated and a clear correlation was observed.

Conclusion: Lessons learnt and measures to be taken in Italy to prevent the health impact of heat wave: the Italian Minister of Health has started a programme, involving the cities where the highest increase of mortality was observed (such as Milan, Turin, Genoa, and Rome), to identify the elderly at risk, and to provide measures in order to avoid harms to their health during summer.

043 | ACUTE DIARRHOEA IN A REFERENCE HOSPITAL IN SOUTHEAST BRAZIL

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Introduction: Acute diarrhoea is common in Brazilian children, however little is known about case aetiology and outbreak dynamics. Epidemiological monitoring and vigilance groups are still coming up against poor laboratory support.

Objective: The object of this work is to analyse the temporal distribution and related variables of diarrhoea in children who attended the emergency department of an important regional hospital in southeast Brazil in 2002 and 2003.

Method: Poisson's multiple regression model was adjusted, considering serious cases (admission and/or intravenous rehydration therapy (IRT)) as the dependent variable, and the following as independent: age group (less than 1 year old, 1–4 years old, and 5–12 years old), concurrent respiratory symptoms, and time of occurrence.

Results: Case temporal analysis revealed a seasonal pattern with a marked incidence peak in September 2002 and a less intense one in September 2003. The significant variables from the final adjusted model suggested that occurrence time of serious cases was linked to the 5–12 year age group; the curves were similar (p = 0.78). The other groups did not follow the model in serious cases where IRT was given (less than 1 year old p = 0.05, and 1–4 years old p = 0.03). The model showed that the cases associated with respiratory symptoms also had the same distribution pattern as those admitted and/or given IRT.

Conclusion: Even though this was not a population study, case notes in an important regional hospital can function as an early sentinel site, indirectly reflecting what could be happening in the population. This study allowed us to investigate diarrhoea outbreaks in a region where an aetiological study was impossible. Epidemiological vigilance of diarrhoea, particularly in children, assumes differential diagnosis between different aetiologies, which is impossible in regions without laboratory support. The epidemiological vigilance team should take advantage of instruments that allow them to identify outbreaks and raise hypotheses on their aetiology, which would otherwise not be detected.

044 IDENTIFYING GROUPS OF INDIVIDUALS IN A POPULATION USING MULTIDIMENSIONAL INSTRUMENTS VIA CLUSTER ANALYSIS

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Multidimensional instruments have been widely used in studies aimed at measuring heterogeneous aspects of populations. With the advent of electronic data analysis, such instruments have become more and more complex, thus hindering statistical analysis and interpretation. Therefore, a home survey was conducted in a medium sized city in south eastern Brazil using an instrument with 172 variables to learn about the profile of elderly people (welfare, disease prevention, material comfort, social relationships, satisfaction concerning intellectual capabilities and manual skills, and level of physical activity), reported morbidity, mental evaluation, and the population's opinions on the meaning of quality of life in old age. The variables were evaluated in blocks for each lifestyle category, morbidity, and level of physical activity. The questions were measured on different scales and one question was open. Where answers were on a 1–7 scale, the variables were dichotomised with four established as the cutting point. Where answers were categorised as "yes", "almost always", "sometimes", and "no", they were also grouped into two classes so that "yes" and "almost always" were regarded as one class, and "sometimes" and "no" as another. The open question was categorised according to the most frequent answers and then dichotomised as "yes" and "no" for each elderly person. Thus, the dataset consisted of binary variables in which various cluster analysis methods were tested with various suggestions for the distance matrix using STATISTICA v.5.0 software. There were practically no differences in any clusters; therefore a distance matrix was made using Euclidean distance and the ward clustering method; this is based on analysis of variance, aimed at minimising the sum of squares between two hypothetical clusters in each step. A first cluster was obtained with 11 binary variables from answers to the open question, where three groups of elderly people were observed: i) those who valued aspects related to work, religion, rectitude, and charity as quality of life; ii) those who valued leisure, material possessions, and healthy habits; and iii) those who valued interpersonal relationships, good health, and mental balance. These 11 variables were then reduced according to three clusters and including the other variables from the other domains and observing the formed clusters gradually constructed hierarchical dendrograms. As a final result, cluster analysis revealed four groups and identified the profiles of the elderly individuals.

045 EFFECT OF WORK AT EARLY AGES ON THE FINAL HEIGHT: A COHORT STUDY

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Introduction: There has been controversy about the adverse effect of working at early ages on human growth. This debate seems to come from differences in study designs (mostly cross-sectional) and the difficulties in controlling for socioeconomic factors. Moreover, most of the evidence comes from underprivileged communities.

Objective: To assess the effect of childhood work (less than 14 years old) on height of a 23/24 year old population based cohort born in 1978/1979 in Ribeirão Preto, the wealthiest area in a developing country, Brazil.

Methods: From 6728 valid questionnaires obtained from the mothers when they gave birth to a singleton born alive at the initial cohort, 1071 (15%) individuals (518 males and 553 females) were re-examined at 23–24 years old. Childhood work was classified in three categories according to the age at the first job: less than 14; 14–16; ≥17 years. Those who identified themselves with oriental ascendance were excluded from the study. Height measurements in centimetres were obtained clinically at the follow up examination. Social economic status was measured through education, ethnicity, family income at birth, number of siblings, secondary exposure to tobacco at home, and mother's age and education. Known determinants of height were also considered: order of birth, birth weight, birth length, and smoking status. The analysis was performed separately for males and females. Covariance analysis followed bivariate and stratified analysis. Variables were selected into the model using a backward stepwise like selection of the variables.

Results: Height average was 175.8 cm (SE 0.3) and 162.7 cm (SE 0.3), respectively for males and females. In the bivariate analysis child work was negatively associated with height for both males (p = 0.002) and females (p = 0.003). However, when adjusted for covariates the strength of association was reduced (males p = 0.229 and females p = 0.142). Trend test was only borderline significant for males (p = 0.086) and no interaction was observed between working at early ages and other covariates in any of the models. For males the most important predictors of height were: mother's ethnicity (p <0.001), mother's age (p = 0.008), and birth length (p <0.001). For females the most important covariates associated with height were: mother's age (p = 0.004), birth length (p = 0.006), and birth order (p = 0.003). Education (p = 0.008) and family income (p = 0.091) were only borderline significant.

Conclusions: Our results seem to not support the hypothesis of working influence on height after considering socioeconomic factors. At least for this population, it seems that socioeconomic factors play the most important role in the determination of height.

046 SELF REPORTED PREVALENCE OF RHEUMATIC DISEASE PATHOLOGIES IN A REPRESENTATIVE SAMPLE OF AN URBAN POPULATION

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Introduction: Muscular–skeletal conditions are a fundamental cause of individual disease and of health expenditure in evolved societies. Due to this, the present study was performed to determine the prevalence of some of these pathologies in a representative sample of the adult population of the city of Porto.

Methods: The 1057 participants evaluated (667 women and 390 men; equal to or older than 18 years of age) were selected as part of a population health survey (EPI-Porto), through random telephone digit dialling (participation 70%) of residents in the city of Porto. All responded to a questionnaire, which included questions about lifestyle, behaviours, and personal and family disease history. In particular, they were questioned about whether their physician ever diagnosed them as having rheumatoid arthritis, lupus, ankylosing spondylitis, psoriatic arthritis, hip or knee osteoarthritis, and chronic low back pain.

Results: At least 30.6% of women and 14.6% of men reported one of these pathologies. A prevalence of rheumatoid arthritis in women was 2.2% (95% CI 1.3 to 3.8) and 0% (95% CI 0.3 to 1.4) in men. Globally, the frequency of lupus was 0.3% and 0.7% for ankylosing spondylitis, similar in both sexes. Arthritis in the hip (7.5% v 2.6%), in the knee (14.2% v 6.2%) and lower back pain (17.4% v 7.4%) were significantly more frequent in women and increased with age.

Conclusion: One in every four adults reported at least one diagnosis of a rheumatic pathology revealing the marked public health importance and healthcare needs of individuals with muscular-skeletal conditions.

047 WHAT LIFESTYLE FACTORS ARE ASSOCIATED WITH HIGH RISK HUMAN PAPILLOMA VIRUS (HPV) INFECTION IN WOMEN WHO HAVE HAD ABNORMAL CERVICAL SMEARS? RESULTS FROM THE TOMBOLA TRIAL

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Introduction and Objectives: Human papilloma virus (HPV) is a sexually transmitted virus. Some high risk types of HPV have been implicated in cervical cancer and pre-cancer. There is current debate as to whether HPV testing could be employed within cervical screening, either as a primary screening tool, or in triage of women to appropriate follow up after an abnormal smear. This debate would be informed by increased understanding of the epidemiology of HPV infection. There is relatively little UK data, and data from other populations may not be generalised due to different patterns of sexual behaviour. In this analysis we describe factors associated with HPV infection in UK women.

Methods: Subjects comprised 5031 women aged 20–59 years, resident in Grampian, Tayside or Nottingham, with a smear taken in the UK Cervical Screening Programmes between 1999 and 2002 and assessed for eligibility for TOMBOLA (Trial Of Management of Borderline and Other Low-grade Abnormal smears). All had a current smear reported as normal, or showing some degree of abnormality, and up to one previous borderline smear. They had an HPV test and completed a lifestyle questionnaire. HPV analysis was by PCR using consensus GP5+/6+ primers and a 14-probe cocktail to detect high risk types. Women were categorised as high risk HPV positive (hrHPV+ve) or negative. Associations between lifestyle factors and HPV status were analysed using logistic regression.

Results: 39.2% of women were hrHPV+ve. The two most important predictors of hrHPV status were age and smear status. Older women were at lower risk of being hrHPV+ve than younger women (odds ratio (OR) 50–59 years v 20–29 = 0.21, 95% CI 0.15 to 0.29). The risk of being hrHPV+ve increased with increasing severity of current smear. Compared with women with a current normal smear, the OR for women with a current borderline smear was 2.8 (95% CI 2.3 to 3.5) and for women with a first mild smear was 6.7 (95% CI 5.4 to 8.5). After adjustment for smear status and age a number of other factors were associated with hrHPV positivity. Having a university/college degree reduced risk (OR = 0.77; 95% CI 0.63 to 0.93), as did having had a child (OR = 0.74, 0.63 to 0.87). Married/co-habiting women were at lower risk than other women. Non-white women were at higher risk than white women (OR = 1.37; 95% CI 1.00 to 1.87). Risk was increased in pill users (OR = 1.23; 95% CI 1.06 to 1.44) and current smokers (OR = 1.19; 95% CI 1.03 to 1.38). Level of physical activity, current condom use, and current use of hormonal contraception (other than oral contraceptives) were not associated with hrHPV infection. Information on number of sexual partners was not available.

Conclusions: In this large series we have found associations between several lifestyle factors and hrHPV status. These factors are highly inter-related, and some may be markers for other risk factors. Epidemiological data of this type will inform the debate on HPV testing.

048 THE HYGIENE HYPOTHESIS: EPIDEMIOLOGIC TRANSITION AND DISEASE THEORIES NEW CHALLENGES

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An important aspect in the epidemiologic profile of the industrialised Western countries is the tendency of growth of allergic and autoimmune diseases prevalence that has been happening since the middle of the 20th century. The so-called hygiene hypothesis, intensely researched in past years, establishes a connection between this growth and the decrease of infectious diseases in those countries, especially intestinal infections. Recent works formulate that the lymphoid tissue stimulation by infectious agents would be involved in the maturation processes of the mucosal immune system in early childhood and, when inadequate or insufficient, the risk of atopy is accentuated. This new field of problems and discoveries takes new elements into consideration about the epidemiologic transition processes in Western societies. It also allows rethinking some controversial aspects in the history of epidemiologic diseases theories.

The process in which infectious diseases incidence tends to decrease inversely to allergic and autoimmune diseases increase is not just explained by demographic, environmental, and sociocultural changes. Another explanation level in which those diseases would be biologically interconnected is added. Allergic and autoimmune diseases would be a consequence of a disturbance of regulatory mechanisms involving complex molecular interactions in which microorganisms would be involved. Researchers suggest that the protective or harmful effect of bacterial molecules is likely to depend on the dose and ''a complex mixture of the timing of exposure during the life cycle, environmental and genetic cofactors''. At a molecular level, health and disease would correspond to mechanisms of balance, closer to the idea of predisposition. The objective of the research about the hygiene hypothesis, still cause-centred, is to identify microbes in doses and circumstances capable of preventing atopy without causing disease. However, maybe the scientific development at molecular level is creating the conditions for a new epistemological discontinuity that would make a victory of previously discredited perspectives.

049 LONG TERM PREDICTORS OF ASTHMA SEVERITY: A PROSPECTIVE POPULATION BASED LONGITUDINAL STUDY

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Introduction: Identifying factors predicting asthma severity might help to prevent the most serious consequences of the disease or at least to better monitor its progression.

Objective: The aim of this study was to identify long term prognostic factors of asthma severity in a cohort of asthmatics, followed from 1992 to 2002.

Methods: Between 1991 and 1993, in the ECRHS I, 1482 adults with asthma from 27 centres was identified in 13 countries. Of these, 980 (66%) were reassessed 9 years later (ECRHS II). At the end of follow up all current asthmatics were classified according to the severity of the disease, using the GINA criteria, which are based both on clinical features and current treatment. Severe asthma was considered present if a subject was classified as moderate/severe asthmatic. A two level logistic random intercept model assessed the association of baseline characteristics with severe asthma, with individuals as 1 level units and centres as 2 level units.

Results: At the end of follow up and according to the GINA criteria, out of these 980 asthmatics, 457 (46.9%) had intermittent asthma, 83 (8.5%) mild persistent, 133 (13.6%) moderate persistent, 141 (14.5%) severe persistent, and 161 (16.5%) were in partial remission (that is, no symptoms, no exacerbations, no asthma medication in the past year). At baseline, severe asthmatics were older, more were women, and a higher percentage reported a familiar history of asthma and a low educational level. They had poorer lung functions (FEV_1, FEV_1% predicted, and FEV_1/FVC) and worse control of symptoms (symptom score) than less severe asthmatics. Furthermore, they had a higher total IgE level, a higher percentage of subjects tested positive to the methacholine test and sensitised to *D Pteronyssus*, *Cat* and *Cladosporium herbarium*. When mutually adjusted in a multilevel logistic model, the baseline factors significantly associated with a subsequent severe asthma were: FEV_1% predicted (OR 0.96; 95% CI 0.96 to 0.98), total IgE [ln] (OR 1.6; 95% CI 1.2 to 2.2), poor control of symptoms (OR 1.14; 95% CI 1.0 to 1.29), a familiar history of asthma (OR 1.8; 95% CI 1.2 to 2.8), and age at onset of asthma (OR 1.02; 95% CI 1.00 to 1.04).

Conclusions: At the end of follow up, a non-negligible proportion of asthmatics were in partial remission (16%). Besides poor lung function and poor control of the disease, a later onset of asthma and a history of familiar asthma are long term predictors of severe asthma.

050 COMPARISON OF PREGNANCY OUTCOMES AND UTILISATION OF PRENATAL CARE BETWEEN IMMIGRANT AND ITALIAN WOMEN

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Introduction: Migration to Italy from developing countries is increasing. In 2000 there were about 25 000 babies born to foreign mothers (about 5% of the total national births). Only few data are available on the health conditions of immigrants. The aim of the study was to compare utilisation of prenatal care, modality of obstetric care, and pregnancy outcomes in foreign born (FB) and Italian born (IB) mothers.

Methods: The study was carried out in the Lazio region of Central Italy, which has 5 000 000 million inhabitants. Information was obtained from neonatal administrative hospital discharge records, containing data on maternal and neonatal characteristics. During the years 2001–2002 there were 82 619 live births among IB mothers and

13 015 among FB mothers. Assignment to ethnic groups was done according to the place of birth of the mother: the greatest group was from the Eastern Europe countries (n = 4787), in particular Romania, and the smallest from Central Africa (n = 831).

Results: The utilisation of prenatal care was lower in immigrant mothers. Twelve per cent of FB mothers had the first prenatal visit after 12 weeks of gestation compared with 2.8% of IB mothers. Among women aged above 35 years, the use of amniocentesis was 19.9% in the FB group and 44.4% in the IB group. The prematurity rate (gestational age under 37 weeks) was 8.5% for FB and 6.7% for IB mothers. The caesarean section rate standardised for gestational age was lower in FB than in IB mothers (32.9% v 39.4%). The rate of neonatal transfer to different hospitals for serious medical conditions was 2.1% for FB group and 1.5% for IB group. Low 5 min Apgar score (<7) was more frequent among the newborn of FB mothers: 1.3% compared with 0.8 among those of IB mothers. The inhospital mortality was 4.2/1000 births for those born to FB mothers and 3.2 for those born to IB mothers (p = 0.06). However, there were no differences in the inhospital mortality among babies with gestational age less than 37 weeks (36.1/1000 births for those born to FB mothers and 34.7 for those born to IB mothers) and in the incidence of neonatal respiratory diseases (1.2 v 1.1).

Conclusions: We observed a high disparity in the utilisation of prenatal health services, as well as a higher prematurity rate and inhospital neonatal mortality, among immigrant mothers. These results should be taken into consideration when making policies for the promotion of mother and child health in the immigrant population.

051 | MATERNAL SOCIOECONOMIC STATUS, SMOKING DURING PREGNANCY, AND THE RISK OF LOW BIRTH WEIGHT

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Introduction: Smoking during pregnancy and unfavourable socio-economic factors are related to the higher risk of low birth weight.

Aim: To evaluate the risk of low birth weight according to socio-economic factors among smoking and non-smoking expectant women.

Methods: Case-control study involved 851 newborns with low birth weight (<2500 g) and 851 normal weight newborns. The study started 1 February 2001 and ended 31 October 2002 in six main maternity hospitals in Lithuania. Mothers of newborns were interviewed on the first or second day after delivery using the structured questionnaire. The database was processed by the application of statistical package SPSS for Windows v.10.0.

Results: Prevalence of smoking during pregnancy was higher among mothers with unfavourable socioeconomic factors (19.5–35.2%), if compared to mothers in favourable socioeconomic groups (11.5–16.6%), with the clear tendency to be even higher among cases if compared to controls. Risk of low birth weight was significantly higher for smoking mothers in the univariate stratified analysis. Smoking mothers who were unemployed or had unstable marital status were at the highest risk to deliver low birth weight baby, OR 4.6 and 4.8, respectively. Smoking during pregnancy among mothers with low income increased the risk of low birth weight by 3.5 times, while smoking mothers living in rural area had 2.5-fold higher risk of low birth weight. Logistic regression analysis showed the statistically significant independent influence of low education, low income, unemployment, and smoking during pregnancy on the risk of low birth weight.

Conclusions: Smoking during pregnancy is more prevalent among mothers with unfavourable socioeconomic factors. Smoking during pregnancy in combination with the socioeconomic inequalities is significantly associated with the higher the risk of low birth weight.

052 | IMPACT OF MULTIPLE BIRTHS ON THE PREVALENCE OF CONGENITAL ANOMALIES IN EUROPE

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Introduction: The EUROCAT project is a European network of population based registries set up in 1979 to carry out epidemiologic surveillance of congenital anomalies. Currently over 1 000 000 births are surveyed per year throughout 36 registries in 18 countries of Europe. Multiple births are known to be at higher risk than singletons for congenital anomaly. The proportion of multiple births is steadily rising due mainly to advances in fertility treatment, as well as increasing maternal age.

Objective: To assess the effect of the rising proportion of multiple births on the prevalence of congenital anomalies in Europe.

Methods: Data from 32 population based registries of congenital malformations (EUROCAT) for the years 1980–2001.

Main Outcome Measure: Proportion of congenital anomaly cases resulting from multiple pregnancies.

Results: There has been a gradual increase in the proportion of multiple births among congenital anomaly cases over time, rising from 3.1% in 1980–84 to 3.5% in 1996–2001. This represents a prevalence of 0.66 per 1000 total births in 1980–84 rising to 0.78 per 1000 total births in 1996–2001. 4.8% of cases from multiple births were from higher order multiple births (triplets and so on), almost doubling from 0.09% in 1980–84 to 0.16% in 1996–2001. Nearly a fifth of twin cases were from twin pairs concordant for malformation. Among non-concordant twins 1996–2001, 5% of cases resulted in termination of pregnancy of the affected twin following prenatal diagnosis compared to 15% of singletons.

Conclusions: One of the implications of the rise in multiple births in Europe associated with fertility treatment is its effect on the number of children born with congenital anomalies. Multiple births with congenital anomalies also present difficult problems on prenatal diagnosis of one affected foetus. Further analysis of EUROCAT data will determine anomaly specific risks, risks among higher order multiple births, and regional variation.

053 | ACUPUNCTURE IN ROUTINE CARE STUDY (ARC): EFFECTIVENESS OF ACUPUNCTURE IN PATIENTS WITH ALLERGIC RHINITIS

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Introduction: Complementary and alternative medicine treatment such as acupuncture is increasingly used by patients with allergic rhinitis (AR). The aim of the study was to investigate the effectiveness of treatment with v without acupuncture in patients with AR in general medical practice.

Methods: In this randomised study, patients (>17 years) with AR were randomised either to an acupuncture group (ACU) or a control group (CON). ACU received up to 15 acupuncture treatments over a period of 3 months after entering the study, whereas CON received no acupuncture in the first 3 months. CON received also up to 15 acupuncture treatments in months 4–6. At any time in the study ACU and CON were free to use routine care for AR. Patients filled in standardised questionnaires including sociodemographic data, rhinitis quality of life questionnaire (RQLQ, score minimum, 0; score maximum, 6) and generic quality of life (SF-36) at baseline and after 3 and 6 months.

Results: Altogether, 981 patients (64% female, 39.4 (SD 11.2) years and 36% male, 40.7 (13.0) years) were randomised. At baseline there was no difference between the groups in RQLQ (ACU and CON 3.1 (1.1)). After 3 months there was a significant difference in the RQLQ score (p<0.001) in favour for ACU (ACU 1.5 (1.2) v CON 2.6 (1.5)). The symptoms of ACU according to the RQLQ score improved again significantly (p<0.001) between month 3 and 6. Similarly, after 3 months we found a significant difference (p<0.001) in favour for ACU v CON on both component scales of the SF-36. After 6 months there was no significant difference for the RQLQ score and both component scales of SF-36 between both groups.

Conclusion: Patients suffering from AR showed a significant and clinically relevant improvement of quality of life after treatment with addiional acupuncture compared to patients in routine care without acupuncture.

054 | TYPE 1 DIABETES IN CHILDREN AND SOCIOECONOMIC FACTORS AT AREA LEVEL IN NORTH RHINE-WESTPHALIA, GERMANY

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Introduction: The incidence of type1 diabetes is increasing worldwide. Despite decades of intensive research, the aetiology of type1 diabetes mellitus (T1DM) is still unknown. Socioeconomic conditions have a strong impact on health, particularly on children's health. Discovering relationships between T1DM in childhood and factors of the social environment could contribute to the aetiological clarification of the disease.

Methods: In an ecological study we investigated the association between the incidence of T1DM in children up to 14 years old and the socioeconomic factors at area level in North Rhine-Westphalia (NRW) between 1996 and 2000. The incidence data were derived from the Diabetes Registry NRW. Regional data for the social status were provided

by official statistics. Analytical methods were the Spearman's rank correlation, the Poisson regression, and a bootstrap method for estimating confidence intervals of the non-normal distributed correlations.

Results: A significant correlation was found between a population based income ratio (quotient of low to high income groups) and the type1 diabetes in children under 5 years ($r = 0.57$ (95% CI 0.32 to 0.77)) respectively under 15 years ($r = 0.63$ (95% CI 0.36 to 0.77)). A similar trend was detected for the association between a deprivation index, including household income, education and professional training, and the diabetes incidence. An inverse correlation between population density and type1 diabetes incidence was also found in children under the age of 15 years ($r = -0.38$ (95% CI -0.62 to -0.10)).

Conclusions: These results indicate an association of a higher diabetes incidence in regions with lower socioeconomic conditions. To avoid an ecological fallacy the correlations should be proven on individual level. As T1DM is a rare disease a well prepared case-control study would fit to verify the hypothesis.

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055 A PHARMACOEPIDEMIOLOGICAL APPROACH TO ESTIMATE DIABETES TYPE 2 PREVALENCE

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Introduction: Prevalence of chronic diseases, such as diabetes, treated on a daily basis with drugs that are specific to that pathologic entity can be estimated through the use of both drug sales data and drug consumption pattern. However, the accuracy of this estimate is affected by the proportion of patients treated with combinations of two or more different classes of drugs.

Objective: The aim of this study was to estimate the Portuguese drug treated diabetes type 2 prevalence using drug consumption data, taking into account the proportion of patients that use more than one drug for the same indication.

Methods: The drug treated diabetes prevalence estimate was based on the formula proposed by Sartor and Walckiers (1995), considering: (1) the total amount of oral hypoglyaemic agents (OHAs) sold in Portugal during 2003 based on IMS Health data; (2) the defined daily dose of each OHA, as proposed by the WHO Collaborating Centre for Drug Statistics Methodology; and (3) a weighing factor (w) based on the proportion of individuals taking an association of OHAs, obtained in a national survey. The drug consumption pattern, concerning OHAs, was obtained in a descriptive, cross national survey performed in 2003, in 118 community pharmacies distributed all over the country. Each pharmacy was asked to recruit 15 patients presenting a medical prescription with at least one OHA. Pharmacists using a structured questionnaire collected information regarding sociodemographic and therapeutic characteristics.

Results: Drug use study: we have studied a sample of 1113 type 2 diabetics (575 women, 532 men, 6 sex unknown), with a mean age of 64.3 (SD 11.0) years and a mean duration of the disease of 9.8 (SD 9.0) years. OHAs were prescribed as monotherapy in 46.7% (520/1113) of the patients, with sulphonylureas being the most frequently prescribed class (56.4%). The remaining 593 diabetics (53.3%) received from 2 to 4 OHAs concomitantly. In the 2 agent regimen, Sulphonylurea + Biguanide was the most popular association. Diabetes prevalence: using the methodology proposed by Sartor and Walkiers, the prevalence of drug treated diabetes type 2 was estimated to be 2.52%, which is close to the value assumed by the National Health Authorities, that is, 2.7%.

Conclusions: Attending the high prevalence of polytherapy in our clinical practice, it is imperative to use an estimator based on the proportion of patients that use more than one OHA in order to obtain a valid estimate. The estimate of diabetes prevalence from drug consumption data appears to be a valid approach. The authors considered that this is a cost effective strategy to monitor the disease prevalence from an epidemiological perspective.

1. **Sartor Fe**, Walkiers D. *American Journal of Epidemiology* 1995; **141**(8):782–7.

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056 INDIVIDUAL AND AREA FACTORS ASSOCIATED WITH GP INTEGRATION IN AUSTRALIA: A MULTILEVEL ANALYSIS

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Aim and Background: The further integration of primary care within the wider health system is an imperative for reform in all countries. The aim of this paper is to determine the factors associated with GP integration using the recently developed GP integration index.

Methods: A database, derived from an Australia wide mail questionnaire survey of 1256 GPs drawn from a 20% stratified random sample of 123 divisions of general practice (51.7% response rate) was used. The GP Integration Index consists of nine scaled GP integration factors, and their two associated two higher order factors: primary care management (PCM) and community health role (CHR), as well as five GP integration enabling factors. A multivariate multilevel analysis was undertaken. An explanatory model for both PCM and CHR based on the GP integration factors as well as general practice, GP and regional characteristics was proposed.

Results: The principal findings were that CHR and PCM were most strongly associated with GP integration enabling factors (mainly at the individual level) and, for CHR only, with urban rural location (mainly at the area level). The most important single explanatory variable for both PCM and CHR was the GP integration enabling factor, knowledge of local resources. Variables defined by the area unit (The Division of General Practice) explained at most 13% of the overall variance of CHR and almost none for PCM. The important explanatory variables were ones reflecting the way GPs work, rather than their broad ''classification'' within individual or GP setting groupings. Based on these results, some revision to the proposed model was necessary.

Conclusion: Process factors (as compared to structural factors) were more important in relation to GP integration than previously appreciated. Future policy initiatives to promote GP integration should focus on programmes to improve GPs' knowledge of local resources.

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057 ARE THE FRAMINGHAM AND PROCAM CORONARY HEART DISEASE RISK FUNCTIONS APPLICABLE TO DIFFERENT EUROPEAN POPULATIONS? THE PRIME STUDY

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Introduction: Assessment of the absolute risk of coronary heart disease (CHD) is widely used to identify high risk subjects who could benefit from primary prevention. The Second Joint Task Force of European Societies on coronary prevention recommended the use of an algorithm derived from the Framingham risk function although its relevance in the European population is not fully established. Recently, the German PROCAM risk function has been proposed to estimate the absolute CHD risk but its applicability to other populations has never been investigated. We thus assessed whether the Framingham and PROCAM risk functions were applicable to men in Belfast and France.

Methods: We performed an external validation study within the PRIME (Prospective Epidemiological Study of Myocardial Infarction) cohort study. It comprised men recruited in Belfast (2399) and France (7359) who were aged 50 to 59 years, free of CHD at baseline (1991 to 1993), and followed over 5 years for CHD events (coronary death, myocardial infarction, angina pectoris). We compared the relative risks of CHD associated with the classic risk factors in PRIME with those in Framingham (coronary death, myocardial infarction, and angina pectoris), and PROCAM (coronary death or myocardial infarction) cohorts. We then compared the number of predicted and observed 5 year CHD events (calibration). Finally, we estimated the ability of the risk functions to separate high risk from low risk subjects (discrimination).

Results: The relative risk of CHD calculated for the various factors in the PRIME population was not statistically different from those published in the Framingham and PROCAM risk functions. Overall, there was a positive linear relationship between the number of CHD events predicted by the Framingham and PROCAM risk functions and that observed in PRIME. However, the number of predicted CHD events clearly overestimated that observed in Belfast and France. The two risk functions had poor similar ability to separate high risk from low risk subjects in Belfast and France (c-statistic range: 0.61–0.68).

Conclusion: While the use of Framingham and PROCAM risk functions may be suitable for ordering individuals according to their estimated absolute CHD risk, their use seems inappropriate to estimate the absolute CHD risk of healthy middle aged men from low risk (France) and high risk (Belfast) populations because of a clear overestimation. More specific population risk functions are needed. Accordingly, the

SCORE system recently provided charts to estimate the 10 year risk of fatal CHD events in individuals from high and low risk European countries, using large dataset of European countries.

058 | CYS282TYR MUTATION OF THE HAEMOCHROM-ATOSIS GENE IS RELATED TO BODY IRON STATUS, BUT NOT TO CAROTID INTIMA-MEDIA THICKNESS

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Introduction: Heterozygosity for the Cys282Tyr mutation of the haemochromatosis (HFE) gene and increased serum ferritin levels have both been associated with cardiovascular events. The effect of HFE gene polymorphism on atherosclerosis, however, is still unknown. Therefore, the objective of the present study was to examine the relationship between the Cys282Tyr mutation of the HFE gene, body iron status, and atherosclerosis as indicated by carotid intima-media thickness (IMT).

Methods: We assessed conventional risk factors, serum iron parameters (including non-transferrin bound iron, NTBI), and the Cys282Tyr mutation of the HFE gene in 764 healthy subjects, 50–70 years, recruited from a local blood bank and city registers. Carotid IMT was assessed by B-mode ultrasonography.

Results: Ferritin (25th; 75th percentile) was 87 (49; 138) μg/L in carriers of the Cys282Tyr mutation compared to 65 (34; 125) μg/L in non-carriers (p=0.06). Similarly, NTBI (SD) was higher in Cys282Tyr carriers than in non-carriers (2.81 (0.95) v 2.38 (0.88) μmol/L, p<0.001). Also, serum iron, total iron binding capacity, and transferrin saturation was significantly higher in Cys282Tyr carriers compared with non-carriers (all p<0.001). Carotid IMT, however, did not significantly differ between subjects with and without the Cys282Tyr mutation (0.82 (0.11) v 0.82 (0.12) mm, p=0.58). Conventional risk factors, such as age, body mass index, C reactive protein, systolic blood pressure, smoking, and the percentage of current blood donors (54%) did not differ between the two groups.

Conclusion: The Cys282Tyr mutation of the HFE gene is associated with elevated body iron levels. However, this study provides little support for a role of this mutation in the development of atherosclerosis.

059 | THE PREVALENCE OF ERECTILE DYSFUNCTION USING DIFFERENT DEFINITIONS: RESULTS OF THE BERLIN MALE STUDY

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Objectives: To determine the prevalence of erectile dysfunction (ED) in men 40 to 79 years of age in the metropolitan population of Berlin and to investigate the association of the prevalence with different definitions of ED.

Methods: An epidemiological cross sectional study was conducted from May to November 2002. In a population based approach, 6000 men between 40 and 79 years of age were retrieved by the vital statistic office Berlin as a representative sample and received a questionnaire by mail. ED was assessed by five different definitions, of which three are based on the established EF domain criteria: (1) EF ''all'' (including all men); (2) EF ''active'' (including only sexually active men); 3) EF ''confidence'' (including only sexually active men plus inactive men with a low confidence of achieving and maintaining an erection); 4) based on DSM-IV criteria; and 5) based on patients' self assessment.

Results: A total of 1915 questionnaires were eligible for analysis (response rate 32%). The five definitions yielded the following ED prevalence rates (age-adjusted totals): 1) 48%; 2) 31%; 3) 44%; 4) 18%; and 5) 24%.

Conclusions: ED prevalence rates in a metropolitan population were between 18% and 48% depending upon the definition used. The results indicate the need for standardised approaches in future epidemiological studies on ED.

060 | ARE THERE CIRCUMSTANCES THAT DIFFER BETWEEN COMPLETED AND ATTEMPTED RAILWAY SUICIDES? AN ANALYSIS OF 4003 CASES

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Introduction: Railway suicides are considered as a particularly ''hard'' suicide method, which does not allow any ambivalent behaviour once the suicidal act is initiated. Epidemiological reports, however, consistently found a proportion of survivors on the railway track of approximately 10%. Elucidating circumstances surrounding this 10% survival phenomenon may add further information to improve suicide preventive strategies. Our aim was, therefore, to investigate the factors associated with survival of railway suicides comparing fatal and non-fatal outcome of suicide attempts in an ongoing suicide prevention project of the German Railways AG.

Methods: Cases were derived from the central registry of all passenger accidents on the German railway net satisfying the operational definition of an act of suicidal behaviour during the 6 year observation period of 1997 to 2002. The database included information on outcome, sex, age, date, clock time, and local circumstances of the incidence and contained 5731 fatal and non-fatal suicidal acts during the observation period. Among them, sex was documented for 4003 suicide victims which where considered as study population. Statistical associations between categorised variables and diurnal variations were assessed with χ^2 statistics. To determine which variables were associated with completed railway suicides as opposed to non-completed suicides, logistic regression analysis was used.

Results: In 90.5% (3622 cases) of all cases, outcome was fatal with ''death within 30 days'' leading to a fatal to non-fatal ratio of 9.5:1 (p<0.0001). In the non-fatal subgroup, 42.3% of the victims were female whereas the female percentage in the fatal subgroup was only 25.4% (p<0.0001). Age did not differ significantly between both subgroups. A bimodal distribution pattern of non-fatal suicidal behaviour with peaks between >9.00 h and 12.00 h and between >15.00 h and 18.00 h (χ^2 test for equal proportions; df=7; p<0.0001) was found whereas fatal suicides peaked between >18.00 h and 21.00 h (χ^2 test for equal proportions; df=7; p<0.0001). Logistic regression analyses identified the following factors for fatal outcome: open track (v station area: adjusted OR 2.96; 95% CI 2.30 to 3.80), main railway line (v local line: adjusted OR 2.26; 95% CI 1.32 to 3.86), and male sex (v female sex: adjusted OR 2.06; 95% CI 1.60 to 2.65) as risk factors. Temporal aspects also reached statistical significance: night (v day: adjusted OR 1.66; 95% CI 1.21 to 2.26) and winter (v summer: adjusted OR 1.35; 95% CI 1.05 to 1.73). The factor age showed no significant impact.

Conclusion: It is widely acknowledged that suicides on the railway track are inappropriate to serve as ''gesture'' or ''cry for help'' because no control over the effects of the attempt is available. This is the first study to show for a particular hard suicide method that survivors compared to completers may follow a distinct behavioural pattern with differences in sex, temporal, and local aspects.

061 | SEX DIFFERENCES IN TEMPORAL VARIATIONS OF SUICIDAL BEHAVIOUR ON GERMAN RAILWAYS. AN ANALYSES OF 40 003 CASES

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Introduction: Seasonal and diurnal variations of suicidal behaviour are among the most widely established findings in suicide research. Apart from age and degree of violence of the suicide means, sex was found to influence temporal variations. Evidence on time rhythms of railway suicides as a particularly ''hard'' method of suicide, however, still is inconsistent. Our aim was, therefore, to examine sex specific time patterns of suicidal behaviour on tracks of the entire German railway net as basis of suicide preventive strategies.

Methods: Cases were derived from the national central registry of all passenger accidents on the German railway net between 1997 and 2002 satisfying the operational definition of suicidal behaviour and including information on sex, age, date, clock time, and outcome of the incidence. Statistical associations between categorised variables were assessed by the χ^2 test for association. Monthly and diurnal variations were carried out with the χ^2 test for equal proportions. Odds ratios were estimated using regression analysis models. Amplitude of the monthly variations in suicides was given as the peak's percentage above the mean.

Results: During the 6 year observation period 5731 suicidal acts were registered. Among them, sex was documented for 4003 suicide victims. Male to female ratio was 2.70:1 (p<0.001). The female subgroup was significantly older than the male subgroup (p<0.001). The monthly

distribution revealed a bimodal pattern, particularly in men younger than 65 years, with a seasonal excess risk in April and September. The significant circannual pattern, however, attenuated in the second half of the observation period. Monday and Tuesday proved to be high risk days for both sexes. For males, the highest incidence was between >18:00 and 21:00 h; in contrast, female suicides occurred significantly more often during daytime and peaked between >9.00 and 12.00 h. A seasonal variation of the diurnal pattern was found with a bimodal distribution in the winter half year (peaks: >6.00–9.00 h and >18.00–21.00 h) and a unimodal distribution in the summer half year (peak: >21.00–24.00 h). Stratification by sex revealed that, at variance with males, females exhibited solely a morning peak (>9.00–12.00 h) in the summer half year. For both sexes, a substantially wider time window of suicide events with a 3 h shift towards earlier morning hours and correspondingly a 3 h shift towards later evening hours was observed in the summer months.

Conclusion: The analysis revealed marked weekly and diurnal peaks of railway suicide intensity with a seasonal modulation of circadian rhythms. Differences between men and women in time patterns indicate sex specific processes underlying their suicidal behaviour. The findings may increase alertness of railway and security personel for particular vulnerable time windows of excess risk for railway suicides.

062 HOSPITALISATION AMONG INJURED CHILDREN IN ROAD TRAFFIC AND HOME ACCIDENTS: SIMILARITIES AND DIFFERENCES

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Introduction: In the Lazio region, the 3.4% and the 2.4% of children, in 2000, were admitted to the emergency departments (ED) for accidents occurred at home and on the road, respectively.

Objective: The aim of this study is to compare individual and environmental factors associated with hospitalisation consequent to ED admission, among injured children in road traffic and home accidents.

Data source: Pilot road traffic and home surveillance systems, based on the integration between the emergency information system, the hospital information system, and the mortality registry of Lazio region.

Population: All the ED admissions of children, aged 0–18 years.

Methods: Logistic regression has been performed to compare the probability of hospitalisation for different individual and environmental factors. Separate models for four age groups (0 years, 1–5, 6–13, and 14–18) and for place of injury have been performed, to take into account the interaction between these two factors (p<0.0001). Models have been adjusted for the triage code (very urgent, urgent, not urgent, and not appropriate) as a proxy of severity.

Results: The hospitalisation rates are 194 and 219 per 100 000 for home and road, respectively. The highest hospitalisation rate has been found for the teenagers on the road (528/100 000) and for the infants at home (713/100 000). Higher probability of hospitalisation has been found for children living outside of the city of Rome in comparison with the urban children, especially for infants for road traffic accidents (OR 4.27; 95% CI 1.60 to 11.4), and for home accidents (OR 1.78; 95% CI 1.38 to 2.29). Hospitalisation is higher during the warm seasons in comparison to winter, and is less frequent during the day (2pm–7pm v 8pm–6am) (OR 0.80; 95% CI 0.69 to 0.92) for road traffic accidents. Probability of hospitalisation is higher during the weekend (OR 1.16; 95% CI 1.02 to 1.31) and among males (OR 1.34; 95% CI 1.17 to 1.52) only for teenagers involved in road traffic accidents.

Conclusions: This analysis highlights differences between road and home accident hospitalisation risk. The ages at risk are different; road accidents involve teenagers and seem to be more associated to behavioural risk factors, while domestic injuries principally involve infants. This study identifies children living in non-urban area as high risk children, either for road or for home accident hospitalisation.

063 DIFFERENT DEFINITIONS OF HOME ACCIDENT MORTALITY: A SENSITIVITY ANALYSIS

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Introduction: To date, no commonly accepted definition of home accident (HA) mortality has been proposed.

Objective: Aim of this study is to evaluate the capability to capture the major number of death cases of different criteria.

Methods: HA data come from a pilot surveillance of all the HA occurring in Lazio Region, Italy 2000. The surveillance is integration between the emergency department information system (EIS), the

hospital information system (HIS), and the mortality registry (MR). The gold standard definition of HA mortality in this study was obtained through an analysis of the hospitalisation story and of death certificates, using the following criteria: all the deaths, reported in the MR, occurred the same day of the discharge from the emergency department (ED) or hospital; all the deaths for which a trauma/poisoning cause of death (ICD: 800–998.1 and all the E codes, excluding transport, 800–848; and violence, 950–999) present in the MR, for which the cause of death was the same of the diagnosis reported in the EIS-HIS database, and the time span was admissible. Three definitions of HA mortality have been tested: (1) inhospital mortality (IHM); (2) mortality within 30 days from the ED admission or hospital discharge (M30d); and (3) mortality for a trauma/poisoning death cause (ICD: 800–998.1, and all the E codes, excluding transport, 800–848; and violence, 950–999) (TPM). A sensitivity analysis has been proposed to evaluate the mortality outcome, comparing the death cases in our database with the criteria proposed.

Results: The database reports 145 101 episodes of HA (2.7% of the entire population) and an hospitalisation rate equal to (8% of the episodes). The total number of deaths among the subjects present in this surveillance and found in the MR or in the EIS-HIS database was 1321, while the number of HA deaths was 387 and a mortality rate equal to (7.3 per 100 000). Particularly high mortality rate has been found among older people (40.2 age >65 years and 83.7 per 100 000, age >75 years). The three different definitions of mortality were able to capture the following number of cases: IHM, 399 deaths, 75.5% sensitivity and 88.5% specificity; M30d, 563 deaths, 92.8% sensitivity and 78.2% specificity; and TPM, 244 deaths, 58.4% sensitivity and 98.1% specificity.

Discussion: The three definitions of mortality gave different results. M30d is the definition that better individuates the true positives but it classifies as positives also a great proportion of true negatives, while TPM is worse than M30d in identifying the true positive, but it classifies very well the true negatives. Worst results are given by the IHM.

064 RANDOMISED CONTROLLED TRIAL TO IMPROVE THE COMPLIANCE TO COLORECTAL CANCER SCREENING: THE GENERAL PRACTITIONERS CAN BE USED AS TEST PROVIDERS

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Introduction: Latium region conducted a set of pilot studies to obtain the information needed to plan a CRCS programme with an evidence-based organisation.

Objectives: To assess the effect of the provider GPs v hospital on the compliance of the population 50–74 year old in returning the FOBT. To analyse the characteristics of the GP, which are associated with high compliance among his beneficiaries.

Methods: We mailed a questionnaire about screening attitudes to 1192 GPs. We asked the GPs to participate in a randomised trial with outcome the compliance to CRCS. We sampled 10 GPs for each 13 districts where the hospital were placed: about 1/10 of the GPs' beneficiaries 50–75 year old (n = 3657) were invited to pick up and give back the FOBT at the GP surgery and 1/10 (3675) were invited to the gastroenterology centre of the nearest hospital. We tested the association between compliance and GPs' characteristics performing a logistic regression in which the GP was considered the primary sampling unit. The GPs participating in the trial have been compared with GPs not participating for the characteristics that influenced the level of compliance.

Results: 58.5% of the GPs filled the questionnaire and 22.7% agreed to participate in the trial. The compliance obtained using the GP as providers of the FOBT was 3.4 times higher than the compliance obtained using the hospital as provider (95% CI 3.13 to 3.70), independently from the type of test and the geographical area. There is a strong correlation between the compliance obtained by the GPs in the half practice population assigned to the GP's surgery arm and the compliance obtained in the half assigned to the hospital arm. We observed a high variability among GPs: GPs with more than 25 patients visited per day and those incorrectly recommending FOBT for CRCS obtained a lower compliance (OR 0.74, 95% CI 0.57 to 0.95 and OR 0.76, 95% CI 0.59 to 0.97, respectively). The GPs who participated in the trial are different from the whole population of the GPs: they are younger, more frequently male, and more likely correctly recommending the FOBT for CRCS (68% v 32%).

Conclusions: The GPs showed scarce interest in the study, probably reflecting a scarce interest to the CRCS. The GPs as providers obtained 3.4 times higher compliance, but this brilliant result was probably not extensible to the whole population of GPs. The involvement of GPs as providers of the FOBT in CRCS can be very effective to enhance the compliance, but the effectiveness is dependent on the willingness of the GP involved.

065 CORD BLOOD HAEMOGLOBIN IS POSITIVELY ASSOCIATED WITH EARLY POSTNATAL GROWTH IN PRETERM INFANTS

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Introduction: Few studies have evaluated the long term growth of preterm infants associated with iron deficiency.

Objective: This study aimed to address the role of anaemia at birth on the growth pattern of preterm infants.

Methods: We evaluated the association of cord blood haemoglobin level with growth of 96 premature babies, followed during 6 months of corrected age. For longitudinal data analysis, random regression models were used to determine the association of growth, expressed by length, with haemoglobin concentration at birth. The influence of haemoglobin on the anthropometric indexes of growth was analysed based on the temporal changes of anthropometric indexes using the PROC MIXED procedure, SAS, version 8.0 software. The term of interest was the haemoglobin by time interaction, which estimates the change rate of the outcomes. We assumed an exchangeable covariance structure of the models (compound symmetry), and models with random intercept and random slope were tested by the likelihood ratio test.

Results: The rate of growth of those children above median (12.6 cm) of cord haemoglobin was greater than the growth rate among infants below median (10.6 cm). The growth rate was even greater for those infants with values of cord insulin above median (13.5 cm and 11.4 cm, respectively). Interactions with sex were not statistically significant (p = 0.35), indicating that boys and girls showed the same growth pattern. Modelling the growth with a random intercept showed that birth weight was positively associated with length (p = 0.001) and the associations with other confounding variables were not statistically significant in the model. Models with haematocrit instead of haemoglobin showed about the same results.

Conclusion: Even after controlling for gestational age and birth weight, our data indicate that iron status at birth has an important role in the growth pattern of preterm infants, which is independent of the insulin level, but modified by the level of cord insulin.

066 EXPLORING THE RELATIONS BETWEEN CHILD MORTALITY AND SOCIOECONOMIC FACTORS IN THE NORTHEAST REGION OF BRAZIL

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Objectives: The purpose of this work is to explore the relations between infant mortality, precisely for children below 5 years of age, and socioeconomic factors in the states of the northeast region of Brazil, taking the respective counties as unit of analysis.

Methods: To achieve this goal, a multiple regression model was adjusted, in order to identify the socioeconomic factors (independent variables) that explain the mortality over the referred infant population (response variable) in the Northeast region of Brazil, based on data available on the Human Development Atlas of Brazil (PNUD/IPEA/FJP, 2003), updated by the data from the IBGE 2000 Census. The Average per capita Household Income (RENDPC), the analphabetic rate of the adult population 15 or more years of age (TXALFA), and the proportion of the population living in households with sanitary facilities (PPSAN), were selected as independent or explanatory variables and the mortality rate for children below 5 years of age was taken as dependent or response variable.

Results: These indicators were collected for the 1787 counties of the northeast region, identifying, when convenient, their correspondent states. The adjusted model for the region total reveals, as statistically significant explanatory variables (p <0.05), the variables PPSAN, responsible for 44% of total variation and TXALFA, responsible, after the introduction of PPSAN in the model, for more 3.3% of total variation, completing the 47.4% of explained variation for the model. The variable RENDPC does not give a statistically significant contribution to the model. It is interesting to observe that, in the absence of the variable PPSAN, the resulting adjusted model reveals the variables TXALFA and RENDPC as statistically significant to explain the infant mortality, where TXALFA is responsible for 42.1%, and RENDPC is responsible for the remaining of the 42.8% of the total variation explained by this model, that is, only 0.7%, showing the low explaining power of the income over the infant mortality in presence of education. The adjusted model for each state of the considered region reveals that, only for the states of Rio

Grande do Norte and Bahia, the variable PPSAN presented a higher explaining power for the response variable M52000 than the variable TXALFA. For the state of Rio Grande do Norte, the education factor shows a higher power than the income factor, in the absence of the sanitary facilities, and just the inverse for the state of Bahia. For the remaining states, the variable TXALFA appears to be the one with best explaining power for the response variable M52000.

Conclusions: The results giving evidence of the importance of the education factor over the infant survival, pointing out, clearly, that the social area needs to be centred as a focus of investments on this suffered Brazilian region.

067 ANAEMIA AS A RISK FACTOR FOR INFECTIOUS DISEASES IN INFANTS AND TODDLERS: RESULTS FROM A PROSPECTIVE STUDY

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Introduction: Anaemia in the form of iron deficiency anaemia is the most prevalent form of micronutrient malnutrition in the world; however, the causal relationship between anaemia and infection remains unclear due to the complex interactions between morbidity, anaemia, and family and environmental factors.

Objectives: To examine the causal association between anaemia and infection among Bedouin infants.

Methods: Families of 239 infants from a Bedouin Arab township were recruited at birth during the periods of 1989–92 and 1994–97. Infants were followed from birth to age 18 months. The numbers of diarrhoea and respiratory disease episodes as well as total number of days of diarrhoea were ascertained weekly. Haemoglobin levels were obtained at age 6 months. Additional data on feeding practices, environmental, household, and demographic characteristics were obtained throughout the 18 months of follow up.

Results: Diarrhoea before 6 months of age was a risk factor for diarrhoea after that age. When examining the association between anaemia (Hb<11 g/dL) at 6 months and infectious disease morbidity after that age we found that anaemia was an independent risk factor for diarrhoea and respiratory illness which occurred from 7–18 months of age, even after controlling for morbidity up to age 6 months. Furthermore, the independent associations between anaemia and infectious diseases remained significant after controlling, in addition to prior morbidity, for other environmental and socioeconomic factors. In the multivariable logistic regression models, which included the environmental and socioeconomic factors as well as diarrhoea prior to age 6 months, anaemia increased the risk for infection after that age as follows: for diarrhoea the increased risk was 2.9-fold (95% CI 1.6 to 5.3; p<0.01) and for respiratory disease it was twofold (1.1 to 3.6; p = 0.03).

Conclusion: Our findings suggest that anaemia at age 6 months may be an independent risk factor for infectious disease morbidity after that age. This highlights the importance and potential impact of reducing anaemia in infants as a preventive measure to lower disease burden from infectious disease in this and other vulnerable populations.

068 KNOWLEDGE, OPINIONS, AND BEHAVIOURS OF A COLLEGE POPULATION FACED WITH AIDS (UNIVERSITY OF MINHO AND CALOUSTE GULBENKIAN NURSING SCHOOL OF BRAGA CITY)

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In Portugal the epidemic of AIDS continues to grow at a worrying rate. According to UNAIDS there are 50 000 cases of persons infected with HIV. This study identified the level of knowledge, source of information, opinions, and behaviours referred, of the students from the University of Minho faced with AIDS, and identified differences between the students of health courses (health) and those from different areas of education (other). This study is a descriptive study. A questionnaire was sent to a college population sample of 312 from the 8829 students at the University of Minho. Based on the sample, it is estimated that 30% use condoms (p = 0.05, CI 95%). A random stratified selection was used. There was a 78% response rate and these were divided into the two groups; health and other. The more important information comes from the press and television and the individuals who considered they had ''good'' knowledge thought that information about AIDS should be provided by health services. There is a higher level of knowledge about

AIDS in individuals from health courses compared with those from other courses (p = 0.006). The students have decreased ''perception of vulnerability'' to AIDS, and this is lower among the students on other courses (p = 0.000). The majority of the individuals answered that they did not feel embarrassed buying condoms; however, this was 80% for males but only 53% for females. 90.7% answered that they would be happy to have an AIDS test, however, barely 45% of them know where they could have the test. 63.4% considered their knowledge about AIDS has an impact on their behaviour and sexual practices; 15.9% assume they have risky sexual behaviours; 17.8% had more than one sexual companion in the past year (of these, 18.4% referred to have occasional sexual meetings). 25.9% referred to have sexual relations under the effect of alcohol; of those, 76.6% said this was without condom use. Apparently it verified that quality on the information about AIDS is better than that transmitted to previous college students.

069 SOCIAL INEQUALITIES IN BIRTH—FACTORS ASSOCIATED WITH CAESAREAN SECTIONS AMONG PRIMIPARAE IN BRAZIL

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Introduction: Brazil has one of the highest rates of caesarean sections in the world and, in spite of definite regional differences in their magnitude; the increase has been a nationwide phenomenon. The risks and safety of caesarean birth differ from place to place in the world and it has been postulated that as the relative safety of the procedure is an important factor contributing to the rise of caesarean birth, the fact that this has only been achieved in some parts of the world should restrict the indications to perform the operation in the best interests of pregnant women.

Objective: This study was conducted to investigate the effect of social inequalities in caesarean section rates in primiparous women in southern Brazil.

Methods: Annual rates and odds ratios (OR) of caesarean sections among primiparae with single pregnancy and delivering in maternities in the southern Brazilian state of Rio Grande do Sul were estimated for social factors (maternal age and education, skin colour/ethnicity of the newborn, and macro-regions of the health services administration) for post-term delivery, applying unconditional logistic regression on data from the National System of Information on Live Births (SINASC) in 1996, 1998 and 2000.

Results: There were about 180 000 live births per year; 99% in maternities, a third among primiparae. The caesarean section rate was 45%, >37% in all macro-regions. The caesarean section rates increased in most regions in women >30 years, >6 antenatal consultations, brown skin colour, and native Brazilian Indians. Unadjusted and adjusted OR were positively associated with maternal education and age, and white skin colour of the newborn and post-term delivery. These effects were partly mediated by the greater number of antenatal consultations among these women, which have also shown a positive effect on the rates of caesarean sections.

Conclusions: Socioeconomic conditions and differences in use and access to medical technology in Brazil are striking when comparing different regions inside the country. In this context, while distance to medical facilities and lack of means of transport can prevent many women in labour (living in rural settings or in the periphery of metropolitan areas) from access to caesarean section as a life saving procedure, at the same time in urban and central areas of the main cities overuse of caesarean section is the rule. High rates of caesarean sections in southern Brazil are a public health problem beyond the scope of clinical matters. Regional differences in rates of caesarean section are likely to be the consequence of a number of factors operating together, including social, economic, and cultural factors that determine misuse of medical technology during labour and delivery.

070 BUILDING THE HIERARCHICAL MODEL OF FACTORS INFLUENCING TYPE OF DELIVERY IN SOUTH BRAZIL

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Introduction: Caesarean section is an essential component of good obstetric practice. Used when specific medical indications occur, it can save the lives of mother and baby. In Brazil, rates of caesarean sections

are well above those that can be attributed to absolute medical indications. The totality of non-medical issues surrounding birth in Brazil, including personal and institutional factors from women's and obstetricians' contexts have been reported to as the ''culture of caesarean sections in Brazil''. These factors can range from psychological character of the women, their interaction with the healthcare system, and the organisation of obstetric practice. A cross sectional study of 330 recently delivering women, followed by interviews with the obstetrician in charge of the delivery and information from admission and delivery books, was conducted in the main public maternity section in Florianópolis, South Brazil, to investigate how medical staff, women, and the organisation of obstetric practice interact to influence decisions towards caesarean sections.

Methods: Information from interviews with women included factors influencing labour and outcome of delivery from the perspective of these women, their experiences during pregnancy, contact with antenatal services, and other women's experiences. Also, their experiences during labour and delivery and their interactions with obstetric staff in the maternity ward were addressed as part of the postpartum survey. From the obstetrician perspective, data concerning medical and non-medical factors influencing development of labour was collected. This included decisions concerning type of delivery among these women, timing and use of interventions, labour development, and decisions concerning type of delivery. Methods of multivariate analysis where used to create the hierarchical model of factors influencing delivery by caesarean. The main principle underlying hierarchical regression modelling is that the selection of the exposure variables is not based purely on statistical associations, but also on a conceptual framework describing the logical or theoretical relationships between the potential determinant factors.

Results: The risk factors found to present the largest odds ratios were previous caesarean section (OR = 10.7; p<0.01), previous experience favouring caesarean (OR = 3.6; p<0.01), antenatal care with the on-duty doctor (OR = 4.0; p<0.01), being admitted not in labour (OR = 37.6; p<0.01), and adverse events in labour (OR = 4.0; p<0.01).

Conclusions: Although obstetricians are clearly key players in deciding for caesarean sections, where medical indications are not absolute, the situation is more complex and factors from women's and obstetricians' contexts including personal, institutional, and non-medical issues can operate to influence decisions towards type of delivery. The understanding of the high rates of caesarean section in Brazil, from its multifactorial perspective, can be seen as an essential requirement, before potential interventions to reduce the excessive rates can be devised, developed, and evaluated.

071 NEEDS OF REFUGEE MOTHERS AFTER PREGNANCY— EARLY RESPONSE SERVICES (NORMAP-ERS): AN EXAMPLE OF SCIENTIFIC CHALLENGES IN STUDIES OF MIGRATION

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Introduction: A steady flow of refugees and asylum seekers arrive in industrialised countries every year. Compared with immigrants who leave their country by choice, these newcomers are at an increased risk of several determinants of ill health including poor nutritional status, reduced social support, and histories of abuse. Asylum seekers may also experience anxiety and stress directly related to their precarious immigration status. Childbearing further increases the vulnerability of female refugees and asylum-seekers, by placing these women in a position of needing additional health services and social support during pregnancy, childbirth, and postpartum. No studies in Canada (and very few in other industrialised countries) have reported the prevalence of harmful health events or outcomes in childbearing refugee and asylum seeking women. To address this gap in knowledge, a Canadian wide study is being conducted to determine the health and social care needs of these women and their infants and whether or not these needs are being met by the current health and social service system.

In the context of this study, a number of scientific challenges on conducting studies in migration were identified. The goal of this paper is to describe these challenges and to discuss solutions in overcoming the complexities that present when studying this vulnerable population.

Methods: 150 women and infant pairs in each of the following groups: refugee, asylum seeker, non-refugee immigrant, and Canadian born women (n = 600), are being recruited across 12 hospital centres in three major Canadian cities (Montreal, Toronto, and Vancouver). Registered nurses make home visits at 1 week post-birth to assess the families (through the use of a standardised assessment protocol and translated questionnaires) for health and psychosocial concerns and to determine care received/planned at that time.

Results: Three significant challenges emerged in conducting this study. Firstly, sample selection (ensuring the study population is representative of the ''target'' poulation): (a) defining eligibility criteria and ''exposure'' categories (that is the independent variable, migration history); (b) determining recruitment sites; (c) applying eligibility criteria (while ensuring ethical protection of subjects and given budget limitations); and (d) confirming complete ascertainment of study sample. Secondly, unbiased measurement in several languages: (a) eliciting migration history and other information; and (b) defining outcome criteria and operationalising assessment. And thirdly, unbiased analyses: (a) loss of subjects over the course of the study; (b) recruitment rate differences by migration history and city.

Conclusion: To overcome these challenges the following is required: a high level of commitment to answering the research questions; patience with your own learning curve; and teaching reviewers and others about this field; ''thinking'' time, money, and strong support staff.

Recognising the challenges and options for resolving them leads to: stronger study designs; greater efficiency (obtaining a valid answer at reduced costs); and ultimately optimising the health of newcomers.

072 DIETARY HABITS AND STOMACH CANCER IN POLAND

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Introduction: Diet is assessed as one of the most important preventable causes of cancers. There is no clear relationship, but what kind of micronutrients play an important protective role in cancer development? The association between nutrient intake and the risk of stomach cancer was assessed in a hospital based case-control study in Poland.

Methods: Material covers 190 histologically confirmed cancer cases (mean: 57.1 years) and 548 controls (57.4 years). Information about frequency and quantity of consumption of 174 alimentary items was gathered by questionnaire (1 year dietary recall, 5 years prior to diagnosis). Comparisons of daily intake have been performed using Mann-Whitney test and logistic regression model.

Results: In the cancer group a lower average daily intake (in comparison with controls) of carotene (1.21 mg v 1.32 mg; p=0.004), vitamin E (4.24 mg v 4.44 mg; p=0.005), vitamin C (39.87 mg v 42.97 mg; p=0.032), phosphorus (0.75 mg v 0.78 mg; p=0.024), iron (6.31 mg v 6.61 mg; p=0.000), fibre (2.0 g v 2.1 g; p=0.008), and linoleic acid (4.2 mg v 4.4 mg; p=0.004) was observed, and higher intake of alcohol (2.1 g v 1.5 g; p=0.006) and cholesterol (198.3 mg v 191.4 mg; p=0.028). The subjects of the study were subsequently categorised by daily consumption of nutrient items by quartiles. Low quartile of daily intake in the control group was defined as the low level of consumption. The lower stomach cancer risk was found in cases with low daily intake of energy (OR=0.63; 95% CI 0.40 to 0.98). After adjustment for energy, age, sex, martial status, and place of birth the higher risk was found in the group of lower intake of carotene (OR=1.56; 95% CI 1.07 to 2.27), vitamin C (OR=1.46; 95% CI 1.01 to 2.12), fibre (OR=1.51; 95% CI 1.03 to 2.20), and iron (OR=1.99; 95% CI 1.39 to 2.85). Lower intake of alcohol decreases the risk of stomach cancer in our study (OR=0.62; 95% CI 0.40 to 0.98).

Conclusions: The results of the present study indicated that vitamins (especially carotene and vitamin C) and fibre might have protective effect against stomach cancer, moreover, low consumption of alcohol may decrease the risk of cancer.

073 INJURIES AND POISONINGS IN ELDERLY PATIENTS IN POLAND

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Introduction: Approximately 50% of world's injury related deaths occur in young people aged 15–44. Despite that, the injury related mortality rates, in all regions all over the world, increase respective to age.

Objective: The objective is to identify the main reasons for hospitalisation caused by injuries and poisonings in the group of people aged 65+ years living in Poland.

Material and Methods: The data on all hospitalised cases (100%) in 2001, in four regions of Poland were analysed. The hospitalisation rates by causes were evaluated in the group of 1 470 664 cases. 29% of that number constituted elderly patients (65+). The problem of injuries and poisonings that caused hospitalisation of persons aged ⩾65 is presented.

Results: In four selected regions of Poland, 132 646 patients were hospitalised due to injury or poisoning in 2001. The cases of injuries and poisonings constituted 9% of all hospitalisations. In all hospitalised cases of injuries and poisonings, there was 16% of elderly people and 20% people aged 20–34. The higher hospitalisation rate caused by injuries and poisonings was observed in the group of elderly patients, living in cities 150/100 000 v 119/100 000 in general population and 149/100 000 in the group of people 15–19 years old. Younger men living in cities were admitted to hospitals due to injuries and poisonings more often than men ⩾65 years old (rate: 161/100 000 v 141/100 000). For men (65+) living in rural area, the hospitalisation rate caused by injuries and poisonings was higher than for men living in urban areas (151/100 000 v 134/100 000). The hospitalisation rate for elderly women was higher than in general population (156/100 000 v 150/100 000) and especially high for women living in rural areas (192/100 000). The main causes of hospitalisation due to injuries and poisonings in the group of elderly patients were following fracture of the femur (43/100 000; five times higher rate than in general population) and complications of orthopaedic procedures (1.8/100 000). For elderly patients fractures of the thigh (43/100 000), lower leg and knee (12/100 000), forearm (9/100 000), and lumbar vertebrae with hip (7/100 000) were the most typical.

Summary: Elderly women living in rural areas are exposed to a high risk of injuries and poisonings. Injuries are predominant in that large group of injuries and poisonings. The most common injury suffered by elderly patients was fractures of lower extremities.

074 ALPHA OMEGA TRIAL: RESULTS FROM THE PILOT STUDY

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Introduction: Whether dietary omega-3 polyunsaturated fatty acids are causally related to cardiovascular disease is a major, unresolved question in preventive cardiology. Essential omega-3 fatty acids are eicosapentaenoic acid (EPA; C20: 5,n-3) and docosahexaenoic acid (DHA; C22: 6,n-3), and their parent compound alpha-linolenic acid (ALA; C18:3,n-3). Evidence is accumulating that EPA-DHA reduce the risk of cardiac arrhythmia and sudden cardiac death in humans.

Methods: The Alpha Omega Trial is a multicentre placebo controlled, double blind intervention study in post myocardial infarction patients to examine the effect of low doses of omega-3 fatty acids on coronary heart disease mortality. The trial includes 4000 men and women aged 60–80 years who had a clinical diagnosis of myocardial infarction in the past 10 years. The trial has a 2×2 factorial design with random assignment of equal numbers of patients to one of four interventions: 1) 400 mg/day of EPA-DHA; 2) 2 g/day of ALA; 3) both EPA-DHA and ALA; or 4) placebo. Omega-3 fatty acids are supplied via enriched margarine for a period of 3 years. The trial started in May 2002. Funding has been obtained from the Netherlands Heart Foundation (topdown programme 2000T401).

Results: A pilot study was conducted in the first 400 participants (25% women, mean age of 69 (SD 6) years) who were re-examined after 3 months of intervention. Fatty acid composition of plasma cholesteryl esters indicated good compliance, with 3 month increases in ALA in two groups (by +35% and +29%; p<0.001) and 3 month increases in EPA in two groups (by +40% and +33%; p=0.004). Changes in subjective health, blood glucose, blood pressure, heart rate, and body weight were similar in all groups. There was no significant treatment effect on serum total cholesterol (p=0.50), HDL-cholesterol (p=0.71), LDL-cholesterol (p=0.19), or triglycerides (p=0.38). Seven patients dropped out and 2 died during the first 3 months of intervention.

Conclusion: The Alpha Omega Trial is safe and feasible. Final results are expected in the year 2008.

075 RANDOMISED CONTROLLED TRIAL TO IMPROVE COMPLIANCE TO COLORECTAL CANCER SCREENING: IMMUNOCHEMICAL FAECAL OCCULT BLOOD TEST IS BETTER THAN GUAIACO TEST

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Introduction: Latium region conducted a randomised trial to obtain the information needed to plan a colorectal cancer screening (CRCS) programme with an evidence based organisation.

Aim: To assess the effect of the type of faecal occult blood test (FOBT), Guaiaco *v* immunochemical, on the compliance to screening of the 50–74 year old population. Other logistical and organisational aspects of the two screening test have also been analysed.

Methods: We sampled 130 GPs who gave the consent to participate to a randomised trial with outcome the compliance to CRCS. We randomised one half of the GPs to the Guaiaco arm and half to the immunochemical arm. We sampled 2/10 of the GPs' beneficiaries 50–75 year old (n 7332), we randomise this population in two halves, one invited to pick up and give back the FOBT at the GP surgery and the second invited to the gastroenterology centre of the nearest hospital. We considered the percentage of returned tests as the principal outcome, the interval confidence of the relative risk takes into account the cluster randomisation. We also compared the prevalence and the variability among zones of positive and inadequate tests in the two arms.

Results: The immunochemical test had a compliance of 36.5% and the Guaiaco of 30.6%, RR of 1.22 (95% CI 1.02 to 1.46). The difference is completely due to a higher probability of returning the test and not to the picking up: 93.8% and 88.6% of returning the test given the picking up for immunochemical and Guaiaco, respectively (RR 1.06, 95% CI 1.02 to 1.10). The Guaiaco test has a higher prevalence of positives (10.3% *v* 6.3%, RR 0.603; 95% CI 0.433 to 0.837). The difference is mostly due to the results of three centres very high prevalence: 32%, 27%, and 26%. There is no difference in the mean prevalence between the two providers, GPs and the gastroenterology centre. There is a higher variability in the results obtained with the Guaiaco test compared with the immunochemical (F(1,12) =16.25; p=0.0017). The Guaiaco test had a higher proportion of inadequate samples, compared with immunochemical: 2.1% *v* 1.1%, this difference is not significant, taking into account the variability among GPs and districts (OR 1.94; 95% CI 0.80 to 4.71).

Conclusions: The immunochemical test enhances the compliance to CRCS comparing to Guaiaco, independently from the provider. The prevalence of positive tests with Guaiaco, in our setting show a higher variability. In the implementation of a screening programme it important to consider a period of standardisation of the test reading in order to avoid unexpected work overload to the second level colonscopy services.

076 COMPARISON OF A SELF-ADMINISTRATED QUESTIONNAIRE AND AN INTERACTIVE SOFTWARE FOR ASSESSMENT OF FRUIT AND VEGETABLE INTAKE IN ADOLESCENTS

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Introduction: Based on the evidence that consumption of fruits and vegetables plays an important role in the prevention of chronic disease, the international recommendations include the goal of increasing consumption to five or more servings per day. Methods used to assess intake are often laborious and unattractive, particularly in children and adolescents, to whom the evaluation is especially important for promoting consumption. This study aimed to develop interactive software to evaluate adolescents' fruit and vegetable consumption and compare it with a traditional food frequency questionnaire.

Methods: The program was developed in Visual Basic 6.0 and the answers were saved in a Microsoft Access database. The program was designed to estimate fruit and vegetables intake and also to supply nutrition information according to the ''5 a day'' healthy eating message, so that healthy individual choices can be promoted. Among 70 adolescents, aged 14–17 years, consumption of fruits and vegetables was evaluated using firstly a self-administered food frequency questionnaire, comprising questions assessing fruit (fruit, juice fruit) and vegetables (salads and cooked vegetables, vegetables soup), which estimates dietary intake over the previous week. Half an hour after they answered, again using interactive software that estimates dietary intake in the same period of time, we compared the prevalence of adolescents consuming five or more servings per day of fruits and vegetables and the separate prevalence of fruits (⩾3/day) and vegetables (⩾2/day)

obtained from both methods using χ^2 test or exact Fisher test. Kappa coefficients were calculated to evaluate the agreement between methods.

Results: The prevalence of five or more fruits and vegetables servings consumption was 14.3% (95% CI 7.1 to 24.7) using the questionnaire and 12.9% (95% CI 6.1 to 23.0) using the software. Also, the prevalence of fruits and vegetables separately was respectively 24.3% (95% CI 14.8 to 36.0) and 8.6% (95% CI 3.2 to 17.7) using the questionnaire; 22.9% (95% CI 13.7 to 34.4) and 11.4% (95% CI 5.1 to 21.3) using the software. For total consumption of fruits and vegetables and for them separately the kappa coefficients were 0.09, 0.33, and 0.21, respectively.

Conclusions: The crude prevalence of consumption of fruits and vegetables was low but similar according to both methods. However, there was poor agreement between rating approaches that need further explanation.

077 SOCIODEMOGRAPHIC AND LIFESTYLE DETERMINANTS OF BIRTH WEIGHT IN NORTH WEST RUSSIA

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Introduction: The importance of adequate antenatal development on future health is widely recognised. Birth weight (BW) is a strong predictor of infant mortality and morbidity in childhood. Moreover, compromised fetal growth is associated with increased risks of cardiovascular diseases and diabetes in adults. Socioeconomic disparities in BW exist in various settings. The rapid transition to a market economy considerably increased financial and social inequalities in Russia. This study quantifies the effects of sociodemographic and lifestyle factors on BW in a town of Severodvinsk.

Methods: Altogether, 1599 pregnant women (>99% of all pregnant women in the town in 1999) were enrolled in a cohort from 1 January to 31 December 1999. They were followed through delivery. Sociodemographic (maternal age, education, marital status, occupation, parity, weight, timing of prenatal care initiation, infant's sex, and BW) and lifestyle (smoking and drinking habits for both partners, housing conditions, type of housing, family structure, and psychosocial stress) characteristics were obtained from the medical files and a questionnaire. After excluding women who had abortions (n=77), twins (n=11), stillbirths (n=5), and women lost during follow up (n=67) after registration, the analysis was based on 1399 women and their live infants. Multiple linear regression was applied to estimate independent effect of the studied factors on the BW. Adjustment for gestational age was made to reflect fetal growth rather than duration of gestation.

Results: When only sociodemographic characteristics were included in the model, a clear gradient of BW in relation to maternal education (ME) was found. Babies of mothers with basic, secondary, and vocational education were 207 g (95% CI 55 to 358), 172 g (95% CI 91 to 253), and 83 g (95% CI 9 to 163) lighter than the babies of mothers with university education after adjustment for other sociodemographic factors.

When all the factors were incorporated in the model (R²=0.42), maternal smoking, living in shared apartments, living in crowded housing situations, and psychosocial stress were significantly associated with BW loss on 126 g (95% CI 54 to 198), 89 g (25 to 153), 82 g (28 to 136), and 61 g (7 to 116), respectively, compared with the reference groups. Moreover, the associations between BW and ME remained significant in this model.

Conclusions: Observed social variations in BW (by ME) are larger than those previously reported from other European countries. In the light of the fetal origins hypothesis, future variations in adult health in Russia might also be at stake. Maternal smoking, stress, and poor housing conditions are important determinants of fetal growth in transitional Russia. Social variations in pregnancy outcomes should be monitored to ensure that all parts of the society benefit from on going economic and social reforms.

078 PHYSICAL ACTIVITY AND QUALITY OF LIFE IN THE OLDER ADULT POPULATION OF SPAIN

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Background and Objective: This study examined the relationship between leisure time physical activity (LTPA) and health related quality of life (HRQL) in the older adult population of Spain.

Methods: Household cross sectional survey on 3066 subjects representative of the non-institutionalised Spanish population aged 60 years and over. Data on LTPA were obtained with a structured questionnaire and HRQL was measured with the SF-36 instrument. Analyses were done through linear regression, where the dependent variable was each of the eight scales of the SF-36 and the main independent variable was LPTA. Analyses were adjusted for sociodemographic and social network variables, health habits, health services use, and chronic diseases.

Results: A total of 42.7% subjects had a sedentary activity, 54.2% light LTPA, and 3% moderate/intense LTPA. As compared with sedentary activity, light LTPA was associated with a higher score in all SF-36 scales, except for physical role and emotional role, among men and women. For subjects with light LTPA the increase in score was over 3 points in most SF scales, which is usually considered as a clinically relevant change in HRQL. Results did not vary materially by age, level of education, obesity, or chronic disease. The higher LTPA the better HRQL (p for linear trend <0.05 in most scales of the SF-36 questionnaire).

Conclusions: Light LTPA is associated with better HRQL than sedentary activity. Because this association did not change with age, level of education, obesity, or chronic disease, it is suggested that older adults could improve their HRQL with, at least, light LTPA.

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079 **UNDERSTANDING THE COMPLEXITIES OF BREASTFEEDING BEHAVIOUR: RATES AND SHIFTS IN PATTERNS DURING THE FIRST SIX MONTHS OF LIFE IN THE MONTÉRÉGIE REGION, QUÉBEC**

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Introduction: Lack of uniformity in defining breastfeeding and the recognition of the dose-response phenomenon related to the benefits it confers has emphasised the importance of using internationally recognised definitions and classifications and of reporting separately breastfeeding categories and patterns over time. The study objective was to measure breastfeeding rates and patterns during the first 6 months of life in the Monteregie region using the WHO international definitions.

Methods: Telephone survey with a representative sample of women with 6 month old infants residing in the Monteregie, the second largest socio-sanitary region in the Province of Quebec, Canada.

Results: Among 632 participants, 80% initiated breastfeeding but only 68% exclusively breastfed (breast milk only) their babies during the first 24 h after birth. Regarding breastfeeding patterns, at 1 month, less than two thirds of breastfeeding women were exclusively breastfeeding since birth; by 4 months, only one third of breastfeeding women were exclusively breastfeeding since birth and by 6 months, it was almost non-existent. The proportion of women predominantly breastfeeding (breast milk plus water, water based liquids, or juice) since birth is very small at all periods (between 2 and 6%), whereas the proportion of women giving complementary feeds (breast milk plus non-human milk or solids) since birth increases as the proportion of exclusive breastfeeding diminishes.

Conclusions: The rapid drop in exclusive breastfeeding indicates a need for improvement in order to comply with the current recommendations of feeding babies only breast milk for the first 6 months of life. The most likely types of food to break breast milk exclusivity in the first months of life are primarily non-human milk or solids, resulting in a shift from exclusive breastfeeding to complementary breastfeeding without passing through predominant breastfeeding. This pattern is different from the one described in certain European studies were predominant breastfeeding is a more frequently observed feeding behaviour. The earlier introduction of non-human milk in breastfed infants may represent culturally based differences in infant feeding practices between North America and Europe. Because the introduction of non-human milk in the first months of life is usually intended to replace breast milk, it may also represent a marker of unresolved difficulties and premature weaning, consistent with the lower breastfeeding rates during the first year of life documented in North American studies. A high rate of complementary breastfeeding, combined with a lack of knowledge and a non compliance with most international, national and provincial breastfeeding recommendations, will require important efforts and multiple strategies in order to increase the initiation and the duration of exclusive breastfeeding in the region and assure that Monteregie babies receive optimal nutrition during the first 6 months of life.

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080 **USE OF AN INFORMATISED TOOL TO MEASURE EVIDENCE-BASED MATERNITY CARE POLICIES AND PRACTICES IN A HOSPITAL SETTING**

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Introduction: The launching of the WHO/UNICEF Baby Friendly Hospital Initiative (BFHI) in 1991 has encouraged the adoption of evidence-based policy and practices by maternity care units around the world. The Monteregie Breastfeeding Regional Program has chosen the BFHI as its main strategy to increase breastfeeding (BF) initiation, duration and exclusivity in the region. In order to diagnose in the planning stage baseline organisational behaviour regarding the initiative's proposed policies and practices, a first assessment of the BFHI implementation level in each of the Monteregie hospitals was performed in 2001. However, diffusion of the results to hospital administrators and staff was slowed down by the usual time consuming tasks of data analysis and preparation of personalised reports for each participating institution. With programme ongoing activities being carried out at both the regional and local level, an evaluative monitoring of the BFHI implementation level is planned every 3 years, the first follow up study scheduled for March to April 2004. The objective of this study is therefore to perform a second measure of the BFHI implementation level in each of the Monteregie hospitals using an informatised tool that assures timely feedback of results to hospital administrators and staff.

Methods: The study examines the implementation level of policies and practices, recommended by the BFHI's Ten steps to successful BF and International code of marketing of breastmilk substitutes, in all nine hospitals offering obstetrical care in the region. Using as data sources for each hospital the perspective of mothers (n = 25), professionals (n = 10), and external observers (n = 2), 3 to 14 indicators were measured for each step and some of the code's articles. In order to provide hospitals with a summary measure, two synthetic indexes were constructed: the ten steps implementation score ranging between 0 and 10 and the code implementation score ranging between 0 and 5.

Results: A demonstration of the use of the informatised tool will be done. Preliminary results of the 2004 study will be presented and compared with the data collected in 2001.

Conclusions: The use of an informatised tool to assess organisational behaviour allows one not only to adequately measure policies and practices but also to promptly diffuse the results to key players. In the case of maternity care, this timely diffusion will allow study results to act as a catalyst to bring about organisational changes required for the Monteregie hospitals to progress towards achieving the international standards required for Baby Friendly certification.

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081 **TRENDS IN INFANT MORTALITY RATE DURING THE PAST DECADE IN ARMENIA**

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Introduction: The International Development Targets, and the successor, the Millennium Development Goals (MDGs), as poverty reduction strategy explicitly adopt a range of social goals, including reductions of two thirds in infant and under 5 years mortality by 2015. Infant mortality is considered among basic indicators of population health and social economic development of countries and society. During the past decade economic and social situation in Armenia as well as in several countries of the CIS can be characterised as critical. International experience shows that such a situation negatively affects population health, especially infants as the most vulnerable group of population.

Objective: The main goal of this study is to investigate trends in infant mortality during the past decade and define whether Armenia meets MDGs in this concern.

Methods: Calculation of infant mortality rates (IMR) is based on the primary data on live births and infant deaths presented by the National Statistical Service and the Ministry of Health, Republic of Armenia. Statistical analysis of data included calculation of infant mortality rate, its standard deviation and confidence intervals (CI).

Results: Overall, statistically significant (p<0.01) decline (of more than 17%) in infant mortality rate in Armenia has been registered while comparing IMR in 1992 and 2001. The results of more detailed analysis show that noted (p<0.50% (SD 0.01)) decrease in IMR took place only in 1992–1995 (from 18.3 (0.53%)); after that the rate reveals a definite trend to rise—up to 14.03 (0.67%) in 2001 (SD 15.15).

Conclusions: The results obtained witness that the current state of IMR's reduction in Armenia cannot be considered as consistent with the Millennium Development Goals and respective initiatives must be developed and implemented in the country's health care sector in full accordance with the WHO recommendations in this area.

082 RISK FACTORS FOR CHILDHOOD MORTALITY IN SUB-SAHARAN AFRICA—A COMPARISON OF SURVEY DATA FORM INFORMATION FROM A DEMOGRAPHIC SURVEILLANCE SYSTEM

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Objective: We evaluated the accuracy of data from a Demographic and Health Survey (DHS+) with regard to risk factors for childhood mortality, using information from a Demographic Surveillance System (DSS) as the gold standard.

Methods: We performed an analysis of childhood mortality based on birth histories available from the DHS+ survey in Burkina Faso, West Africa 1998–99,[1] which included 4812 households. These surveys are believed to be representative for the whole country. Of all live births from the period 1994–98 (n = 5953), 3544 were taken into account. Similar information (on 7371 children) is available from the Demographic Surveillance System based in Nouna, western Burkina Faso, with a total population of about 60 000 inhabitants. We used all-cause childhood mortality as outcome variable (877 and 559 deaths from DHS, DSS, respectively) Additionally, we investigated the magnitude of underestimation of childhood mortality when using maternal histories to assess childhood deaths (the method used in DHS+ surveys).

Results: A simultaneous estimation of hazard rate ratios by a Cox regression model yielded roughly similar estimates for the DHS+ and DSS data, in line with previous findings[2] (RRs of 1.05 and 1.07, respectively, for males, 3.0 and 2.4, respectively, for "twin birth", but no agreement for "religion"). Of the 7371 children in the DSS data, 118 (95 alive and 23 deceased) would have been missed in maternal histories because the mother was deceased.

Conclusions: These findings demonstrate that, despite some limitations, DHS+ surveys are broadly comparable to the more precise DSS data, and are therefore a valuable tool for assessing the importance of risk factors for childhood mortality in sub-Saharan Africa. This will help us in the investigation of new methods of estimating childhood mortality for a whole country, based on DSS data and knowledge about the distribution of the main risk factors.

1. **Institut National de la Statistique et de la Démographie and Macro International Inc**. Enquête Démographique et de Santé Burkina Faso 1998–1999. Calverton, Maryland, USA: Macro International Inc, 2000.
2. **Becher H**, Müller O, Jahn A, et al. Risk factors of infant and child mortality in rural Burkina Faso. *Bull WHO*, (in press), 2004.

083 THE DYNAMICS OF ANTIPSYCHOTIC DRUG USAGE AND HOSPITALISATION IN FOLLOW UP OF SCHIZOPHRENIA PATIENTS

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Introduction: The dynamics of drug usage are of paramount interest when the different medications are compared with naturalistic study approach. The aim of this study was to model the dynamics of antipsychotic drug usage outside the hospital, and hospitalisations.

Methods: 3232 individuals were followed up after the first episode of hospitalisation due to schizophrenia. After the first episode, the hospitalisations due to schizophrenia, the usage of antipsychotic drugs, and death were recorded for each individual. All data were gathered by register linkage of the Finnish Hospital Discharge Register and the Drug Imbursement Register of National Health Insurance Institute. Follow up period was divided in 30 intervals and the usage of antipsychotic drugs, hospitalisation, or death was determined on each interval. Using these data we composed a state space of 14 states (12 out-hospital drug usage, hospitalisation, and death). 152 411 transitions between states were observed. The dynamics of this state space were modelled with Markov assumption using graphical model approach. Current and previous state of medication, age, sex, length of the first hospitalisation, and the follow up period were used in modelling. Akaike Information Criterion (AIC) was applied in model selection. The results are presented as conditional probabilities of current state given the previous state.

Results: The fitted models showed high connectivity between all of the variables. The probability of continuing in the same state was highest (over 80%) for clozapine and olanzapine, and lowest (about 60%) for levomepromazine and perphenazine depot injections. The probability of hospitalisation was the highest for no medication and haloperidol (oral) groups, and lowest in perfenazine group.

Conclusions: The probability of continuing medication was highest for clozapine and olanzapine. However, the probability of hospitalisation was the lowest for perphenazine users.

084 CONTRIBUTION OF AIR POLLUTANTS IN HOSPITALISATION DUE TO ANGINA PECTORIS AND COR PULMONALE IN TEHRAN CITY: A TIME SERIES STUDY

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Introduction: Health effects of air pollution have been studied in many different parts of the world. However, few studies have explored the cardiovascular impacts of air pollution. For the first time we studied the association between air pollutants and admission due to two cardiovascular disorders, angina pectoris and cor pulmonale, in Iran.

Methods and Materials: This is a retrospective time series study. The variables of the study include the level of five air pollutants—NO_2, CO, O_3, SO_2, and PM_{10}—as independent variables; daily hospitalisation due to angina pectoris and cor pulmonale in 25 academic hospitals in Tehran as dependent variable; and mean daily temperature and relative humidity, seasonality, time trend and day of week as potential confounders. All variables were measured during a 5 year period from 21 March 1996 to 20 March 2001. The data of the 24 h average levels for SO_2, NO_2, CO, PM_{10} and 8 h maximum levels for ozone were collected from one of the stations of Tehran's Air Quality Control Corporation. Data were analysed using Poisson regression models. Relative risks (RR) of hospital admissions for angina pectoris and cor pulmonale were calculated for an increase of 1 mg/m^3 for CO and 10 μg/m^3 for the other pollutants.

Results: Daily admission due to angina pectoris was significantly related to CO level, after controlling for confounder effects. Each unit increase in CO level causes a 1.009 increase in the number of admissions (95% CI 1.004 to 1.015). This association was verified with a lag of one day. There was no significant association between the other air pollutants and number of daily admissions due to angina pectoris. There was no significant association between any of air pollutants and daily admissions for cor pulmonale.

Conclusion: We found that with increasing level of CO pollutant, the number of admissions due to angina pectoris rises. Ischaemic heart disease is one of the leading causes of death in Iran. Air pollution control will reduce the number of this preventable disease and resulting death.

085 ROUTINE ANTENATAL CARE IN GERMANY: SUSPICIOUS SCREENING RESULTS AND THEIR IMPLICATIONS FROM THE USERS' PERSPECTIVE

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Introduction: Antenatal care is well established in Germany, with an almost complete coverage and 10 antenatal consultations per participating woman. Antenatal screening procedures include laboratory tests, physical examination, measurement of blood pressure and weight, and three routine ultrasound scans around week 10, 20, and 30. While specific single screening procedures have been tested in clinical trials, little is known about the combined effect of the whole set of antenatal screening activities in routine antenatal care. Therefore, we investigated the effect of antenatal screening in terms of suspicious or abnormal findings as reported by the mother and/or recorded in the antenatal card, and assessed the predictive properties for selected outcomes.

Methods: Cohort study comprising 360 women enrolled in antenatal classes with follow up from first attendance of antenatal classes (around week 26) until after delivery. The women were interviewed with structured questionnaires with regard to their previous antenatal consultations and related test results and findings; 273 women had a second interview before delivery and 340 women were interviewed postnatally. The postnatal interview included also questions on the pregnancy outcome. In addition, the antenatal cards of the interviewees were reviewed and analysed.

Results: In the first round of interviews 36% of women reported suspicious or abnormal findings; this figure increased to 43% till the end of pregnancy. In total, 495 such findings were reported (some women reported more than one finding). Almost half of these findings (45%)

were based on ultrasound scans, 15% on physical examination, 11% on CTG, 10% on laboratory results, 8% on body weight and blood pressure, and 11% on other investigations. Among the ultrasound based findings, there were 16 suspected malformations, of which three (19%) were confirmed postnatally. Nine other malformations were not detected antenatally (sensitivity 25%). Predictive properties for other outcomes were also poor.

Conclusions: Routine antenatal care in Germany confronts a large proportion of participating women with suspicious findings and test results, most of which turn out to be unrelated to adverse outcomes but may cause considerable distress. The screening quality needs to be improved and women should receive a pre-test counselling on the scope and limitations of antenatal screening procedures.

086 DIFFERENT KINDS OF MISSING VALUE IMPUTATIONS AND THEIR EFFECTS ON OUTCOME ANALYSES OF A RANDOMISED INTERVENTIONAL STUDY

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Introduction: The aim was to evaluate whether different imputing strategies for missing values affect the results of a study on low back function after acupuncture or control. Relevant differences were expected, since missing values were unbalanced and thought to be due to withdrawals because patients were not randomised to their preferred treatment.

Methods: The analyses were based on data of 2841 patients with chronic low back pain participating in a randomised interventional study of 15 sessions of acupuncture (ACU) v control (CON) without acupuncture. We imputed new values to missing data of the primary outcome (back function according to a German questionnaire (FFbH-R)) and of quality of life measured by the SF-36 filled in by patients at baseline and after 3 months. We compared the following imputing strategies for the main outcome: a) last value carried forward (LVCF); b) three different hot deck methods (missings replaced out of all cases (MRA), missings replaced from the other randomised group (MRO), missings replaced from the same randomised group (MRS). In addition, we performed a complete case analysis.

Results: Missing data were found in 11% of the patients (ACU 9.3% v CON 13.2%). The analysis for complete cases showed significant differences between ACU and CON in back function after 3 months (FFbH-R: ACU 74.0 (SD 20.5), CON 65.4 (21.7), p<0.001). Different imputing strategies showed similar and significant p values. Comparing the complete cases analysis with the most conservative imputing strategy (MRO), no relevant changes in means of the outcome were found (FFbH-R: ACU 73.1 (20.8), CON 66.7 (21.8)). The most common strategy of LVCF showed also similar results (FFbH-R: ACU 73.9 (20.5), CON 65.4 (21.7)). For quality of life (subscales of the SF-36) no relevant differences were found as well using the different imputing strategies.

Conclusion: In a randomised study with differential frequencies of missing values, unexpectedly the choice of the imputation strategy had no impact on the results.

087 VERTICAL TRANSMISSION OF HIV IN RIO DE JANEIRO, BRAZIL

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Introduction: Worldwide, millions of children are estimated to have been infected with HIV through mother to child transmission (MTCT). However, in some settings, antenatal screening for HIV infection, proper management with antiretroviral drugs, obstetrical interventions, and avoidance of breastfeeding have reduced the risk of MTCT to less than 2%.[1] In Brazil, pregnant women have been offered HIV testing since 1996. Those found to be HIV seropositive have been offered perinatal transmission prophylaxis with zidovudine according to the ACTG 076 protocol.[2] Subsequently in 2000, Brazilian guidelines regarding the management of HIV infected women have included recommendations regarding administration of other antiretroviral drugs (ARVs) during pregnancy. Triple ARV therapy (HAART) has become standard of care for patients with CD4 counts <350 cells/mm^{3}.

Objectives: To describe a cohort of HIV infected pregnant women in Rio de Janeiro, Brazil, and evaluate risk factors for vertical transmission.

Subjects and Methods: A cohort of HIV infected pregnant women was followed from January 1996 through December 2001. Data regarding women and their children were collected prospectively as part of routine care using the same clinic form throughout the 6 year period and included: demographic data, HIV related history, clinical, obstetric and laboratory history and assessment; infant birth weight, and gestational age. Viral load and CD4 counts of the mothers were obtained at baseline and near delivery. Antiretrovirals (ARVs) were offered for prophylaxis and/or treatment according to Brazilian guidelines. Mothers were counselled not to breastfeed. Zidovudine was given to infants during the first 6 weeks of life and artificial formula was provided. Children were followed up to definition of HIV status. Bivariate analysis and multivariate logistic regression were performed to analyse risk factors.

Results: 297 out of 346 HIV+ women referred to our hospital were included in the analysis cohort. Overall transmission rate was 3.57% (95%CI 1.82 to 5.91) and remained constant over time. Low birth weight was independently associated with a higher risk of vertical transmission (p=0.01), while a longer duration of receipt of ARVs during pregnancy was independently associated with a lower risk of transmission (p=0.04).

Conclusion: Despite availability of free drugs for HIV management in Brazil, further decreases in vertical transmission should be pursued with efforts towards earlier diagnosis and increase in the length of prophylaxis.

088 THE ACCUMULATING EVIDENCE ON PASSIVE AND ACTIVE EXPOSURE TO TOBACCO SMOKE AND BREAST CANCER RISK

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Objectives: To estimate the risks of breast cancer associated with passive and active smoking, and to explore the heterogeneity in individual study results.

Methods: Examination of the 16 published epidemiologic studies of breast cancer risk related to exposure to secondhand tobacco smoke. Analysis of the risk of breast cancer in relation to passive smoking among never active smokers and examination of the risk of breast cancer associated with active smoking after control for passive smoking in the never smoker referent group.

Main Outcome Measures: Summary relative risk of breast cancer among: 1) life long non-smokers with regular passive exposure to tobacco smoke; and 2) women who had smoked compared with women never regularly exposed to tobacco smoke.

Results: The summary breast cancer risk estimate for exposure to passive smoking among women who had never smoked was 1.41 (95% CI 1.17 to 1.70). The individual study risk estimates were heterogeneous: for the 10 studies that had not collected quantitative information on the three major sources of passive smoke exposure (childhood, adult residential, and occupational) the summary risk estimate was 1.15 (95% CI 0.98 to 1.35); where these three major sources of passive exposure were collected, the summary risk estimate was 1.85 (95% CI 1.56 to 2.20). For passively exposed premenopausal women who never smoked the summary risk estimate was 1.99 (95% CI 1.50 to 2.64). For women who had smoked the summary breast cancer risk was 1.68 (95% CI 1.22 to 2.32) compared with women never regularly exposed to tobacco smoke. Individual risk estimates were again heterogeneous: with incomplete passive smoking assessment, the active smoking summary risk was 1.17 (95% CI 0.85 to1.60); with more complete passive exposure assessment, the active smoking summary risk estimate was 2.14 (95% CI 1.56 to 2.92).

Conclusion: There is a growing body of evidence that implicates passive and active smoking as risk factors for breast cancer. More studies are needed with thorough passive smoking assessment and that explore the biological mechanisms that might explain the unexpected similarity of the passive and active risk.

089 BIRTHING PRACTICES AND EXPERIENCES: EVIDENCE FROM THE ARAB REGION

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The Arab region is characterised by a wide variation in population development indicators, fertility rates, and income levels. The region is undergoing a rapid shift from home to hospital births, with an increased uptake of medical technology used in maternity services.

The findings of a coordinated research programme on childbirth issues in the Arab region, namely in Lebanon, Egypt, Palestine, and Syria, provide evidence on the variation in the process of care in these countries, as well as on the discrepancy between routinely followed practices and best practices identified by the literature. Childbirth is highly medicated with a substantial number of unnecessary and even harmful practices such as routine perineal shaving, labour induction, enemas and episiotomies, infrequent use of rooming in, minimal provision of breastfeeding advice and support, and lack of family planning advice being the rule rather than the exception. Women complain about the quality of care in hospitals, especially lack of privacy, bad treatment, and inability to have a companion during labour. They prefer professional delivery in hospitals. They are usually trustful of the physician's decisions of procedures, although they are discontent with many procedures performed. In general, women are not involved in the decision making process for the provision of care during childbirth and are not much vocal about their complaints.

The constellation of the studies conducted in this programme pinpoint problems in the quality of maternity services provided in the region and the lack of women's involvement in the overall process of care. Currently, a number of intervention studies targeting behavioural change among providers and/or women as well as studies evaluating the effectiveness of practices with unknown outcomes are being conducted in the region.

This programme, working through a consolidated network of researchers in the Arab region, provides elucidation of one of the most important rites of passages in women's lives in a region with high fertility rates. The research is also important, as childbirth in the region is salient concerning the implications of shifts from traditional to western biomedical health care systems for an event still highly embedded in traditional understandings and practices. Moreover, the variation in terms of practices and health care systems in our region offers researchers the opportunity to increase knowledge about a variety of intervention practices, with the potential of extrapolating findings to similar situations beyond the region.

090 THE RELATIONSHIP BETWEEN EDUCATION, DISCRIMINATION, AND HEALTH IN A BRITISH STUDY

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Introduction: There is little doubt that exposure to trauma can have negative health sequels but there has been relatively little research on the impact of discrimination on health and its interaction with socioeconomic status. In this study we examine the relationship between education, discrimination, and health among white (n = 227), African Caribbean (n = 213) and Indian and Pakistani (n = 233) adults aged between 18 and 59 years living in Leeds as measured in a stratified population survey.

Analysis: Measures of discrimination included any physical attack, verbal abuse, and unfair treatment on the basis of sex and race. A combined variable, any discrimination, was also developed. Education (above secondary level and secondary level or below), anxious or depressed (quite a lot and a little/not at all), and health status (fair/poor and good/excellent) were coded dichotomously. Analyses were conducted examining the relationship between education and discrimination, discrimination and health, and discrimination and health controlling for education.

Results: People educated above secondary level were more likely than people educated at secondary or below to report being physically attacked (p = 0.001), verbally abused (p = 0.001), and unfairly treated (p = 0.00) on the basis of sex. There were no differences between people educated above secondary level compared with people educated at secondary level or below in reports of being physically attacked (p = 0.6), or verbally abused (p = 0.2) on the basis of race. The more educated group were more likely to report unfair treatment on the basis of race (p = 0.05). People educated above secondary level were more likely that people educated at secondary or below to report more discrimination of any kind (p = 0.00). Any discrimination (p = 0.06), physical attack (p = 0.07), and verbal abuse (p = 0.04) were associated with being very anxious or depressed. Unfair treatment due to sex (p = 0.8) or race (p = 0.1). These results remained the same when education was taken into account. There was no association between having been exposed to any kind of discrimination and having fair or poor health before education was taken into account. Once education was taken into account, having been exposed to any discrimination

(p = 0.04) and verbal abuse on the basis of race (p = 0.03) were associated with poorer health status.

Conclusion: The relationship between education and discrimination in this study is counterintuitive, with people with higher education reporting greater levels of discrimination. The results also suggest that there is a relationship between exposure to discrimination and mental and physical health. However, the effect on physical health is not apparent unless education is taken into account.

091 RISK FACTORS ASSOCIATED WITH LEPROSY IN NORTH EAST BRAZIL: A CASE-CONTROL STUDY IN FOUR ENDEMIC AREA

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Introduction: Brazil report almost 80% of leprosy cases in America. In Ceará, one of the poorest states in North east Brazil, the distribution of leprosy shows a remarkable heterogeneity and a tendency to increase over the past decade. We proposed that analytic epidemiology might provide a clue as to why control efforts have not met the goals set by WHO. We decide to study the risk factors related to leprosy in four areas highly endemic for *Mycobacterium leprae* in Ceará.

Methods: A case-control study was carried out in those areas. Cases: diagnosis of leprosy by clinical characteristics and at least one positive skin smear; patients were registered in the leprosy register not longer than 2 years ago; no case of leprosy reported in the household or in the near neighbourhood; 20 years. Controls: an individual 20 years with no signs of skin disease, who lived in the same municipality as the leprosy case; no leprosy case in the family or in the near neighbourhood and who procured medical advice in the same health unit unrelated to skin problems in which the leprosy patient was monitored. Controls were matched for age and sex, and for each case four controls were studied. A semi-structured questionnaire was used to collect demographic, socioeconomic, environmental, and behavioural data from March to August 2002. Variables were first analysed in a bivariate manner to identify those variables useful for later logistic regression. In a second step a multivariate hierarchical analysis was performed using a model especially developed for this study.

Results: 200 cases and 800 controls were examined. A low education level, previous food shortage, frequent contacts with natural water bodies as well as a low frequency of changing bed linen or hammock were all significantly associated with leprosy. A BCG vaccination was found to be a highly significant protective factor.

Conclusions: In our study all variables that remained significant after logistic regression are—in one way or another—linked to poverty. However, they may act on different levels on the transmission of *M. leprae* and/or the progress from infection to disease. Interestingly, variables reflecting high risk factors for person-to-person spread such as a crowding or sharing the bed or hammock with other household members did not show a significant association with leprosy. These puzzling observations have generated the hypothesis that beside person-to-person spread *M. leprae* might be transmitted by indirect means and that other reservoirs should exist outside the human body. Water has been considered a putative source of infection with *M. leprae* already in the early days of leprology. In conclusion, the study shows that certain environmental risk factors exist that favour the occurrence of leprosy in an endemic area and which could be targeted in control measures.

092 RANDOMISED PRIMARY CARE BASED EVALUATION OF RAPID RESULTS IN GLYCATED HAEMOGLOBIN TESTING IN TYPE 2 DIABETES: THE RIGHT STUDY

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Introduction: In the UK, general practitioners have an increasing role in the care of people with type 2 diabetes and intensive management has been shown to be effective and safe. The aim of this study was to evaluate the use of a near patient test (NPT) for glycated haemoglobin (HbA1c) in the management of patients with type 2 diabetes, in primary care.

Methods: The study design was a randomised controlled trial, set in eight general practices in Leicestershire, UK. Patients were randomised

individually, to a control group receiving ''usual care'' (venepuncture) for laboratory measurement of HbA1c or an intervention group tested and managed using the Bayer DCA2000 NPT system. The study follow up period was 12 months. Proportions and 95% CIs of patients with good glycaemic control, defined as HbA1c $\leqslant 7\%$ were estimated and compared in intervention and control groups at baseline and end of study, using laboratory results in all cases. Multiple logistic regressions were used to adjust for potential confounding factors and odds ratios (95% CI) were estimated.

Results: 638 patients (319 interventions, 319 controls) were randomised and included in the intention to treat analysis. Intervention and control groups were similar at baseline with respect to sex, age, duration of diabetes, and treatment. The proportions (95% CI) achieving good metabolic control (HbA1c $< = 7.0\%$) were NPT 0.44 (0.39 to 0.49) v controls 0.40 (0.35 to 0.46) at baseline and NPT 0.40 (0.35 to 0.46) v controls 0.37 (0.32 to 0.42) at follow up. These differences were not statistically significant at the 5% level at either time point. The unadjusted OR (95% CI) for NPT patients (compared to controls) achieving ''good'' control at follow up was 0.96 (0.70 to 1.31). The final model resulting from multiple logistic regression modelling included sex, duration of diabetes, treatment at baseline, deprivation score, and baseline HbA1c status. The OR (95% CI) for the NPT v control group was 0.84 (0.58 to 1.22), representing an 16%, statistically non-significant reduction in achievement of good control after the intervention and one year of follow up compared to controls.

Conclusions: Proportions of patients achieving good control were very similar in both groups throughout this study. The use of a NPT to measure HbA1c in patients with type 2 diabetes in primary care is unlikely on its own to lead to improvements in metabolic control. Perhaps 1 year of follow up is insufficient to detect improvements. Rapid feedback of test results to patients is an appealing concept, and further evaluation, perhaps using an algorithm to guide prescribing to achieve specified targets would be useful.

093 ENVIRONMENTAL FACTORS AND HELICOBACTER PYLORI INFECTION IN CHILDREN AND YOUTH IN POLAND: POPULATION BASED STUDY

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Introduction: Helicobacter pylori infection is predominantly acquired during childhood. Despite its high prevalence and serious clinical results, there have been few large population based studies examining epidemiology of its infection. The purpose of the study was to assess the distribution and determinants of H. pylori infection in Polish children and youth.

Methods: The cross sectional study on prevalence of H. pylori infection was administered to 2382 children aged 1 to 18 years in six university centres in Poland. H. pylori status was determined by level of specific IgG antibodies (>24 IU/ml). Data on demographic factors, socioeconomic status, living conditions, and hygienic habits were collected by interview (with children over 14 and with parent of younger ones).

Results: The overall prevalence of H. pylori infection was 32.0% (95% CI 30.4 to 33.6). Prevalence increased with age from 26.4 in 1–3 years old to 36.5 in 15–18 years old. Infection is not associated with sex (34.0% in boys and 31.7% in girls). It was more common in rural areas (38.1%), than in small ($<100\,000$ dwellers) and big cities (respectively 34.2% and 25.5%). Probabilities of having infection were statistically higher in children from families greater than four persons (36.0% v 29.2%), with more than two children (39.5% v 30.5%), rather poor (public assistance help) (45.4% v. 31.0%), living in flats with less then $10 m^2$ per person (40.7% v 30.8%), with wells as the source of water (42.0% v 34.2%), and without sewage system (37.6% v 30.7%). Prevalence of infection was higher if a family of child owned a piece of land (39.4% v 29.7%), farm animals (39.4% v 29.9%), and children helped in farm works (39.3% v 29.9%). Drinking non-boiled water increased infection prevalence (39.4% v 28.5%), like eating not washed fruits (39.8% v 31.6%) and having a bath no more than once a week (40.9% v 29.7% for at least once a day). Following variables remained statistically significant after adjusting for sex, age, and place of living and were taken into the final multivariate logistic model: number of children in a family OR = 1.13 (95% CI 1.03 to 1.25), housing density <10 m^2/person OR = 1.53 (95% CI 1.12 to 2.09), public assistance OR = 1.40 (95% CI 1.02 to 1.92), help in soil cultivation OR = 1.35 (95% CI 1.08 to 1.68), and drinking non-boiled water OR = 1.40 (95% CI 1.13 to 1.74).

Conclusions: The importance of household living conditions and poverty in acquisition of H. pylori infection in childhood was confirmed. Household crowding, living with others children, and necessity of public assistance were identified as risk factors for infection. Additionally work in contact with soil and drinking non-boiled water could increase the probability of infection.

094 HANDLING OF MISSING VALUES IN BIOLOGICAL MONITORING DATA ANALYSIS

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Introduction: Biological monitoring is based on the repeated measures data analysis. But the contingent often varies over the whole period of longitudinal study. Therefore, the problem of data analysis arises in estimating loses of subjects. Missing data may reduce the precision of calculated statistics. Because lead is known as toxic heavy metal, the accuracy of its effect estimation is necessary. The objective of this study was to find an appropriate method for estimation of missing values in the assessment of changes of one of the most sensitive biomarkers of lead toxicity, delta-aminolevulinic acid dehydratase (delta-ALAD) activity, and lead concentration in blood (PbB).

Methods: The biological monitoring of workers, occupationally exposed to lead, has been conducted over 6 years (1998–2003). Blood lead concentration was determined by atomic absorption spectrophotometer with Zeeman Effect. Delta-ALAD activity in blood was measured according to the European standardised spectrophotometric method. Four methods of handling with missing values were considered: listwise deletion, adding/subtracting mean of differences between adjacent measurements, expectation maximisation, and regression. Repeated measures analysis of variance was applied for evaluation of changes in delta-ALAD activity and PbB over all period.

Results: The mean of PbB without filling missing data in every year of study was 6.28, 8.65, 4.73, 4.77, 4.44, and 3.62 μg/dl respectively. The mean of delta-ALAD activity without filling missing data in every year of study was 0.646, 0.440, 0.439, 0.352, 0.568, and 0.474 μmol/s*l, respectively. All methods of missing values estimation produced similar results: the long term exposure to lead was related to negative changes in delta-ALAD activity even after cessation of lead exposure and might cause disorders in haem biosynthesis.

Conclusions: Listwise deletion is easy but inefficient method for handling missing data. Filling missing data with plausible values is more efficient, but it requires care to avoid data distortion. Regardless of the imputation method merits, imputed values are only estimates of the unknown true values.

095 A COMPARATIVE EVALUATION OF TWO DIFFERENT APPROACHES TO DETERMINING ADIPOSITY REBOUND

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Introduction: Prevalence of overweight and adiposity among children and adolescents have increased dramatically. Research focuses on critical periods over the life course, such as the time of adiposity rebound (AR). Recent data showed that age at AR is associated with higher body mass later in life. AR occurs during childhood (between ages 3–8) when the child starts to gain more weight relative to the growth of length. To study its effects or determinants, AR needs to be determined. To date, two approaches have been applied: the visual inspection (VI) of individual body mass index (BMI) curves, and the use of a polynomial equation (PE) of varying degrees. Different approaches might lead to different results and thereby impair conclusions. So far, no formal evaluation was published comparing these approaches. We used one dataset to compare different approaches to determine AR.

Methods: Children were selected from the DONALD (DOrtmund Nutritional and Anthropometric Longitudinally Designed) study, an ongoing study assessing detailed anthropometry between infancy and adulthood. Weight and height are measured annually and BMI was calculated as weight (kg)/height (m)^2. Children with data gaps >1.5 years between age 2 and 10 were excluded, as were children with abnormal growth curves. Age at AR was determined both with VI of individual BMI curves according to preset criteria, and with PE of 2nd, 3rd and 4th order. In 119 children AR was determinable with all methods.

Results: Mean age at AR ranged from 5.27 (years) to 5.67 in boys and from 5.44 to 5.96 in girls, depending on method. In both sexes, the

VI yielded the highest, the 3rd degree PE the lowest estimate. Mean differences in age at AR between VI and the different PE are ranged from 0.30–0.40 in boys, and 0.39–0.52 in girls. We categorised age at AR estimates from both methods (early, medium, late) and cross classified them. Compared with VI, the 2nd order PE had the highest concordance (58% same category, no opposing classification). Within the PE approach, the 3rd and 4th order PE had the highest concordance (77% same category, no opposite classification). Goodness of fit measures of the PE indicated that the 2nd order polynomial had the best fit.

Conclusion: In a dataset with highly complete measurements and no undeterminable AR, the use of PE did not yield substantial advantages over the VI. In a more realistic study setting including unusual growth curves, a visual inspection of all growth curves in which PE cannot determine AR would be necessary. If identical approaches to determination of AR are favoured, VI for all curves is required. We conclude that the VI is a practical method with satisfactory results. However, in the face of missing data, an issue not studied here, PE approaches may have advantages.

096 **COST OF ILLNESS IN RELATION TO DISEASE CHARACTERISTICS IN PATIENTS WITH GASTRO-OESOPHAGEAL REFLUX DISEASE OVER TWO YEARS**

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Objective: Gastro-oesophageal reflux disease (GERD) is a prevalent condition with symptom frequency up to 50% in the general population. The disease is characterised by frequent relapses and requires long term management with considerable medical and socioeconomic implications. We aimed to assess disease related costs in relation to patients and disease characteristics including quality of life (QoL) during two years of routine care (RC).

Methods: ProGERD is a multicentre cohort study of 6215 outpatients with GERD predominantly from Germany (mean age 54 (SD 14), 47% female). Patients were endoscoped and received initial standardised treatment with a proton pump inhibitor for 2 to 8 weeks. During the following observational period, patients received RC at the discretion of their primary care physician. After 1 and 2 years of RC, medication, and other patient and disease variables were assessed by patient questionnaires (response 90% and 86%), including the Reflux Disease Questionnaire for reflux symptoms (RDQ, min: 0, max: 36), and the Quality of Life in Reflux and Dyspepsia for disease specific QoL (QOLRAD, min: 1, max: 7). Disease related direct cost data (medication, physician visits, and hospital admissions) were calculated by multiplying disease related medical resource units with cost factors by unit. Indirect costs were not included in this analysis. Factors associated with those direct costs were analysed by multiple regression analysis.

Results: Disease related direct costs amounted to a mean of €361 (SD 911) per patient per year. Significantly higher amounts were observed in patients with severe GERD (erosive GERD: mean €438 per patient per year, or Barrett oesophagus: mean €566 per patient per year) v non-erosive disease (€282), in patients with long-standing GERD > = 5 years (€438) v duration <5 years (€331), and in patients with concomitant diseases (€394) v no concomitant diseases (€246). Direct disease related costs were increasing with decreasing disease specific QoL (highest quartile of QOLRAD score: €308 v lowest quartile: €496). Medication costs were the main proportion of the total direct costs (71%), followed by hospital care (22%) and physician visits (7%). According to multiple regression analysis, the amount of direct costs was significantly associated with concomitant diseases and with GERD related characteristics including frequency and severity of reflux symptoms (RDQ score), GERD classification, and disease specific QoL (p<0.05). Disease related direct costs did not differ significantly with respect to socioeconomic factors such as age, sex, and education.

Conclusion: In RC, direct costs for GERD varied considerably, mainly depending on disease specific characteristics and not on socioeconomic factors. Medication costs contributed markedly to the disease related costs and were similar to those in patients with statin therapy for hyperlipidaemia[1].

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1. **Schwabe U**, Paffrath D. Berlin: Arzneiverordnungsreport Springer Verlag 2003.

097 **COSMETIC BREAST IMPLANT SURGERY IN FINLAND—EPIDEMIOLOGICAL STUDY OF LOCAL COMPLICATIONS AND POSTOPERATIVE QUALITY OF LIFE**

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Introduction: Use of silicone breast implants in cosmetic breast surgery has increased rapidly and many questions have been raised regarding the safety of silicone implants. Recently, the occurrence of local complications has been set as the primary concern in research related to cosmetic breast implant surgery. The main aim of this study was to find out the frequency rates of local complications in a population of cosmetic breast implant patients in Finland.

Aim: To also collect information on postoperative personal opinions and quality of life.

Methods: Patient records of 685 women were identified to collect information on implant characteristics, complications, and treatment procedures. Information on personal characteristics, medical and reproductive history, and postoperative quality of life were obtained through structured questionnaires mailed to 470 women of the same cohort.

Results: 36% of the women had at least one complication diagnosed in patient records. Capsular contracture was the most common complication, diagnosed in 17% of the women. Other complications were found to be quite rare. 26% of the women had undergone at least one postoperative treatment procedure. Capsular contracture was the main indication for additional surgery. Most of the women (89%) were satisfied with their decision to undergo the implantation operation. However, only 40% of the women were satisfied with the preoperative information on possible health effects related to breast surgery. Only 9% of the women reported increase in their postoperative health status, whereas majority reported positive effects on their self confidence (79%) and appearance (89%).

Conclusions: Epidemiological information on postoperative complications as well as quality of life questions and personal satisfaction related to cosmetic breast implant surgery has been insufficient and sparse. Our data confirm previous results of capsular contracture as a most significant and common complication in cosmetic breast implant surgery and of quite low frequency of other complications and represent interesting perspectives on personal satisfaction and postoperative quality of life related to breast surgery.

098 **EXCESS DEATH ATTRIBUTABLE TO INFLUENZA IN THE CZECH REPUBLIC IN 1982–2000**

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Introduction: Annual influenza epidemics differ in duration and magnitude. Influenza infection is underestimated, being easily mistaken for one of acute respiratory diseases (ARD) since it has similar clinical symptoms. The aims of this paper are to find correlation between mortality and influenza morbidity and to model mortality in different weeks of the year outside the influenza epidemic.

Methods: Data on daily deaths from all causes and deaths from diseases of the circulatory system in the Czech Republic were available for 1982–2000 (altogether 2 323 424 and 1 293 786 deaths reported, respectively). Data on the incidence of influenza and other ARD were taken from the surveillance programme. The weeks in which ARD morbidity exceeded the epidemic threshold and at the same time, circulation of influenza virus among the population was reported by the NRL for influenza were considered as influenza epidemic weeks. Analysis was based on the assumption that outside the epidemic periods, deaths are distributed according to the Poisson distribution with a linear trend depending on time and with periodic behaviour during the year. The morbidity rate is only expected to increase in the epidemic compared with non-epidemic period.

Results: When comparing the weekly morbidity from acute respiratory illnesses and weekly mortality for all causes of death, the peaks of these two parameters almost overlap. In the epidemic period (178 weeks) 49.4% of findings were above the unilateral 95% tolerance limit of the model, compared with the non-epidemic period (813 weeks) with only 6.8% of findings above this limit. The mean estimated excess of annual

deaths from all causes was 2764 (min −630; max 7049). The median of deviations of the estimated number of deaths from the actual number of deaths is negligible, that is, 0.8 (95% CI −5.3 to 7.0), for the non-epidemic period, being equal to 204.7 (95% CI 175.4 to 249.6) for the epidemic period. Similar results were found for deaths from diseases of the circulatory system accounting for 55.7% of all deaths in the study period. The median of deviations of the estimated number of deaths due to diseases of the circulatory system from the actual number of deaths is 1.0 (95% CI −3.2 to 6.5) for the non-epidemic period, being equal to 133.2 (95% CI 116.4 to 166.3) for the epidemic period.

Conclusions: The presented results confirm clearly and unambiguously excess in death rates during the influenza epidemic periods, depending on the duration and magnitude of the epidemic. The mean annual excess rate for the Czech Republic is 2.24% population, the major part of this rate being attributable to influenza. Vaccination against influenza proved both effective and cost-effective and therefore is to be recommended as the most important preventive measure.

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099 MORTALITY AMONG MIGRANTS FROM EASTERN EUROPE IN GERMANY—A RETROSPECTIVE COHORT STUDY

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Introduction: Since the late 1980s, almost 3 million ethnic German "Aussiedler" have migrated from Eastern Europe to Germany. Their health status could be influenced by the "mortality crisis" in Eastern Europe, where cardiovascular diseases and external causes cause an extraordinarily high number of premature deaths, and by their comparatively low socioeconomic status in Germany. We assessed their mortality by age, sex, and cause and compared it to that of the German population.

Methods: We established a cohort of 34 394 selected from 281 356 Aussiedler aged 15 years and above who arrived in North Rhine, Westphalia, Germany's largest federal state, between 1990 and 2001 from the former Soviet Union. We established vital status at 31 December 2002 through local registries for the first episode of residence. For deceased cases, we obtained ICD coded cause of death from the state's statistical office. We calculated person years for 5 year age groups, sex, and calendar period. For comparison, we used German mortality data in three different time periods (1990–93, 1994–97, 1998–2002) to account for secular trends in mortality.

Results: The cohort contributed about 214 000 person years with a mean follow up of 6.25 years. 1498 cohort members (4.36%) had died and cause of death information was available for 98%. The Aussiedler had a lower mortality than the general German population. SMR adjusted for age, sex, and calendar period were significantly low for all causes at 0.8 (95% CI 0.7 to 0.9), cardiovascular at 0.7 (0.6 to 0.8), and external causes 0.8 (0.7 to 1.0). Age specific SMR for all causes and CVD were however slightly raised among the younger (15–34) age groups at 1.2 (0.9 to 1.6) and 1.5 (0.8 to 2.4) but significantly lower among the older (65+) age groups at 0.8 (0.7 to 0.9) and 0.7 (0.6 to 0.8), respectively.

Conclusions: Describing the health status of this large minority group in Germany may justify developing appropriate intervention programmes for them. The slightly higher mortality in the younger age groups may be explained by the postulated causes of the "mortality crisis" in Eastern Europe while selection effects and better health care may explain the lower mortality in the older age groups.

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100 THE IMPACT OF DEPRESSION ON THE LONG TERM MORTALITY RISK OF OBESITY. RESULTS FROM THE MONICA/CORA PROSPECTIVE COHORT STUDY

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Introduction: 0besity is associated with an increased risk of multiple severe disease conditions and substantially reduces life expectancy. Additionally, clinical studies have found a direct relationship between obesity and depression. The association was not entirely confirmed or even rejected in epidemiological studies pointing to obesity as related to low levels of depression which led researchers to surmise that the fat were more "jolly". The aim of the present study was to ascertain whether being jolly or depressed exerted an opposed long term total and cardiovascular mortality risk in obese subjects. We also aimed to assess whether gender effects modify the proposed interaction of depression and obesity.

Methods: Data were derived from three subsequent population based surveys (1984–1995) and from an outcome analysis in 1998 of the prospective population based MONICA-KORA Augsburg Cohort Study. We assessed the crude and adjusted hazard ratios of obesity and depressive mood in 3.472 middle aged men and in 2.932 women for the prediction of total mortality. A total of n = 391 male and n = 163 female fatal events were recorded. Multivariate analysis was adjusted for age, survey, cigarette smoking, hypertension, diabetes mellitus, and hypercholesterolaemia Body mass index (BMI) was calculated as weight in kilograms divided by height in square metres. Trained medical staff following a standardised protocol determined body height and body weight. Obesity was defined as BMI ⩾30 kg/m^2. Subjects with a BMI of <18.5 were excluded from the analysis. Depressive symptomatology was assessed using an eight items subscale from the von Zerssen affective symptom check list ranging from 0 to 3, leading to a Likert-like scoring range of 0–24.

Results: In comparison to a subgroup of non-depressed and non-obese subjects, men with a BMI >30 (n = 786) but without signs of depression yielded a crude Cox proportional hazard ratio (HR) to predict total mortality of 1.08 (95% CI 0.76 to 1.54) and an adjusted HR of 1.05 (95% CI 0.74 to1.49) which was not significant. However, obese male subjects in the highest stratum of depression yielded a crude age adjusted HR to predict total mortality of 2.31 (95% CI 1.55 to 3.44; p ⩽0.0001) and an adjusted HR of 1.94 (95% CI 1.29 to 2.93; p = 0.002). For women, the HR to predict total mortality in the high-risk subgroup was 1.77 (95% CI 0.99 to 3.15; p = 0.054) for the crude model and was 1.49 (95% CI 0.81 to 2.73; p = 0.149) for the adjusted model.

Conclusions: This is the first prospective population based study to show that depression and obesity interact significantly and yield markedly different mortality risks. The effect in men is more pronounced than in women.

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101 DELAYED DEVELOPMENT AT 1 YEAR IN VERY PRETERM INFANTS: THE EPIPAGE COHORT STUDY

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Objective: To assess developmental outcome of very preterm children at 1 year in a large population based cohort by questions to parents in a postal questionnaire and to examine the influence of gestational age, gender, intrauterine growth retardation, and cerebral lesions at neonatal ultrasound on infant development.

Methods: All very preterm births in nine regions of France were included; 2276 parents of infants discharged home agreed to a follow up (96%) and 1855 (81%) answered the postal questionnaire before the child was 20 months old. Non-responders did not differ from responders for neonatal morbidity of the child, but they were more often socially disadvantaged. Questions on development were grouped in four scores adding succeeded items: motor, coordination, language, and socialisation. A ratio was calculated by dividing the score of the child by the mean score of children of the same age in months. A delay was defined as a ratio lower than the 20th percentile.

Results: The incidence of a delay increased with decreasing gestational age for motor score: from 32% of delay at 24–25 weeks to 15% at 32 weeks. The same pattern was seen for coordination and socialisation scores. An intrauterine growth retardation was significantly associated with a delay in motor score (odds ratio (OR) adjusted for gestational age 2.1; confidence interval (CI) 1.1 to 3.0). Boys had more delay in language (1.5; 1.1 to 2.0) and socialisation scores (1.5; 1.2 to 1.9) than girls. Cerebral lesions at neonatal ultrasound were related with a delay in the four areas of development, with an increased frequency of delay with increasing severity of ultrasound lesions: 63% motor delay for major white matter disease, 27% for echo densities, ventricular dilatation, or intraventricular haemorrhage of grade 3, 22% for intraventricular haemorrhage of grade 1 or 2, and 15% for no ultrasound lesions.

Conclusion: A postal questionnaire with simple questions on developmental skills to parents can be a useful method to obtain basic information on child development in a survey. Developmental delay was related to lower gestational ages and severity of cerebral lesions.

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102 OUTCOME OF VERY PRETERM BIRTH IN THE FIRST YEAR. MULTIPLE GESTATION VERSUS SINGLETON: THE EPIPAGE STUDY

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Objective: To determine mortality and development in the first year based on gestation type (multiple or single). A cohort of very preterm births was examined.

Methods: The sample was composed of 3673 live births or stillborn (28% multiple gestation) which occurred before 33 weeks births in nine regions of France in a 1 year period. Of these, 2459 were discharged home. For 1877 infants (79%), parents answered a postal questionnaire sent at 1 year of corrected age. Questions on development skills were grouped into four scores: motor, coordination, language, and socialisation. Non-responders did not differ from responders for neonatal morbidity of the child, but they were more often socially disadvantaged.

Results: A multiple pregnancy was associated with a lower rate of stillbirth (14% versus 24%, p=0.001) than singleton. Among live born infants, a trend to a lower survival was seen in infants of multiple than single gestation (83% versus 86% p=0.05). After taking into account gestational age, antenatal steroids, gender and intrauterine growth retardation, this difference was significant (odds ratio (OR) 0.7; confidence interval (CI) 0.5 to 0.9, p=0.01). Infants born from multiple pregnancy had a higher percentage of motor delay (23% versus 18%, p=0.01), and socialisation score (21% versus 17%, p=0.04) which was still significant after controlling for gestational age, gender, bronchodysplasia, cerebral lesions, intrauterine growth retardation. For language delay (16% versus 13%, p=0.08) and coordination delay (17% versus 14%, p=0.17), the percentages were slightly higher among multiple than singleton births, but the difference was not significant.

Conclusion: Very preterm infants from multiple gestations have a slight increased risk for mortality or delay of development in the first year compared with infants from single pregnancy.

103 BEHAVIOURAL OUTCOME AT 3 YEARS OF AGE IN VERY PRETERM INFANTS: THE EPIPAGE COHORT STUDY

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Objective: To determine behavioural outcome at 3 years age in very premature infants in a regionally defined, prospective cohort study.

Methods: The Epipage study includes all live born infants of <33 weeks' gestational age, born in 1997 in nine regions of France and a control group of term infants; 2276 (96%) parents of premature infants discharged home and 557 parents (84%) of term infants agreed to a follow up. A postal questionnaire was answered at 3 years old for 1880 (83%) very preterm survivors and 453 (81%) term infants. Non-responders did not differ from responders for neonatal morbidity of the child, but they were more often socially disadvantaged. Behaviour was assessed with the Strengths and Difficulties Behaviours Questionnaire. We include in this analysis 1228 singleton premature infants without severe neurodevelopment disabilities and 447 term infants.

Results: On the behaviour questionnaire, the very premature infants showed significantly higher difficulties than term children: 20% versus 9% for total difficulties score, 20% versus 11% for hyperactivity score, 16% versus 10% for conduct problems score, 15% versus 10% for emotional symptoms score, 14% versus 7% for peer problems score, 15% versus 11% for pro social behaviour score. Boys had higher total difficulty and hyperactivity scores. A lower socioeconomic status was related to a higher frequency of behavioural problems, which was significant for total difficulty score, conduct problems score and pro social behaviour score. After controlling for gender, mother's age, and socioeconomic and marital status, most differences between very preterm and term children were still significant: for total difficulties (odds ratio (OR) 2.3; 95% confidence interval (CI) 1.6 to 3.3; p=0.001), hyperactivity (OR 2.0; CI 1.4 to 2.8; p=0.001); conduct problems (OR 1.7; CI 1.2 to 2.4, p=0.006), emotional symptoms (OR 1.6; CI 1.1 to 2.4; p=0.007); and peer problems (OR 1.9; CI 1.3 to 2.9; p=0.002). These differences in behaviour persisted when additional controls were added for health or development of the child.

Conclusion: The prevalence of behavioural problems assessed by parents at 3 years of very premature infants was higher than in term infants.

104 MORTALITY DUE TO NON-OBSTETRIC CAUSES IN WOMEN IN THE EXPANDED PREGNANCY PUERPERAL CYCLE

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Background: During pregnancy or within a period of up to a year afterwards (the so-called expanded pregnancy-puerperal cycle), the woman may die due to known obstetric causes and there is a higher risk of death from non-obstetric causes. The American Centers for Disease Control and the American College of Obstetricians and Gynaecologists use the terminology "pregnancy associated death" to identify such events.

Objective: To compare the distributions of deaths of women of fertile age (10−49 years) according to the underlying causes and their actual conditions (if they were in the expanded pregnancy puerperal cycle or not).

Methods: The investigation of the mortality of women between 10 and 49 years old, following the Reproductive Age Mortality Survey methodology, in the 26 Brazilian capitals of state and the federal district (Brasilia), made it possible to evaluate the actual causes of death. The population of study was taken from death certificates of the residents of these areas, deaths that occurred in the first semester of 2002. For each case, a household interview was performed with the family of the deceased, and one with physicians that handled the case. Medical records and autopsy reports were consulted and data were copied. Using all the additional information, a new death certificate was filled for each case.

Results: There were a total of 7332 female deaths, of which 6869 had not been pregnant or given birth within a year before the death (Group 1). Among the women that were in the expanded pregnancy puerperal cycle, 239 died of obstetric, and 224 of non-obstetric causes (Group 2). It was noted that 23.2% and 63.8% of these deaths, respectively, were of women aged ⩽30 years. The distribution of cases according to the underlying cause (chapters of the IDC-10) showed that external causes were responsible for 33.5% of the deaths in the Group 1, and 15.5% in Group 2. Deaths due to infectious disease and respiratory system problems occurred more frequently in Group 1 than Group 2 (16.5% and 12.17% versus 7.1% and 4%, respectively). In relation to external causes, it was found that homicide was responsible for 19.2% of the deaths of pregnant women, and 5.8% of the non-pregnant. Suicide was present in 7.1% and 2.6%, respectively, making it possible to evaluate the association of depression with these cases.

Conclusions: The important findings of this study open new perspectives for the pursuit of researches and actions in the area of the woman's health, mainly in relation to the cases of non-obstetric deaths, in the expanded pregnancy puerperal cycle.

105 SOCIODEMOGRAPHIC AND PRENATAL AND CHILDBIRTH CARE INEQUALITIES IN THE MUNICIPALITY OF RIO DE JANEIRO: IMPACTS ON BIRTH WEIGHT

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Objective: To analyse sociodemographic and prenatal and childbirth care inequalities and their repercussions on birth weight.

Methods: This study was based on a sample of 10 072 postpartum women treated in public maternity hospitals, hospitals contracted out by the Unified National Health System, and private hospitals in the municipality of Rio de Janeiro in 1999–2001. To verify the association between maternal characteristics and birth weight, multiple linear regressions were performed, stratifying postpartum women by level of schooling. The bootstrap method was used to obtain non-biased estimates of the model's performance, and accurate confidence intervals for the estimates of effects.

Results: For both groups of schooling, birth weight was associated directly with the modified Kotelchuck index and gestational age and inversely with history of prematurity. In the sub-group with less schooling, birth weight was inversely associated with smoking and skin colour (children of white mothers had the highest mean birth weight, while those of black mothers had the lowest). In the sub-group with more schooling, birth weight was inversely associated with the number of hospitals visited before succeeding in being admitted for labour and childbirth. The extreme ranges of maternal age and parity displayed different behaviours from the central range of data, and thus quadratic terms were used.

Conclusions: The variables that explained birth weight in the newborns of mothers with more schooling in RJ were eminently biological, as opposed to the strong presence of social determinants among women with less schooling. In addition, prenatal care exerted a protective role, and smoking had a negative effect, regardless of the mother's level of schooling.

106 PRENATAL CARE AND THE RELATIONSHIP BETWEEN MATERNAL CHARACTERISTICS AND BIRTH WEIGHT IN RIO DE JANEIRO, BRAZIL, MEASURED BY MODIFIED KOTELCHUCK INDEX

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Objective: To examine prenatal care in the city of Rio de Janeiro, Brazil, in a sample of 9920 single birth mothers. A modified Kotelchuck index (KI) was used.

Methods: Multivariate ordinal logistic regression and multivariate linear regression were used to estimate the importance of selected

sociodemographic and obstetric factors for prediction of prenatal services use and its effects on birth weight. A modification of the KI included as the inadequate category both pregnant women initiating prenatal care after the fourth month, having attended more than 50% of the consultations, and women initiating before that period but attending less than half of the consultations.

Results: Only 38.5% of mothers were classified as having adequate and intensive use levels. Educational level (odds ratio (OR) 2.0), living with the newborn's father (OR 2.0), attempted abortion (OR 2.0), diabetes (OR 1.9), satisfaction with pregnancy (OR 1.8), race (OR 1.8), parity (OR 1.7), age of the mother (OR 1.4), and place of residence (OR 1.3) were maintained as predictors of modified KI controlled for other variables. For RLM, age of the mother, living with the newborn's father, smoking, gestational age, parity, previous loss of a child, diabetes, and modified KI were associated with birth weight.

Conclusion: Adequate use of prenatal care in the city of Rio de Janeiro was associated with birth weight, worse social and educational conditions, family support, and the obstetrics risk of the mothers.

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107 WIDENING SOCIOECONOMIC INEQUALITIES IN MORTALITY IN FRANCE?

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Introduction: An increase in social inequalities in mortality rates during the past decades has been reported for several European countries. In France these inequalities are larger than in other European countries; however, the changes over time have been only partly documented.

Objective: To compare the magnitude of socioeconomic inequalities among adults in France between four different periods, from 1968 to 1997.

Methods: The results are issued from a longitudinal national dataset from INSEE (in charge of censuses) linked with causes of deaths from CépiDc, INSERM (in charge of mortality data). Four sub-cohorts comprising about 1% of the French population aged 30–64 years were defined at a census, in 1968, 1975, 1982, and 1990, and the deaths in a 7 year follow up period were recorded. The relative gap in death rates between upper and lower socioeconomic groups in a census was quantified for each of the four periods with a RII (relative index of inequality) using a Cox model.

Results: In analyses restricted to active men, the magnitude of socioeconomic inequalities remained rather stable over the period. However, considering the whole male population, an increase in socioeconomic inequalities from 1968 to 1997 was observed. The contribution of unoccupied and early retired to social inequalities explained this change over time. Around 1970, the percentage of the population in these categories was about 10%, with a high rate of mortality. In 1990 more than 15% of the population belonged to these categories, and the mortality in these subgroups of the population has not decreased in the last 30 years. The magnitude of socioeconomic inequalities was smaller for women than for men. In a context of increasing unemployment, two mechanisms can explain the observed changes: an increase in health selection in various activity sectors, and long term effects of unemployment.

Conclusions: Socioeconomic inequalities remain larger in France than in other European countries, especially for men. In addition to inequalities within the active population, inequalities associated with employment status are increasing. The results highlight the importance of methodological aspects in comparisons between periods.

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108 SOCIAL CLASS AND SMOKING: COMPOSITIONAL AND CONTEXTUAL EFFECTS ON THE PREVALENCE OF CARDIOVASCULAR DISEASE

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Introduction: Cardiovascular disease (CVD) is known to have a pattern according to both individual social class and area deprivation. Moreover, smoking is a known risk factor.

Objective: To explore the geographical patterning of CVD in Scotland and its association with deprivation, and in particular questions whether the association with area deprivation reflects the geographical distribution of individual social circumstances (measured by social class) or of individual risk factors (smoking). A further objective was to examine the effects of social class and smoking when aggregated to the area level.

Methods: The data relate to 8804 adult interviewees aged 18–74 years clustered in 312 small areas, with complete data for smoking and CVD, taken from the 1998 Scottish Health Survey. The response considered was the presence of a cardiovascular condition, which relied on the self reporting of doctor diagnosed conditions (including heart attack, angina, and stroke). Occupation was classified into professional, intermediate, and manual or missing. Smoking was grouped into never smoked, ex-smokers, light, moderate, and heavy. Area deprivation was measured using the Carstairs score (an external measure derived from the 1991 Census). The data were analysed using multilevel logistic regression, and all analyses adjusted for the respondent's age and sex.

Results: The expected gradient was seen for social class, with higher CVD prevalence among manual workers (odds ratio (OR) 1.19, 95% confidence interval (CI) 1.04 to 1.36) relative to professionals. Only ex-smokers showed significantly increased odds of CVD relative to non-smokers (OR 1.18, 95% CI 1.03 to 1.33). The effect of area deprivation was substantial, with a third of the population in the most deprived areas having an OR of 1.32 (95% CI 1.16 to 1.49) compared with the least deprived. The social class gradient disappeared when area deprivation was included, but both area deprivation and individual smoking remained significantly and independently associated with CVD. When individual social class and smoking were aggregated to the area level they showed strong correlations with the area deprivation measure (0.69 and 0.70), and CVD prevalence was strongly associated with both measures.

Conclusions: The lack of a relationship with smoking, apart from among the ex-smokers, is not surprising in a cross sectional study examining prevalence rather than incidence. Despite the lack of an individual relationship, individuals who lived in areas with higher rates of smoking were more likely to have CVD. Given the strong associations with CVD and the Carstairs score, aggregated individual characteristics may provide adequate substitutes for external deprivation measures where these are unavailable. Although there was a strong relationship between CVD prevalence and area deprivation, considerable unexplained geographical variation remained. Neither individual social class nor individual risk factors could explain the relationship between CVD and area deprivation.

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109 WAR RELATED HEALTH AND GENDER DIFFERENCES

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Introduction: The number of people living as refugees has grown over the past several decades. Manmade disasters have a severe impact on health across men and women and across cultures. The impact of violence on human health is an important area of epidemiological research. There is conflicting evidence about gender differences of the prevalence of post-traumatic stress disorder symptoms (PTSD). Female preponderance in prevalence, incidence and morbidity risk for posttraumatic stress disorder is under review.

Objectives: To assess the prevalence of morbidity of Kosovan refugees living in Germany and to analyse gender differences in symptom levels; to unmask differences in morbidity between men and women by assessing carefully symptoms.

Methods: A cross sectional cluster sample survey was conducted among refugees living in Germany. Main outcome measures were PTSD symptoms, depression, and anxiety. Using the Harvard Trauma Questionnaire and the Hopkins Symptom Checklist 25, 99 refugees were interviewed face to face. Main biographical data were collected.

Results: Men and women were exposed to high levels of adversity; most commonly reported events were forced expulsion and deprivation of water, food, and shelter. Values higher than the threshold level were reported by 41.9% of the sample. No differences in symptom levels between men and women were found.

Conclusion: High levels of impairment are likely to occur in populations affected by mass violence. PTSD seems to be as likely in men as in women after exposure to manmade disasters. Modelling PTSD as a unidimensional construct seems to mask symptom differences between men and women. Further research is needed to get to know better the impact of manmade disasters on health of men and women.

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110 DIETARY PATTERNS AND RISK OF MYOCARDIAL INFARCTION IN MEN

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Introduction: Epidemiological studies on diet and coronary heart disease mainly focused on the effect of single nutrients and foods, but the effect of

overall dietary patterns on the disease remains to be elucidated. South European countries, where specific dietary patterns are well recognised, may add useful information for understanding the risk relationship of diet to heart disease.

Objective: To evaluate the associations between overall dietary patterns and acute myocardial infarction (AMI), using a population based case–control study

Methods: Cases were 511 consecutive male patients, older than 39 years, with a first non-fatal myocardial infarction, admitted to the coronary intensive care unit of a major teaching hospital. Community controls were 599 individuals from the same catchment area, with no evidence of infarction, selected by random digit dialling (participation proportion 70%). Trained interviewers using a validated 86 item semi-quantitative food frequency questionnaire obtained dietary intake. Five dietary patterns were identified using independent component analysis on the caloric contribution of 25 chosen food groups: (1) higher consumption of vegetables, fish, beans, and soup; (2) higher consumption of alcoholic beverages, especially beer and spirits, and lower consumption of vegetables and fruits; (3) low caloric intake; (4) higher consumption of wine and red meat; and (5) higher consumption of milk. Odds ratios were calculated using unconditional logistic regression.

Results: Cases were significantly younger and less educated than controls, and significantly more often reported a family history of AMI (29.9% versus 19.4%), hypertension (40.7% versus 30.7%), diabetes (14.1% versus 7.0%), and angina (5.1% versus 2.5%). Cases were also significantly more often current smokers (56.1% versus 30.7%) and less frequently engaged in leisure time physical activities (20.4% versus 41.6%). In crude analysis and considering pattern 1 as reference, we found an increased risk of AMI for every other dietary pattern, the odds ratio (95% confidence interval) being 4.70 (2.21 to 9.98), 2.04 (1.11 to 3.76), 3.65 (1.98 to 6.76), and 1.95 (1.01 to 3.75), respectively. After adjusting for age, education, leisure time physical activity, smoking, and family history of MI, the increased risk remained, with slight modification of the odd ratios: 2.72 (1.19 to 6.23), 2.67 (1.37 to 5.21), 3.21 (1.64 to 6.27), and 2.28 (1.11 to 4.67) respectively for patterns 2−5.

Conclusions: This study identified a dietary pattern clearly associated with a lower risk of AMI, characterised by higher consumption of vegetables, fish, beans, and soup. The other four patterns identified according to dietary choices showed no different effect on AMI risk.

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111 VICTIMISATION AND COMMON MENTAL DISORDERS: A COHORT STUDY AMONG CIVIL SERVANTS IN RIO DE JANEIRO, BRAZIL

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Introduction: Violence exposure has been identified as an important stressful life event associated with mental disorders. In large Brazilian cities such as Rio de Janeiro, violence is reaching epidemic levels, affecting society as a whole; however, this issue is largely unexplored in relation to mental disorders.

Objective: To investigate the role of victimisation (hold up/theft and physical aggression) on the incidence and maintenance of common mental disorders (CMD), after two years.

Methods: A prospective cohort study (Pró-Saúde Study) was conducted, in which socioeconomic and demographic factors, as well as being a victim of physical aggression and/or hold up/theft were measured at baseline (phase 1–1999), and CMD were measured at phases 1 and 2 (2001). Participants were civil servants of a university in Rio de Janeiro, aged 20–75 years at baseline, of whom 55% were women and 45% men. The overall response rate for the study at follow up was 81%, comprising 3252 subjects. A standardised self administered questionnaire assessed the occurrence of victimisation in the previous 12 months, and the socioeconomic and demographic characteristics of the population. Common mental disorders were assessed using the General Health Questionnaire (GHQ-12), a self assessed measure of psychiatric morbidity. Logistic regression was used to adjust for potential confounding variables and to examine the independence of the associations.

Results: The risk of CMD after 2 years of follow up was higher for those who had suffered a physical aggression (odds ratio (OR) 2.2; 95% CI 1.3 to 3.7) or had been a victim of hold-up/theft (OR 1.5; 95% CI 1.1 to 2.1). Having suffered physical aggression was also associated with a higher risk of maintenance of CMD (OR 1.7; 95% CI 0.9 to 3.2). The analysis performed separately for men and women, showed that the association between physical aggression and incidence of CMD was stronger for women (OR 3.1; 95% CI 1.5 to 6.4) than for men (OR 1.4;

95% CI 0.6 to 3.4). For maintenance, the pattern was the same, and physical aggression was only associated with CMD in women (OR 2.3; 95% CI 1.0 to 5.5). Being a victim of hold up/theft was associated with a higher risk of onset of CMD for men (OR 1.6; 95% CI 1.0 to 2.7) when compared with women (OR 1.4; 95% CI 0.9 to 2.1); but no association was found for both men and women for upholding CMD.

Conclusions: Being a victim of physical aggression was strongly associated with both onset and maintenance of episodes of CMD in women only. Being a victim of hold up/theft increased the risk of onset of CMD but not their maintenance; this effect is stronger for men than for women. Differences in the impact of type of victimisation in the risk of CMD for women and men need to be better understood, as this study does not evaluate in which context victimisation occurred.

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112 LONG TERM MORTALITY IN A COHORT OF INTRAVENOUS DRUG USERS: 1986–2001

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Objective: To describe the changes in the mortality rates and the distribution of the causes of death between 1987 and 2001 among a cohort of intravenous drug users (IDUs).

Methods: Cohort study of 6178 IDUs recruited between January 1990 and December 1996 in three AIDS prevention and information centres for voluntary counselling and testing in Valencia (Spain) and followed up until November 2001. Sociodemographics, drug using behaviours and HIV status were obtained at study entry. Causes of death were ascertained from death registries and classified as AIDS related deaths, deaths due to liver disease, drug related deaths, deaths due to cardiovascular disease, violence related deaths, and tumours. Cause specific rates were calculated for periods before and after 1997 (date of introduction of highly active antiretroviral therapy (HAART) in Spain) and were adjusted through Poisson regression assuming independence. Rate ratios (RR) were adjusted by sex, age at first visit, and duration of drug use. The seroconvert group was excluded of the statistics analysis because of its sample size.

Results: Median age at study entry was 26 years (interquartile range (IQR) 23 to 30); median duration of addiction was 6 years. IDUs comprised 77.4% men and 22.6% women; 3320 (53.7%) were HIV negative, 2614 (42.3%) HIV positive, and 244 (3.9%) had seroconverted (IQR 2.3 to 10.0). Median follow up time was 8.7 years (IQR 6.7 to 10.7). There were 52 099.5 total person years of follow up time and 1.091 deaths. Overall death rate was 20.94/1000 person years (19.73 to 22.22), with a lower risk of death after 1997 (RR 0.85; 95% CI 0.75 to 0.95). Mortality rate was 10.45/1000 person years (9.34 to 11.71) in HIV negative cases and 35.45/1000 person years (32.99 to 38.10) in HIV positive. After 1997 the risk of death decreased in HIV positve cases (RR 0.73; 95% CI 0.63 to 0.85); but increased in HIV negative (RR 1.35; 95% CI 1.07 to 1.70). AIDS related deaths declined after 1997 (RR 0.55; 95% CI 0.47 to 0.67); however, deaths due to cardiovascular disease (RR 2.39; 95% CI 1.28 to 4.46) and tumours (RR 2.08; 95% CI 1.14 to 3.77) showed the opposite trend. Death rates due to other causes (drug use, liver disease, and violence related deaths) did not change over the study period.

Discussion: The overall death rate has decreased since the introduction of HAART in1997 in HIV positive patients because of the reduction in AIDS related deaths. Nevertheless, the risks of other causes of death, mainly cardiovascular disease and tumours, have increased. It is essential to continue to monitor all causes of mortality to identify changes.

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113 DIET AND GASTRIC CANCER: A COMMUNITY-BASED CASE–CONTROL STUDY IN PORTUGAL

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Introduction: The decline in gastric cancer incidence in industrialised countries, the variation in incidence rates across geographical areas, and the effect of migration on risk within two generations point towards the aetiological role of environmental factors. In Portugal, the stomach remains a major cancer location and the decline in gastric cancer is slower than expected.

Objective: We performed the first epidemiological investigation on nutrition and gastric cancer in a Portuguese population.

Methods: Gastric cancer cases were identified in two major hospitals from the northern region of Portugal (Hospital de S. João, Porto, and

Instituto Português de Oncologia Francisco Gentil, Porto) between January 2001 and December 2003. Population controls were recruited by random digit dialling using households as the sampling frame, followed by simple random sampling to select one eligible person among permanent residents in each household. Participants were questioned by trained interviewers and completed a structured questionnaire including sociodemographic, dietary and other lifestyle characteristics. A validated food frequency questionnaire was used to evaluate food intake pertaining to the previous year or in the year before onset of symptoms when applicable. Preference for salty foods and access to refrigeration was assessed using specific questions. Participants with cancer history, cognitive impairment (after the Mini Mental State Examination), or who changed their dietary habits were excluded. Data from 287 cases with histological confirmation and 1096 controls were included in the analysis. Odds ratios (OR) and 95% confidence intervals (CI) adjusted for age, sex, education, smoking status, and total caloric intake were computed by unconditional logistic regression, using Stata®.

Results: Using the lowest quartile of dietary intake as the reference category, the OR for the highest quartiles was 0.5 (95% CI 0.33 to 0.80) for raw vegetables, 0.5 (95% CI 0.35 to 0.79) for fruits, and 2.0 (95% CI 1.37 to 2.95) for pulses. Compared with current non-drinkers OR for the consumption of two or more alcoholic drinks per day was 1.7 (95% CI 1.17 to 2.54). Participants in the highest quartile of preference for salty foods had an increased risk of gastric cancer (OR 2.7; 95% CI 1.46 to 4.85), as did those who lived in a house without a refrigerator at the age of 20 years (OR 1.8; 95% CI 1.03 to 3.26).

Conclusion: Gastric cancer risk was lower in consumers of higher amounts of fruits and raw vegetables while preference for salty foods and lack of access to refrigeration was associated with an increased risk. Consumption of pulses and alcoholic beverages was more frequent in cancer patients. These findings favour an important role for social determinants in gastric cancer epidemiology.

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114 | **A COMPARISON OF SIX METHODS OF ESTIMATING CONFIDENCE INTERVALS FOR AN INDIRECTLY STANDARDISED OUTCOME RATIO**

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Introduction: The performance of healthcare providers is often summarised using the ratio of the number of observed events to the expected number. The expected number of events is usually estimated by using the coefficient estimates from a logistic regression model using a large reference dataset. A variety of methods have been suggested for estimating confidence intervals for such ratios and it is unclear which method is the most appropriate, particularly for small datasets where the assumptions made may not hold.

Methods: The performance of six proposed methods for estimating confidence intervals was investigated and compared using simulated data. For two of these methods (normal approximation and bootstrap) only uncertainty from the observed number of deaths was allowed for. The four other methods additionally included uncertainty from the estimated coefficient estimates used to calculate the expected number of events: bootstrap, a Bayesian approach using MCMC, and two proposed extensions to the Normal approximation proposed by Hosmer & Lemeshow (1995) and Zhou & Romano (1997). For each simulation, two datasets were created: a small dataset to represent the healthcare provider of interest and a large dataset to represent the reference data. Morbidity scores were included, with the same empirical distribution for each dataset, and observations were then sampled using a logistic model with a known linear predictor. These observations were used to estimate the outcome ratio and confidence intervals. Simulations were made of 27 different scenarios, with 1000 repetitions in each case, varying: (*a*) the size of the dataset of interest; (*b*) the size of the reference dataset; (*c*) the underlying probability of death within the dataset of interest. For each scenario the type I error rates and coverage were calculated and compared. Each method was also illustrated using mortality data from 16 UK neonatal intensive care units.

Results: The methods based on the Normal approximation tended to have inflated error rates when the true ratio was greater than unity and reduced rates when the true rate was less than unity. Of these methods, that proposed by Hosmer and Lemeshow performed best, although the error tended to be one sided, especially when the observed number of events was small. Both of the bootstrap methods and the Bayesian model produced more consistent type I error rates.

Conclusions– This study provides evidence that the commonly used method based on the normal approximation performs poorly, particularly when the true standardised ratio differs from unity. The methods based on the bootstrap were straightforward to implement and produced more appropriate type I error rates. The Bayesian approach also performed well and has a number of potential advantages, including allowance for a wider range of model uncertainty and the ability to be extended to more complex scenarios.

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115 | **FAECAL OCCULT BLOOD TEST GUARANTEES A HIGHER COMPLIANCE TO COLORECTAL CANCER SCREENING THAN FLEXOSIGMOIDOSCOPY: RESULTS FROM A CLUSTER RANDOMISED TRIAL**

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Objective: To discover the proportions of compliance to colorectal cancer screening (CRCS) with two types of primary screening test: faecal occult blood test (FOBT) and flexosigmoidoscopy (FS); and to evaluate the role of sociodemographic factors in determining participation.

Methods: This randomised two arm trial was conducted in two health districts of Rome. The units of randomisation were 20 the practice with an average target population of 150 beneficiaries, 50–74 years old. All the individuals were classified according to the participation to the proposed screening as follows. Contacted: subjects who actually received the letter, not contacted: subjects who were unknown at the given address; participants: subjects who either booked an FS or picked up an FOBT kit; performers: subjects who actually performed the screening test, non-performers: subjects who booked an FS or picked up an FOBT kit but did not do the test. The analysis was intention to treat. The effect of individual sociodemographic variables (age, sex, socioeconomic level, length of time of being registered with a doctor) and organisational variables (provider of test, posting of follow up, distance between residence and centre of reference) on compliance was analysed.

Results: There were 1447 individuals referred for FOBT and 1461 for FS. The percentage of non-contacted was similar (6.1% versus 6.9%). FOBT obtained a higher level of participation (21.3% versus 8.2%; RR 2.37; 95% CI 1.92 to 2.93). The probability of performing the test, given the participation, was not statistically different (80.8% with FOBT and 90% with FS). The probability of performance decreased as the distance from the centre where the test is provided increased, independently of the type of test offered. Sex, socioeconomic level, and age bracket did not appear to be associated with performance to a statistically significant degree. The socioeconomic status was an effect modifier of the type of test: in lower classes the difference in compliance was smaller.

Conclusions: Our figures confirm the low level of participation and clearly demonstrate the need for active measures to increase compliance. The type of test is a determinant of participation in the screening, which is independent of sociodemographic variables. FOBT can be considered the test 'most likely to succeed', in terms of implementation of the screening. Efforts must be performed to bring the screening test as close as possible to the healthy target population.

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116 | **INCOME INEQUALITIES IN HOSPITALISATION IN ITALY**

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Introduction: While socioeconomic inequalities in mortality and morbidity measures have been documented, few European studies have evaluated the impact of income in generating a socioeconomic gradient in hospitalisation, acting through a differential incidence of diseases and access to health services. Moreover, little is known on how increasing amounts of income, measured at small area level, affect hospitalisation risk.

Objective: To evaluate the association between small area income and general acute hospitalisation and to analyse the shape of this relationship, with data from four Italian cities.

Methods: Census tract (16 371 areas, median 260 residents) median per capita family income (CTMI) was computed through record linkage between 1998 national tax and local population registries for the cities of Rome, Turin, Milan, and Bologna (total 5.6 million residents). CTMI was assigned to 2 885 541 general acute hospital admissions occurring in the period 1997–2000 among residents in the cities, on the basis of patient's residence. Within each stratum, defined by gender and broad age group (0–64, 65+ years), standardised hospitalisation rates (SHR) $\times$ 1000 residents were computed for quintiles and for 50 quantiles of

CTMI distribution. After assigning the CTMI midpoint value to each quantile, a segmented non-linear model was fitted to the 1998 SHR as a function of CTMI quantiles, with three different connected linear parts. Knots and parameters of the three different linear segments were estimated through the Gauss-Newton method.

Results: Hospitalisation rates were showed to strongly decrease with CTMI, with no difference between cities or across the 4 years of the study period (RR 1.575, 95% CI 1.567 to 1.582 and 1.470, 95% CI 1.461 to 1.479 in the lowest versus highest quintile respectively among the 0–64 and 65+ year age groups). Within the younger group, a negligible linear gradient was found between the 1998 SHR and CTMI in the first income range (up to €6700 income per year for males and €7550 for females). Within the second segment (up to €13 840 for both genders), significant decreases in the hospitalisation rates were found with increasing income; the corresponding slope estimates (expressing increasing SHR$\times$1000 for each €100 increase in income) were -0.85 (95% CI -0.97 to -0.74) for males and -0.91 (95% CI -1.01 to -0.81) for females. In the highest income range, no significant relationship was found. A similar pattern was obtained among older men and women, with a steeper gradient within the intermediate income range, compared with the younger age group, and no gradient among extreme ranges.

Conclusions: Small area income seemed to have a strong impact on hospitalisation risk; however, among the poorest and richest, preliminary results showed that increasing amounts of income corresponded to very slight improvement in health, with small differences by gender and age. If confirmed in future analyses, the negligible health impact of highest incomes could be an additional issue supporting redistribution policies.

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117 EPIDEMIOLOGY OF TRAFFIC ACCIDENT MORTALITY IN THE STATE OF SÃO PAULO, BRAZIL

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Introduction: Traffic accidents (TA) are mainly caused by inadequate driving behaviour, especially drunken driving, and frequently involve young people. As accident causes are preventable and as the population at risk is mostly young, it is an important task to monitor the mortality from this cause.

Objective: To analyse if there had been any changes in the mortality from TA in relation to the Traffic Legislation changes in 1998.

Methods: Age standardised mortality rates from municipal districts with 40 000 or more inhabitants in the state of São Paulo were calculated for each district and divided by sex. Deaths coded V01–V89 using ICD-10 were downloaded from the Mortality Information System. The rate difference between 1999–2000 and 1996–1997 was calculated. The correlation of 1999–2000 rates with some socio-demographic variables was assessed.

Results: Although in both periods male rates were higher in all districts (mean M:F rate ratio 4.9 in 2000) the mean reduction in both sexes was 29%. In almost every district with 400 000 inhabitants or more the male rate reduction was bigger than the mean reduction of the districts as a whole. Four districts presented an increment of male rates between 8.7% and 60%. Masculine rates correlated inversely with the number of inhabitants by car and female rates presented positive correlation with illiteracy. Male rates are quite higher than European rates and also are higher than US and Latin American countries.

Conclusions: The difference in gender of the correlation pattern may point to differences in the type of accidents that kill men and women. In some districts, the rates did not decrease as much as the state means and in some they even increased. The reduction in TA mortality in the majority of districts is probably consequent to several measures implemented after the legislation changed.

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118 FUNCTIONAL GAIN IN POST ACUTE CARE: PATIENT CHARACTERISTICS AND TREATMENT EFFECT

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Introduction: Few studies have examined the effectiveness of rehabilitation and most considered only particular rehabilitation treatments for specific conditions.

Objective: To investigate the association between rehabilitation treatments and functional gain by diagnostic class and severity of impairment.

Methods: Information on the characteristics of patients and the rehabilitative treatments was collected using an Italian version of the Minimum Datase Post Acute Care. The questionnaire was prepared by the Centers for Medicare and Medicaid Services. For each patient the questionnaire addressed clinical and functional status, diagnosis, rehabilitation, and other treatments received. It was completed at regular intervals throughout the hospital stay. The study included 1918 patients admitted from July 2001 to July 2002 in five rehabilitation facilities. We used factorial analysis to summarise each questionnaire section in a single variable. The functional gain was calculated as the difference between functional status at the beginning and at the end of the hospitalisation. A multiple linear regression analysis was performed to evaluate the association between rehabilitation treatments and functional gain, after adjusting for patient characteristics and severity at admission. As the result of the regression model, we estimated: (1) the effectiveness of the stay—that is, the functional gain predicted by the regression equation; (2) the effectiveness of the stay in the absence of rehabilitation treatments—that is, the functional gain predicted by the regression equation when the treatment variables are set to null; and (3) the effectiveness of the rehabilitation treatments, defined as the difference between 1 and 2. The homogeneity of treatment effectiveness across diagnostic classes and quintiles of severity was analysed.

Results: The highest effect of treatment was observed in multiple trauma, where the median of treatment effectiveness was 0.82 (95% CI 0.65 to 1.23) or 57% of total effectiveness. No effect of treatment is observed in Cardiac disease (median -0.01). Treatments were effective in 81% of the cases, while in 76% the positive effect of treatments combined with the positive effect of the stay in the absence of rehabilitation treatments. The positive effect of treatments opposed spontaneous deterioration of patient functional status in 11% of the cases. Overall, hospital stay was effective in 90% of the cases. The functional gain associated with treatments differed across diagnostic classes and was directly associated with severity of functional status at admission.

Conclusions: It is possible to evaluate the effectiveness of treatment in a population of unselected rehabilitative cases. The functional gain associated with the treatments can be combined in different ways with the effectiveness of the stay in the absence of rehabilitation treatments to determine the overall effectiveness of the hospital stay in post acute rehabilitative care.

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119 TRENDS IN THE PREVALENCE OF OVERWEIGHT AND OBESITY IN PORTUGAL, 1995–1999

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Objective: To assess the trends in the prevalence of overweight and obesity in the Portuguese population for period 1995–1999.

Methods: Data from the National Health Surveys, conducted in 1995–6 and 1998–9, amounting to 36 682 men and 61 702 women aged $\geqslant$18 years, were collected. Weight and height were self reported. Obesity was defined as a body mass index (BMI) $\geqslant$ 30 kg/m^2; overweight was defined as 25$\leqslant$BMI$<$30 kg/m^2.

Results: In men, obesity increased from 10.1 to 11.3% and overweight from 39.4 to 41.9% (Mantel-Haenszel test adjusting for age group: p$<$0.001) whereas mean (SD) BMI increased from 25.3 (0.1) to 25.6 (0.1) kg/m^2 (general linear model: p$<$0.001). In women, overweight remained relatively stable from 31.8 to 31.9% whereas obesity increased from 12.5 to 14.0% (Mantel-Haenszel test adjusting for age group: p$<$0.001), and mean (SD) BMI increased from 24.8 (0.1) to 25.1 (0.1) kg/m^2 (general linear model: p$<$0.001). In men, the increase in the prevalence of overweight was stronger in the Centro region (40 to 46%), while a slight decrease was found in the Algarve (40 to 37%), whereas prevalence of obesity increased in all regions. In addition, the increase in overweight and obesity was comparable across age group, educational level, or employment status. In women, prevalence of overweight decreased in age group 25–45 years but increased afterwards, whereas prevalence of obesity increased or remained stable in all age groups. Finally, no differences in the increase of overweight or obesity were found between regions, educational level, or employment status.

Conclusions: Prevalence of overweight and obesity increased in Portugal during the period 1995–9, and this increase concerned virtually

all the subgroups analysed. The health and economic burden of this pathology is currently being analysed.

120 TRENDS IN THE PREVALENCE OF DIAGNOSED HYPERTENSION IN PORTUGAL

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Objective: To assess the trends in the prevalence of diagnosed hypertension in the Portuguese population for period 1987–1999.
Methods: Data from the three National Health Surveys, conducted in 1987–8, 1995–6, and 1998–9, amounting to 55 323 men and 61 702 women aged ≥15 years, were collected.
Results: In men, prevalence of diagnosed hypertension decreased slightly from 16.9% in 1987 to 15.5% in 1999, respectively (Mantel-Haenszel adjustment for age group: p<0.0001). Mean age at diagnosis was 40 years and remained constant throughout the study period. The strongest decrease was found in the Algarve region (20 to 14%), whereas a slight increase was found in the Northern region (16 to 17%). Differential evolutions were found according to educational levels: decrease among subjects with less than 6 years of education, increase in subjects with 7–12 years, and stability among subjects with more than 12 years of education. The decrease was also more pronounced among employed (14 to 11%) than non-employed subjects (23 to 22%). In women, prevalence of diagnosed hypertension also decreased slightly from 25.8% in 1987 to 23.9% in 1999 (p<0.001) and concerned all age groups. Mean age at diagnosis was 39 years and remained constant throughout the study period. As for men, a slight increase in hypertension prevalence was found in the Northern region (24 to 25%), whereas the strongest decrease was found in the Algarve (30 to 23%). In addition, the same differential trends of hypertension prevalence according to educational level or employment status were found.
Conclusions: Compared with other countries, the prevalence of diagnosed hypertension is relatively low in Portugal, and a slight decrease has been noted. Whether this trend reflects a true decrease in hypertension prevalence or is due to decreased screening remains to be assessed.

121 COMPARATIVE PROPORTION OF EMERGENT CARDIOVASCULAR RISK FACTORS IN MALE PATIENTS WITH MYOCARDIAL INFARCTION AND IN THE GENERAL POPULATION WITH NO CLASSICAL RISK FACTORS: THE FORTIAM STUDY

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Introduction: Some patients with myocardial infarction (MI) have no classical cardiovascular risk factor (CRF), such as smoking, hypercholesterolaemia, hypertension, ir diabetes. Emerging risk factors (ERF) such as fibrinogen, lipoprotein (Lp) (a), C reactive protein (CRP), antibodies against Chlamydia pneumoniae and homocystein (Hcy) may play a role in patients without CRF.
Objective: To analyse whether ERF may explain the occurrence of MI in these patients.
Methods: The study comprised 25–74 year old MI patients free from CRF admitted within 24 hours after symptom onset in 23 Spanish hospitals and a control group of healthy subjects free from CRF taken from a random representative population sample. Laboratory measurements were centralised and samples taken within 24 hours after symptom onset. CRF were meticulously studied.
Results: There were 104 male MI patients and 155 men in the random population sample who were free from CRF. Characteristics of healthy controls and MI patients were: age 44.2 (14.0) and 61.8 (9.6) years (p<0.001), body mass index 25.45 and 26.67 (p=0.004), HDL cholesterol 53 (13) and 44 (11) (p<0.001), LDL cholesterol 125 (22) and 120 (31) (p=0.226), Lp (a)* 19 (8 to 66) and 19 (11 to 39) (p=0.886), fibrinogen* 280 (239 to 349) and 337 (225 to 396) (p=0.372), Hcy* 13 (10 to 16) and 11 (8 to 14) p=0.099, C Reactive

protein* 0.60 (0.60 to 0.60) and 0.99 (0.60 to 1.95) (p<0.001), and prevalence of antibodies against C. pneumoniae 70.1% and 87.3% (p=0.007), respectively (*median (25th to 75th centiles, all other values mean (SD)).
Conclusion: Patients with MI and no CRF have higher levels of ERF compared with general population without CRF. This finding suggests that ERF may have a role in the pathophysiology of atherosclerosis and MI in men.

122 GENDER DIFFERENCES IN PREVALENCE AND RISK FACTORS OF SCHOOL BASED HOSTILITY IN ALICANTE, SPAIN

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Introduction: Violence is an emerging problem, which is being addressed by the World Health Organization from a public health perspective.
Objective: To measure prevalence and risk factors of school based hostility in a city in Spain from a gender perspective in order to design appropriate preventive strategies.
Methods: This was a multicentre study involving 14 high schools, public and private, selected by maximum diversity, geographical criteria, and willingness to participate. An ad hoc designed questionnaire was administered to all students from 11–18 years from December 2001 to May 2002. Sociodemographic characteristics, and individual and family behaviour was requested. Hostility was measured through an adaptation of previously validated scales and modelled in both continuous and categorical scales. Internal consistency analyses were carried out with Cronbach's alpha coefficient. A multivariate model was fitted through logistic regression adjusting for school clustering with robust 95% confidence intervals (95% CI) controlling for confounders and checking for interaction.
Results: There were 1924 children, 49.9% boys and 50.1% girls. Median hostility score was higher in boys (9; range 0–52) compared with girls (5; range 0–37), (odds ratio (OR) 0.28; 95% CI 0.21 to 0.37). Age was not associated with hostility in boys (p=0.665) but was in girls (p=0.018). There was a bimodal age pattern in girls' hostility in unvaried analyses, being highest in those aged 13–14 (OR 4.9; 95% CI 0.69 to 36.81) and 15–17 years (OR 2.87 95% CI 0.38 to 21.48) compared with those aged 11–12 years (baseline). Because variables associated with hostility differed by sex, different multivariate models were performed. In boys, having a father without education was associated with a threefold increase in hostility compared with those with a university degree (OR 3.47 95% CI 1.12 to 10.75), as was owning a videogame (OR 2.25 95% CI 1.33 to 3.28). In addition, boys who were consulted about important decisions that affected them were less hostile than otherwise (OR 0.45 95% CI 0.37 to 0.56). For girls, only age and being consulted about important decisions that affected them had statistically significant associations with hostility (OR 0.56 95% CI 0.35 to 0.89).
Conclusions: Hostility is markedly lower in girls compared with boys, and variables associated with school based hostility are also different by gender. Owning a videogame is associated with hostility only in boys, as was having a father with no education. For both boys and girls being consulted at the time of taking a decision was associated with a lower level of hostility. This implies that preventive strategies should be gender differentiated.

123 HEADTEACHERS' PERCEPTION OF SCHOOL BASED HOSTILITY AND BEHAVIOURAL DISORDERS IN ALICANTE, SPAIN: A QUALITATIVE APPROACH

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Introduction: Violence is a complex issue with multiple dimensions, the understanding of which requires multidisciplinary methodologies. The study of violence has been lately analysed within the social epidemiology framework as its components are more influenced by groups than by individuals.
Objective: To explore headteachers' perception of school based hostility in a city in Spain in order to design appropriate preventive strategies.
Methods: This was a multicentre study involving 14 high schools, public and private, selected by maximum diversity, geographical criteria, and willingness to participate. An ad hoc designed questionnaire was administered to all students from 11–18 years from

December 2001 to May 2002. Both headteachers and their students aged 11–18 years were included in the study. The qualitative part of the study involved 14 in depth semi-structured interviews with the high schools' headteachers. The topics addressed were: (*a*) perception of the magnitude of the school based hostility in their centre; (*b*) opinion on the causes of school based hostility; (*c*) evaluation of the positive and negative aspects of their violence prevention school policies; and (*d*) recommendations to develop violence prevention policies. Discourse analyses were performed by textual data from interview transcriptions.

Results: All headteachers agreed that the level of violence is low, occasional, and among well characterised individuals. The type of violence is mainly ''verbal'' with insults and threats (bullying) and very occasionally fights among well characterised individuals. It is noteworthy that headteachers label school absenteeism, lack of interest, and unpunctuality (thus characterised as behavioural disorders) as hostile to other students and teachers. Regarding causes, the commonest cause mentioned is age and is felt as temporary as the violence disappears as they grow older. Poor language skills are also highlighted: ''to compensate for their poor language and communication skills, they fall more easily into violent behaviours''. Boys are labelled as more violent than girls; however, hostility is intra-gender, with boys bullying boys and girls being hostile to girls. Hostility is also related to social violence disclosed in TV and video games and to poor parenting. They all acknowledge carrying out violence prevention policies and are content with them. Their recommendations for future actions include the demand for resources and materials to develop them.

Conclusions: Headteachers perceive that school based violence in this setting is low and thus prefer the better term of hostility. They also identify behavioural disorders as a form of hostility. Most of the identified causes for hostility are external to the schools and highlight different age and gender patterns; poor language skills are recognised as an important cause.

| 124 | MEDITERRANEAN DIET AND RISK OF HYPERTENSION: THE SUN STUDY |

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Introduction: Many components of Mediterranean diet have been independently associated with a lower risk of hypertension. However, whether an overall Mediterranean dietary pattern, with a high amount of energy from fat, is associated with a lower risk of hypertension has not been assessed.

Objective: To evaluate the relationship between an a priori defined Mediterranean dietary pattern and the risk of hypertension in a Spanish cohort study.

Methods: The SUN (Seguimiento Universidad de Navarra) Study is an open enrolment cohort currently including 13 500 university graduates, recruited and followed up through biennial postal questionnaires. Diet was evaluated at baseline with a semi-quantitative food frequency questionnaire, previously validated in Spain. In the first follow up questionnaire, information about a new physician made diagnosis of hypertension was requested. To build a diet score, eight energy adjusted items were categorised in quintiles and the value of the quintile (+1 for the first quintile to +5 for the fifth) was directly imputed for olive oil, fruits, vegetables, fibre, alcohol, fish/shellfish, legumes, and low fat dairy products. Another two items (meat/meat products and glycaemic load) were categorised in energy-adjusted quintiles and inversely weighted (+1 for the fifth quintile to +5 for the first). The 10 items were summed, yielding a composite score ranging from 10 to 50 points. Associations between adhesion to this score and the risk of hypertension were assessed using a Cox proportional hazards model, considering the score as a continuous variable or as a categorical variable (<25, 25–29, 30–34, >34), and adjusting for known risk factors for hypertension.

Results: The follow up rate for a median of 28.5 months was 88.4% after five mailings. We identified 144 new cases of hypertension among 4825 participants included in this analysis, accounting for a total study base of 11 003 person years. Compared with those with <25 points in the Mediterranean score, the hazard ratio (HR) (95% confidence interval (CI)) of incident hypertension for those scoring 25–29 points was 0.73 (0.44–1.22), for those scoring 30–34 was 0.62 (0.37 to 1.03), and for those scoring >34 points was 0.74 (0.44 to 1.25). When considering the Mediterranean score as a quantitative variable, the HR for each

additional point was 0.98 (0.95 to 1.01; p = 0.18); the inclusion of a quadratic term significantly improved the model. The HR (95% CI) for the linear term was 0.76 (0.63 to 0.91; p = 0.003) and 1.004 (1.001 to 1.007; p = 0.005) for the quadratic term, representing a flattening of the dose−response curve for the highest scores.

Conclusions: An a priori Mediterranean dietary pattern was associated with a lower risk of hypertension in a Mediterranean population after adjustment for main risk factors for hypertension with an apparent threshold effect.

| 125 | ANALYSIS OF A COHORT OF CONTACTS OF LEPROSY PATIENTS IN RIO DE JANEIRO |

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Introduction: At the turn of the century, leprosy is still a public health problem worldwide, particularly in tropical zones. The leprosy elimination programme sponsored by the World Health Organisation (WHO), which is aimed at the detection and treatment of newly detected cases, has attained a relative success in the reduction of global prevalence of the disease. The WHO's objective is to reduce the prevalence rate below 1 case/10 000 inhabitants in a worldwide scale until year 2000. Nevertheless, detection rate of new cases continues to grow in some areas, including Brazil, where the prevalence rate is still high (4.33/10 000), as is the detection rate (25.86/100 000). Contact surveillance is a valuable strategy for leprosy control. At the Ambulatory Souza Araújo da Fiocruz, Rio de Janeiro, a dynamic cohort study for leprosy contactants was initiated in 1987, partially financed by WHO. Up to now about 3000 contacts have been registered in the study.

Objectives: To: (*a*) estimate incidence rates in the cohort; (*b*) identify major risk factors for infection stage of the disease; and (*c*) characterise risk factors for disease among followed contacts.

Methods: Statistical models used in epidemiology were utilised to achieve these objectives: these were (*a*) logistic regression models; and (*b*) non-parametric, semi-parametric, and parametric survival models for studying incidence.

Results: The incidence rate of leprosy among contacts was estimated as 0.01694 persons/year in the first 5 years of follow up. The starting time for follow up was the moment of diagnosis of the primary case. The factors associated with becoming diseased were: (*a*) non-vaccination with BCG; (*b*) a negative Mitsuda reaction; and (*c*) a multibacillary clinical form of leprosy. In particular, contacts whose index cases had a high bacilloscopic index at the end of treatment (>1) were at risk. Factors associated with infection, evaluated as seropositive reactions for anti-PGL1 IgM, were: (*a*) young age (<20 years); (*b*) low Mitsuda reaction score (below 5 mm); and (*c*) high bacilloscopic index of the primary case.

Conclusions: The main conclusions of this study point to additional strategies for leprosy control in areas with a high incidence of the disease, including vaccination with BCG, detection of anti-PGL1 IgM, and follow up of newly treated patients, especially characterisation of their bacilloscopic index.

| 126 | APHEIS: AIR POLLUTION AND HEALTH EUROPEAN INFORMATION SYSTEM |

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Introduction: The Apheis programme aims to provide European decision makers, environmental health professionals and the general public with comprehensive, up to date and easy to use information on air pollution and public health, so they can make informed decisions about the political, professional, and personal issues they face in this area. For this purpose, Apheis delivers standardised, periodic reports based on health impact assessments in 26 cities in 12 European countries.

Methods: Apheis centres have been created in all cities participating in the programme. Apheis adopted WHO guidelines for environmental health risk assessment, and we developed our own guidelines for gathering and analysing data, and communicating findings on air pollution and its impact on public health. We estimated the acute impact of PM_{10} and black smoke (BS) on premature mortality using the most recent European exposure−response functions (ERFs). For the chronic

impact of PM_{10} and $PM_{2.5}$ on premature mortality we used Kunzli's 2001[1] and Pope's 2002[2] ERFs respectively. Different scenarios on the health benefits of reducing particulate pollution levels are proposed.

Results: The total population covered in this health impact assessment includes nearly 39 million inhabitants of Western and Eastern Europe. BS measurements were provided by 15 cities, Athens showing the highest mean BS levels (77 $\mu g/m^3$). PM_{10} measurements were provided by 23 cities; in most of them, mean values were below 50 $\mu g/m^3$. $PM_{2.5}$ measurements were provided by 12 cities, with mean values below 20 $\mu g/m^3$. Lower levels would improve public health; for example, in the city of Budapest, all other things being equal, reducing annual mean $PM_{2.5}$ levels (21 $\mu g/m^3$) to 15 $\mu g/m^3$ would prevent around 1700 cases of all cause mortality, 1300 cardiopulmonary, and 222 lung cancer mortality cases in a population of 1.8 million inhabitants.

Conclusions: Apheis has created an active public health and environmental information network on air pollution related diseases in Europe using a standardised methodology. Our findings show that even very small and achievable reductions in particulate pollution levels have a beneficial impact on public health, and thus justify taking preventive action in all cities, no matter how low their levels of air pollution. Our final goal is to deliver the information we provide taking into account the specific information needs of our target audiences.

1. **Künzli N**, Kaiser R, Medina S, et al. Public-health impact of outdoor and traffic-related air pollution: a European assessment. *Lancet* 2000;**356**:795–801.
2. **Pope A**, Burnett R Thun M, et al. Lung cancer, cardiopulmonary mortality, and long-term exposure to fine particulate air pollution. *JAMA* 2002;**287**:1132–41.

127 CLINICAL DIFFERENCES AMONG DENGUE VIRAL SEROTYPES IN RIO DE JANEIRO'S 2001/2002 EPIDEMIC

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Objective: To evaluate clinical and epidemiological differences among the serotypes of dengue in Rio de Janeiro's 2001–2002 outbreak of the disease.

Methods: Of 362 cases that had viral isolation samples, notified by the Information System for Notification Diseases from January 2001 to June 2002, 62 were caused by serotype 1, 62 by serotype 2, and 238 by serotype 3.

Results: Compared with serotype 2, an individual infected by serotype 3 had a 6.07 times higher chance (odds ratio (OR) 6.07; CI 1.10 to 43.97) of presenting with shock and a 3.55 times higher chance (OR 3.55; CI 1.28 to 9.97) of having exanthema. Compared with serotype 1, serotype 3 had a 3.06 times higher chance (OR 3.06; CI 0.99 to 9.66) of causing abdominal pain and a 3.61 times higher chance of exanthema (OR 3.61; CI 1.16 to 11.51).

Conclusions: It was found that individuals infected by the serotype 3 of the virus had signs indicating a more severe disease.

128 ANALYSIS OF SPATIAL DISTRIBUTION OF ASCARIASIS

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Introduction: Ascariasis is an important problem of public health, especially in developing countries. The environment plays an important role in the transmission of this infection. The high prevalence of *Ascaris lumbricoides* is associated with precarious sanitary conditions, constituting an important health indicator.

Objective: To estimate risk areas for *A. lumbricoides* parasitic overload, using geoprocessing and geostatistic methods of analysis.

Methods: A coproparasitological and domiciliary survey was conducted in 19 selected census districts of the state of Rio de Janeiro, Brazil. A sample of 1664 children aged 1–9 years was selected and plotted in their own home centre. Geostatistic techniques allowed spatial exploratory analysis, variographic study, and ordinary kriging.

Student's *t* test, odds ratio, and confidence intervals were used in the statistical analysis.

Results: A prevalence of 27.5% was found for *A. lumbricoides*. Household income, the mother's education level, and the domiciliary conditions were identified as significantly associated factors for occurrence of ascariasis. An isotropic spherical semivariogram model with 150 m reach, contribution of 0.45, and nugget effect of 0.55 was employed in ordinary kriging.

Conclusions: Peridomiciliary impact on ascariasis is confirmed by a spatial continuity of 150 m. Disease occurrence could be estimated in the study area and a risk map elaborated using ordinary kriging.

129 NEONATAL RISK FACTORS FOR RESPIRATORY MORBIDITY IN FIRST YEAR IN VERY LOW BIRTH WEIGHT INFANTS

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Introduction: The enhancement of neonatal physiology knowledge and medical technology advances has improved the prognosis for critically ill babies. Nevertheless, this improvement may be accompanied by higher morbidity due to prematurity and/or intensive care sequelae. The morbidity among many survivors is still a public health problem, leading to numerous cases of hospitalisation for respiratory diseases in the first year of life.

Objective: To evaluate the association between neonatal risk factors and respiratory morbidity during the first year of corrected age of preterms.

Methods: The present study included in the cohort newborn infants of adequate development for their gestational age with birth weights of less than 1500 g and gestational ages of less than 34 weeks admitted to the nursery of a Brazilian hospital from 1998 to 2000. Of 179 babies admitted, 11.2% died during hospitalisation period and in four cases parents refused participation. A total of 58 babies were excluded: 23% were small for gestational age, 4% had genetic syndromes, 4% had congenital malformations, and 1.3% had congenital infections. Before discharge, lung functional tests and high resolution chest tomography (HRCT) were performed. During the first year of life the children received monthly medical follow up and were evaluated for the presence of respiratory morbidity/obstructive airway syndromes, pneumonia, or hospital admission due to respiratory conditions. The association of neonatal risk factors and outcome variables (respiratory morbidity) was independently assessed by relative risk (RR), which was also adjusted through logistic regression.

Results: The cohort constituted 97 premature infants with mean (SD) gestational age of 28.5 (2.3) weeks and birth weight of 1113 (233) g; 28% of these children presented birth weight lower than 1000 g and 42% gestational age lower than 28 weeks. The mean time of oxygen admission was of 24 days and the median was 6 days. Mean (SD) use of mechanical ventilation was 12 (16) days and length of hospital admission was of 58.3 (26) days. The results for lung compliance and lung resistance were altered in 40% and 58.8% of the babies, respectively. Tomography alterations appeared in 62 children (72%). There was no loss during 1 year follow up, and respiratory morbidity was found in 52 children (53%). The incidence rates of obstructive airway syndrome, pneumonia, and hospital admission were 28%, 36%, and 25% respectively.

Conclusions: In this cohort, a high percentage of alterations in lung mechanics and in HRCT was found among asymptomatic premature infants. More than 50% of the children presented respiratory morbidity in the first year of life. The statistically significant risk factors for the outcomes were: simultaneous alterations of lung compliance and thorax tomography (RR 2.7; CI 1.7 to 10), neonatal pneumonia (RR 5.2; CI 1.3 to 20) and the use of mechanical ventilation (RR 3.3; CI 1.3 to 8.2).

130 EPIDEMIOLOGY OF SUICIDES IN RIO GRANDE DO SUL

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Objective: To profile the issue of suicide in the state of Rio Grande do Sul.

Methods: Suicide deaths were put together as case histories based on data from the Ministry of Health's mortality notification system. Suicides from 1980 to 1999 were grouped according to patterns from the OMS global population and after analysis using standard demographic variables.

Results: Rio Grande do Sul evidenced the highest rates for suicide in Brazil during the period under study (using proportional mortality and coefficients). The standardised coefficients went from levels around 9/100 000 in the 1980s to 11/100 000 in 1999. This increase in mortality is due mainly to the male population, where the figures went from 14/100 000 to the current 20/100 ,000. The male:female ratio increased from 2.5:1 to 4.4:1. The highest ratios corresponded to the elderly, although the ratio has been increasing in young adults as well. Widowed persons and farmers exhibit high mortality rates.

Conclusion: The study points to suicide as a collective health problem in Rio Grande do Sul and reveals characteristics that could contribute to preventative action. The monitoring of violent events in the community is one of the strategies in health promotion and allows the identification of potential factors for early intervention.

131 SOCIAL INEQUALITIES AND CANCER MORTALITY IN FRANCE, 1975–1990

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Introduction: European studies have shown that social inequalities in mortality are larger in France than in other countries. However, very few studies have been conducted in France, and all studies conducted on mortality by specific causes suffered from methodological problems due to the absence of direct linkage between socioeconomic data and causes of death.

Objective: To investigate social inequalities in cancer mortality among men and women in France during the period 1975–90, using data including a direct linkage with the French national death index.

Methods: We used a dataset including around 1% of the French population followed since 1968 at each French census. All men and women aged 35–59 years and who answered the 1975 census were included in this study. Subjects were followed until 31 December 1990. We considered both educational level and occupational class to characterise the socioeconomic status in 1975. The occupational class was coded according to the social class scheme of Erikson, Golthorpe, and Portecarero (EGP). Analysis was conducted using a Cox proportional hazards model.

Results: Large social inequalities in mortality were observed. For educational level, inequalities among men were more pronounced for pharyngeal (RR 9.2 for no diploma versus higher education), laryngeal (RR 6.2), oral cavity (RR 2.7), lung (RR 3.5), oesophagus (RR 3.1), stomach (RR 2.5), and rectal (RR 3.4) cancer mortality. No association between educational level and cancer mortality was observed for colon (RR 1.0) and lymphatic and haematopoietic tissue cancer (RR 1.0). Among women, social inequalities in cancer mortality were less pronounced but nevertheless observed for uterine (RR 1.9), stomach (RR 4.1), and lung (RR 1.6) cancer. No association was shown for breast (RR 0.8) and ovarian (RR 1.0) cancer mortality. Similar results were found for occupational class.

Conclusion: The analysis showed large inequalities in France in cancer mortality, and strong differences according to cancer site. The social differences in mortality are particularly pronounced for pharyngeal and laryngeal cancers. Further studies are needed to investigate the underlying mechanisms.

132 BIOCHEMICAL AND GENETIC DETERMINANTS OF HOMOCYSTEINE METABOLISM IN MOTHERS AFFECTED BY A NEURAL TUBE DEFECT PREGNANCY IN POLAND

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Background: Neural tube defects (NTDs) have been associated with biochemical factors involved in the conversion of homocysteine to methionine and with methylenetetrahydrofolate reductase (MTHFR) polymorphisms.

Methods: The prevalence of the C667T and A1298C MTHFR polymorphisms and their correlation with biochemical phenotype (serum folate, cobalamine, and total homocysteine (tHcy) and red blood cell folate) among spina bifida cases, their parents, and healthy controls were investigated. The sub-sample of 51 mothers of NTD offspring and 87 control women non-pregnant at the time of the interview who were

not supplemented with B vitamins was selected to determine differences in Hcy metabolism in mothers compared with women who had not given birth to a child with NTD.

Results: The distribution of the polymorphisms did not differ significantly between mothers and controls (p = 0.4 for both C667T and A1298C). Genetic analysis revealed homozygosity for the C667T polymorphism in 6% of mothers and 13% of controls and for the A1298C polymorphism in 6% of mothers and 3% of controls. Mean plasma folate levels were higher in mothers than in controls (9.7 versus 7.8 ng/ml, p = 0.03) and plasma cobalamine level did not differ significantly between groups. In mothers red blood cell folate was higher than in controls (421 versus 350 ng/ml, p = 0.2). The mean plasma tHcy level was significantly higher in mothers than in controls (10.1 versus 8.8 μmol/L, p = 0.001) but after stratification by tercile of plasma folate of the control distribution, the mean tHcy remained significantly different between mothers and controls only in the two lower terciles. In the logistic regression model having a tHcy level above the 75th centile of the control distribution was associated with an odds ratio (OR) of 3.3 (95% CI 1.6 to 6.8) for being a mother of NTD offspring. However, after estimation of separated models for three terciles of plasma folate concentration, the risk of being the mother of NTD offspring remained significant for the two lower terciles of folate level groups. In a subgroup with plasma folate concentration in the lowest tercile, having a tHcy concentration above the >75th centile conferred an OR for being an NTD mother of 6.9 (95% CI 1.6 to 30.9), while in the middle tercile of plasma folate OR was 4.8 (95% CI 1.1 to 19.9).

Conclusions: In the sample of Polish population studied, no association between MTHFR polymorphisms and greater risk of having an offspring with NTD was found. It seems that it is not folate insufficiency but rather the possible barriers to proper utilisation of folate and the teratogenic effect of homocysteine that are responsible for NTDs. That effect could be compensated by additional folic acid supplementation in mothers in the periconceptional period. A further research on genetic risk factors disturbing folate utilisation is needed.

133 OCCUPATIONAL RISKS FOR MYCOSIS FUNGOIDES: RESULTS FROM A CASE–CONTROL STUDY IN NINE EUROPEAN COUNTRIES

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Background: Mycosis fungoides (MF) is a T cell cutaneous lymphoma that starts off as plaques on the skin, which continue to the lymphatic nodes, affecting the spleen and other visceral organs. Its predominance in men, its start point after the age of 50–60 years, and the fact that it occurs quite rarely before this age, that it is not a family linked factor, and the frequent reports of patients previously having had dermatitis, led to us consider the role that occupational exposure plays in its development.

Material and methods: A European multicentre case–control study was conducted from 1995 to 1997, and included seven rare cancers, one of which was MF. Patients between 35 and 69 years of age who had been diagnosed with MF (n = 140) were recruited, and a reference pathologist, who classified 83 cases as definite, 35 cases as possible, and 22 cases as unaccepted, checked the diagnoses. Among the 118 accepted cases, 104 cases were interviewed, of which 76 were definite cases. We selected the control group from population controls and colon cancer controls to serve all seven case groups. Altogether 833 colon cancer controls and 2071 population control subjects were interviewed. The overall response rate was 91.5% for cases and 66.6% for controls. Odds ratios (OR), which were adjusted for matching variables (age, place of residence), were estimated by unconditional logistic regression. We performed a occupational matrix for Cr(VI) and its salts, and for aromatic, polycyclic, and/or halogenated hydrocarbons (APH)

Results: We observed that there is a greater risk of MF among workers exposed to the APH, in both men and women.

Conclusions: We suggest that chronic exposure to APH might be responsible for a chronic antigen immune stimulation, resulting in malignant lymphocyte clonality and giving rise to MF.

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134 EPIDEMIOLOGY OF CHRONIC PAIN IN BRAZIL: RESULTS OF A LARGE POPULATION BASED SURVEY

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Introduction: Chronic pain is a major health problem and an important cause of morbidity, causing considerable suffering and disability. Our understanding of the epidemiology of chronic pain remains limited as most studies available are based on clinic samples.

Objective: To quantify and describe the prevalence and distribution of chronic pain in Brazil using a population based study.

Methods: A random sample of 6579 individuals, aged 40 years and over, was drawn from two major cities in Brazil (São Paulo and Salvador) and surveyed by a face to face interview (response rate 76%). The standardised questionnaire included case screening questions, a brief pain inventory, a chronic pain grade questionnaire, a visual analogue scale (VAS) for pain intensity, and sociodemographic questions. Chronic pain was defined as continuous or intermittent pain for 3 months in the 6 months prior to interview. Migraine cases were excluded.

Results: The mean age of the 5000 participants (response rate 76%) was 54.5 years, and 56.6% were women. An overall chronic pain prevalence of 6.6% was found; 9.0% for women and 3.4% for men. Mean pain intensity on the VAS scale was 83 and 74 among women and men, respectively. Of the affected subjects, 39% reported to have chronic pain continuously and 25% very often. Backward stepwise logistic regression modelling identified age, sex, higher educational attainment, poor self rated health, and presence of chronic medical conditions as significant predictors of the presence of chronic pain. Medical treatment had been sought by 41% of the patients with chronic pain had sought medical treatment; 9% of them experienced no improvement and 13% had a complete response. One third of the patients with chronic pain reported they had lost 2 weeks or more of work in the previous 6 months, and 19% of men and 25% of women with chronic pain reported some degree of interference with daily activities caused by their pain.

Conclusions: Chronic pain is a major problem in the community and certain groups within the population are more likely to have chronic pain. A detailed understanding of the epidemiology of chronic pain is essential for efficient management of chronic pain in primary care.

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135 SUB-SITES OF COLORECTAL CANCER AND DEPRIVATION IN YORKSHIRE AND NORTHERN REGIONS OF THE UNITED KINGDOM

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Introduction: The global incidence of many cancers varies according to socioeconomic status. However, the direction and strength of these associations may be different between colon and rectal cancer.

Objective: To describe the variation in the incidence of colorectal cancer by anatomical subsites across the Yorkshire and Northern cancer registry and information service (NYCRIS) region and examine association with community level deprivation.

Methods: Incidence data were obtained from NYCRIS for the period 1976–2000. Using the anatomical site of the tumour (ICD-10) around 89 000 patients with colorectal cancer were grouped into proximal, distal, and rectal sites. Small areas were characterised by their levels of affluence/deprivation by deriving a Townsend score for each Enumeration District (ED) from the 1991 census. EDs were grouped into quintiles of the population by their Townsend scores. Age standardised incidence rates were calculated for quintiles, and Poisson and related regression models were used to investigate the association between affluence/deprivation and cancer.

Results: In men the age standardised colorectal cancer incidence rate ranged from 43.2/100 000 (most affluent) to 49.1/100 000 (most deprived). The age standardised rectal cancer incidence rate also increased with deprivation, ranging from 18.3/100 000 (most affluent) to 22.3/100 000 (most deprived), while the trend for proximal cancer was reversed (9.4 versus 8.8/100 000). Poisson and related models showed a weak significant positive association between deprivation level and colorectal cancer in both genders, particularly in men, with a rate ratio of 1.12 (95% CI 1.08 to 1.15) for the most deprived compared with most affluent quintile. Rectal cancer had a strong positive significant association with deprivation level in men with a rate ratio of 1.25 (95% CI 1.19 to 1.32) for the most deprived compared with the most affluent quintile. Cancer of unknown sites of colon also showed a significant positive association with deprivation in both sexes. In contrast there was an inverse association between deprivation level and proximal colon cancer in both genders, with rate ratios of 0.92 (95% CI 0.86 to 0.98) for the most deprived quintile in men and 0.90 (95% CI 0.84 to 0.95) in women compared with the most affluent quintile.

Conclusions: Overall, we found a positive association between colorectal cancer and deprivation. We also found the direction of association between proximal colon cancer and socioeconomic status to be the opposite of that found for rectal cancer. However, the opposite direction of proximal colon cancer with deprivation might be affected by some other factors like the unknown sites of colon cancer. It is likely that multiple lifestyle factors correlated with deprivation influence disease risk. These findings suggest that lifestyle risk factors for colon and rectal cancer differ, therefore the different sites of colorectal cancer should not be combined in aetiological studies.

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136 HEALTH RELATED QUALITY OF LIFE IN PATIENTS WITH HYPERCHOLESTEROLAEMIA

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Introduction: Hypercholesterolaemia (HC) is a major risk factor for cardiovascular diseases.

Objective: To describe health related quality of life (HRQoL) in patients with HC and to determine factors associated with HRQoL.

Methods: The present analysis is part of the ongoing ORBITAL study, a randomised controlled trial evaluating the long term cost effectiveness of a compliance enhancing programme in patients with HC requiring statin therapy according to Joint European Guidelines. At baseline, patients were asked about sociodemographic factors, lifestyle, cardiovascular risk factors, co-morbidity, resource utilisation, employment status prior to enrolment, and HRQoL. HRQoL was assessed with the generic Short Form (SF)-12 health status instrument and the Physical and Mental Component Summary (PCS-12, MCS-12) measures were calculated. Mean PCS-12 and MCS-12 scores of the German norm population are given for comparison. One way analysis of covariance models were used to determine factors associated with PCS-12 and MCS-12 scores.

Results: A total of 7598 patients (44% female, mean (SD) age 61 (11) years), were included in the study. Of these, 32% were employed at the time of inclusion, 18% had a history of myocardial infarction, 8% a history of stroke, 62% had hypertension, and 31% diabetes. The mean (SD) PCS-12 score was 43 (6) for all patients (German norm population 49 (9)) and the mean MCS-12 score 47 (11) (German norm population 52 (8)). A variety of factors were significantly associated with higher PCS-12 scores including male gender, higher socioeconomic status, employment status (yes versus no), a healthy lifestyle, a body mass index <25 kg/m^2, and the absence of diseases such as angina pectoris and cardiac arrhythmias. Factors significantly associated with higher MCS-12 scores were age ⩾ 65 years, type of employment (blue versus white collar worker), intake of fruits and vegetables at least daily, and the absence of cardiac arrhythmias.

Conclusions: In comparison with the German norm population, HRQoL is impaired in patients with HC. The long term effectiveness of healthcare programmes needs to be assessed in patients with this disorder, not only regarding clinical outcome and costs but also patient-based outcomes such as HRQoL.

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137 AGREEMENT OF FRAMINGHAM VERSUS SCORE BASED CARDIOVASCULAR RISK ESTIMATIONS: RESULTS OF THE 1998 GERMAN NATIONAL HEALTH INTERVIEW AND EXAMINATION SURVEY

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Introduction: Estimation of absolute risk of coronary or cardiovascular events with prediction models based on the Framingham heart study is

widely used in Europe. Recently, a new risk estimation model based on data from 12 European cohort studies (SCORE project) has been used for definition of high risk patients in the new European guidelines on cardiovascular risk prevention issued by the Third Joint Task Force of European and other societies on cardiovascular disease prevention.

Objective: To determine how well Framingham and SCORE based risk estimations agree in a representative sample of the German population with respect to discrimination of high risk patients and to magnitude of predicted risk.

Methods: We compared 10 year risk for fatal cardiovascular events in participants of the 1998 German National Health Interview and Examination Survey based on a Framingham versus SCORE model. SCORE based risks were calculated using both coefficients for high risk countries (SCORE-High, which is recommended for Germany) and for low risk countries (SCORE-Low). Inclusion criteria account for the recommendations for use of the models: age 30–74 years, and absence of cardiovascular disease, absence of markedly raised levels of single risk factors (total cholesterol $\geqslant$320 mg/dl, LDL cholesterol $\geqslant$240 mg/dl, blood pressure $\geqslant$180/110 mmHg) and absence of diabetes with microalbuminuria. A total of 3918 participants (1882 men and 2036 women) were eligible for analysis. High risk was defined as 10 year risk of fatal CVD $\geqslant$5% now or if extrapolated to 60 years of age according to the new European guidelines.

Results: Framingham based estimates yielded the same risk group allocation as SCORE-High in 92.4% of women and 71.2% of men (kappa 0.61 and 0.44). Framingham and SCORE-Low allocated 96.6% of women and 77.5% of men to the same risk group (kappa 0.73 and 0.54). Modifying the risk group definition by leaving out the extrapolation to 60 years improved also in men agreement of risk group allocation between Framingham and both SCORE variants to over 90%. SCORE-High predicted 109 fatal events in our sample, Framingham 75, and SCORE-Low 54. In most age groups and for men and women mean SCORE-High risk was highest, followed by Framingham, and by SCORE-Low.

Conclusions: Framingham and SCORE based cardiovascular risk estimations show good agreement in women but only moderate individual agreement in men with regard to risk group allocation. Especially in men, this agreement is sensitive to extrapolation of risk to 60 years of age. Mean predicted risks differ considerably according to the risk function used, the SCORE variant recommended for Germany (SCORE-High) yielding the highest estimates. As a recent study showed that the Framingham risk function, which we used, overestimated coronary heart disease risk in two German cohorts (PROCAM and MONICA Augsburg), our results suggest that SCORE-High may overestimate absolute risk at the population level in Germany.

138 PATERNAL AGE AND RISK OF FETAL DEATH

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Introduction: Age at reproduction has increased dramatically in Europe during the last decades. Fetal mortality has usually been studied according to the characteristics of the mother, and many studies have shown a significant impact of the biological characteristics of the mother, most importantly maternal age. Studies of paternal age effects on fetal loss are rare, and face several methodological problems, such as selective fertility, a strong correlation between maternal and paternal age, and the fact that routine registrations on fetal loss seldom include information on paternal age. However, paternal ageing may increase the risk of point mutations in the sperm and thus influence fetal survival.

Methods: The study is a prospective cohort study of 23 821 pregnancies recruited consecutively to the Danish National Birth Cohort. The women were interviewed about obstetric history, exposures in pregnancy, and sociodemographic background factors, and the pregnancies were followed up regarding outcome of pregnancy. Paternal age was obtained by record linkage with the Central Person Registry, which contains information on identity (and age) of fathers of all live born children. Furthermore, the participating pregnant women's husbands or cohabitants at time of conception were traced to identify the fathers of pregnancies ending in fetal loss. The paternal age related overall risk of fetal death and early and late fetal loss were estimated by using Cox regression, taking maternal age, obstetric history, and lifestyle during pregnancy into account. The relationship between maternal and paternal age was examined, identifying possible problems with co-linearity in the data material. Possible residual confounding by maternal age was adjusted for in 5 year intervals, 1 year intervals, and by

including the shape of the effect of maternal age as a variable in the model.

Results: Pregnancies fathered by a man aged 50 years or more at the time of conception have almost twice the risk of ending in a fetal loss compared with pregnancies with younger fathers (hazard ratio (HR) 1.88, 95% CI 0.93–3.82). Various approaches to adjustment for potential residual confounding of the relation by maternal age did not attenuate the relative risk estimates substantially. The paternal age related risk of late fetal death was higher than the risk of early fetal death (HR 4.56, 95% CI 1.39 to 14.94). Results should, however, be interpreted cautiously because of the restricted number of late fetal deaths.

Conclusions: High paternal age seem to contribute to the risk of fetal death.

139 A COMPARISON OF SOCCER, GAELIC FOOTBALL, AND RUGBY INJURIES IN 409 CHILDREN UNDER 17 YEARS PRESENTING TO AN EMERGENCY MEDICINE DEPARTMENT OVER A 6 MONTH PERIOD

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Background: In the Irish sporting arena, participation by children in soccer, rugby, and Gaelic football is increasing in popularity. As a result, sport related injuries (SRIs) are common. A comparison of the demographics of injuries in these three physical contact ball sports in Irish children has not previously been adequately performed, as reflected by the paucity of publications in the medical literature.

Objectives: To provide up to date demographic information on the nature of these SRIs using a cross sectional study

Materials and method: Data were collected on all children (<17 years of age) injured in these three sports, presenting to an emergency department of a major teaching hospital over a 6 month period. The data, which included sport, age, sex, cause, type, site, and management, were entered into a specially designed database.

Results: Retrospective analysis was performed on 23 000 charts, and 409 SRIs were identified over a 6 month period. Soccer injuries presented most frequently (56%), followed by Gaelic football (24%) and rugby (20%) injuries. Overall, injured males presented more frequently (82–93%), and were 0.5 years older than their female counterparts in each of the three sports. In the 5–8 and 9–12 year age groups, soccer and Gaelic football injuries predominated, but in the 13–16 year age groups, rugby injuries predominated. The predominant mechanism of injury was different in each sport: in soccer these were falls (38%), in Gaelic football, collisions with football (37%), and in rugby, collisions with persons (55%). Upper limb injuries predominated in all three sports, but were the commonest injury in Gaelic football (66%). Lower limb injuries were more common in soccer (35%), and head (14%) and trunk (9%) injuries were more common in rugby. Fractures were the commonest type of injury in soccer (50%) and Gaelic football (42%), and soft tissue injuries were the commonest type of injury in rugby (44%). Plain x rays were performed in 91% of cases, with 48% revealing fractures. Analgesia was required by 50% of cases, 8% required admission, and 82% required follow up. No documented use of protective gear or preventative advice was recorded for any of the SRIs seen.

Conclusions: This is the first reported study to compare injury in these three physical contact ball sports. The data provided from this study may raise awareness of the nature of SRIs affecting children in each of these sports, and should be helpful in formulating much needed injury prevention strategies.

140 PROFILE OF VICTIMS OF VIOLENCE IN A HEALTH BOARD REGION IN IRELAND WHO REQUIRED EMERGENCY HOSPITAL ADMISSION 1997–2001: THE INCREASING ASSOCIATION WITH DRUNKENESS

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Introduction: Alcohol consumption has increased significantly in Ireland during the last 5 years. Excessive alcohol consumption increases the risk of assaults and violence. Studies have shown that drunkenness is not only a risk factor among perpetrators of violence but is also a risk factor among victims of violence.

Objective: To see if alcohol intoxication was recorded among victims of violent incidents who required emergency hospital inpatient admission.

Method: All emergency admissions related to ''homicide and injury purposely inflicted by other persons'' (ICD-9 codes E960–E969 inclusive) by residents in a health board region were extracted from the Hospital Inpatient Enquiry (HIPE) database for the years 1997–2001. The HIPE database includes data on all hospital inpatient admissions. The data were analysed in the JMP statistical package. Age standardised rates were calculated using StatsDirect.

Results: There was a total of 1451 emergency hospital admissions due to violence, with more admissions occurring at the weekend (76.2% versus 23.8%, p<0.001). Over 13.5% of all the admissions were drunk on admission (had a diagnosis of acute alcohol intoxication, ICD Codes 303.0 and 305.0 also recorded on their HIPE record). There was no significant difference in the number of men and women presenting drunk (14.0% versus 0.3%, p<0.14). The age adjusted hospital admission rate resulting from patients presenting with violence related injuries whilst drunk was significantly higher in 2001 than in 1997 (12.6/100 000 population versus 5.8/100 000 population, p<0.001). The men presenting were significantly younger than the women (28.5 versus 30.3 years, p<0.04), and the most common age group 20–24 years.

Conclusion: This study shows that the increase in drink related violence hospital admissions mirrors the increase in alcohol consumption over the same time period. This study reinforces the need to tackle the increasing positive association between alcohol and violence in Irish society.

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141 **INCOME INEQUALITIES AND DISABILITY IN OLDER BRAZILIANS**

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Introduction: Socioeconomic differences in disability prevalence in old age have been reported from the US, Europe, Japan, and more recently, also from Brazil. Brazil is exceptional in having extreme income inequalities, and provides an opportunity to identify whether there are threshold levels of income above which gains in disability reduction are relatively small.

Objective: To analyse income inequalities in disability among the elderly in Brazil, using the family income per capita as a marker, weighted through an equivalent scale (OECD modified).

Subjects and methods: Data used in this study came from the 1998 National Household Survey (PNAD/1998), conducted by the Brazilian Institute of Geography and Statistics. The study involved a nationally representative sample of 28 943 people aged 60 years or over. Difficulty in walking more than 100 metres, a measure of moderate disability, was taken in this study as a proven marker with prognostic value for disability progression in older people. The data were analysed in SPSS v.10 and the statistical procedure used was multivariate analysis, with the proportion of elderly people with difficulty walking more than 100 metres as the dependent variable, controlling by gender, age, and region of residence, education, and urban/rural residence.

Results: The prevalence of difficulty in walking more than 100 metres for elderly people below the median of the family income per capita was 23.2 for men (95% CI 21.0 to 25.4) and 34.5 for women (95% CI 32.7 to 36.3), decreasing in the richest elderly group (90th centile) for 9.9 (95% CI 4.7 to 15.1) and 18.1 (95% CI 13.6 to 22.6), respectively. Even for those elderly in the highest income group (95th centile), disability prevalence rates decreased when the value of family income increased.

Conclusions: In developed countries, there is evidence of a gradual reduction in the disability prevalence rates among the elderly over recent decades. For the 16 million of elderly people in Brazil, functional impairment occurs in a context of poverty and extreme social inequalities. Reducing the burden of disability in the older population of Brazil is likely to require reduction in income inequalities and improvements in institutional support.

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142 **ASSOCIATION BETWEEN SOME HABITS AND MULTIPLE SCLEROSIS: A CASE–CONTROL STUDY IN BELGRADE**

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Introduction: The putative role of risk factors for multiple sclerosis (MS), such as tobacco, alcohol, coffee, and tea consumption, and physical activity has been evaluated only through several epidemiological studies so far, but with contradictory results.

Objective: To analyse the role of some habits (cigarette smoking, alcohol, coffee and tea consumption, and physical activities) as environmental risk factors for MS in the Belgrade population using a case–control study.

Methods: The study group consisted of 110 cases with clinically and/or laboratory supported MS according to the Poser's criteria, in whom onset symptoms occurred up to 2 years prior to the interview. The same number of controls, individually matched by sex, age, and area of residence, was recruited from patients with various non-autoimmune neurological disorders. Statistical analysis included conditional univariate and multivariate logistic regression models.

Results: Subjects with MS were smokers significantly more frequently than controls (odds ratio (OR) 1.81, 95% CI 1.06 to 3.21, p=0.031). For smokers who had smoked for ≥21 years (OR 2.38, χ^2 test for trend=6.291, p=0.012), and for those who smoked ≥11 cigarettes/day (OR 2.13, χ^2 test for trend=6.236, p=0.012), the risk increased significantly over twofold. Coffee consumption was significantly more frequent in the study group than in the control group (OR 2.28, 95% CI 1.07 to 5.17, p=0.032), and the risk of MS significantly increased with the length of the period of coffee consumption (χ^2 test for trend=3.885, p=0.048). The analysis of alcohol drinking showed a significant association between spirit consumption and MS compared with drinking of wine and beer (OR 3.78, 95% CI 1.06 to 13.45, p=0.040). According to the multivariate analysis the consumption of spirits (OR 6.86, 95% CI 1.42 to 33.0, p=0.016) and the practice of sports (OR 2.61, 95% CI 1.09 to 6.23, p=0.031) were significantly related to MS, and an inverse association was found for tea consumption (OR 0.18, 95% CI 0.03 to 0.99, p=0.049).

Conclusions: The findings obtained in this study support the a possible role of certain habits such as cigarette smoking, alcohol and coffee consumption, and physical activities, in addition to the other factors, in the occurrence of MS in this environment.

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143 **PREVALENCE AND SOCIAL DETERMINANTS OF BREASTFEEDING**

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Introduction: The pattern and duration of breastfeeding are influenced by many social factors and constitute important determinants of health.

Objective: To quantify the prevalence of breastfeeding and to identify the main social determinants of initiation and duration from birth until 4 months.

Methods: Mothers consecutively admitted from June to September 2003 in obstetric departments of S. Teotónio Hospital of Viseu constituted the sample. On the third day after delivery, 661 mothers completed a self administered questionnaire with questions about breastfeeding situation and social variables. At the fourth month a telephone contact was carried out with the objective of measuring the prevalence and duration of breastfeeding. Only 621 mothers could be contacted by telephone; 20 were not available. The χ^2 test was conducted to compare the proportions. Crude odds ratio (OR) with a 95% confidence interval was used to measure the strength of the associations for weaning at the second month.

Results: The prevalence of exclusive breastfeeding on the third day of life was 94.1% (95% CI 92.1 to 95.7), after 1 month it was 82.2% (95% CI 79.1 to 85.0), after 2 months 71.8% (95% CI 68.2 to 75.4), after 3 months 59.4% (95% CI 55.6 to 63.2) and after 4 months 34.9% (95% CI 31.3 to 38.7). Weaning at the second month was associated with the mother's age (<20 years OR 2.1; 95% CI 1.2 to 13.6), mother's occupation (manual OR 2.2; 95% CI 1.3 to 3.9), multiparity (OR 1.6; 95% CI 1.1 to 2.3), marital status (singled/divorced OR 1.9; 95% CI 1.0 to 4.3) and mother's professional situation (employed OR 1.5; 95% CI 1.0 to 3.1).

Conclusion: We found a higher prevalence of exclusive breastfeeding at the third day after delivery. Duration of breastfeeding was shorter in children of younger women, mothers with manual occupation, and in multiparous, singled/divorced, and employed women.

144 | PREVALENCE OF ABNORMAL EATING BEHAVIOURS IN ADOLESCENTS

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Background: Eating disorders are common in adolescents and are associated with important psychiatric morbidity.

Objective: To quantify the prevalence of abnormal eating behaviours in a Portuguese community sample of adolescents.

Participants and methods: In a cross sectional study we evaluated the eating attitudes and the prevalence of eating disorders in a sample of 2144 students (1105 females) aged 12–18 years (mean (SD) 14.8 (1.70)), among seven secondary schools from Viseu. Participants were surveyed according to the Portuguese Validated Eating Disorder Inventory (EDI2) and questions about socioeconomic and demographic situation. We considered a score of 4 points as the cutoff for bulimia.

Results: Lifetime prevalence of any eating disorder was 8.3%, significantly higher in females (13.2 versus 3.2, p<0.01). The prevalence of full syndrome anorexia nervosa in the total sample was 1.0%, and partial syndrome was 7.6%, significantly higher in females (12.8 versus 2.5, p<0.01). Prevalence of bulimia in the past year was 0.8%, and of binge eating disorder was 2.9%. Point prevalence of body dissatisfaction was 10.9%, significantly higher in females (17.6 versus 3.7, p<0.01). Current dieting was more prevalent in girls (28.2%) than in boys (8.9%). Laxative or diuretic use was reported by 1.0% and self induced vomiting by 0.9% of total sample.

Conclusion: This study show higher prevalence of abnormal eating behaviours in adolescents. Educational programmes among children and adolescents will be considered, aimed at preventing abnormal eating behaviours and related morbidity.

145 | SOCIOECONOMIC POSITION AND MORTALITY IN RUSSIA

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Introduction: Since the fall of communism in Russia in 1991, mortality has fluctuated dramatically. Mortality has increased most in middle aged people, men, and those with less education, and poor self reported health is also commoner in people with lower education and income. Education and income are less closely correlated than in Western societies.

Objective: To study prospectively the associations of different socioeconomic measures with mortality using one of the very few longitudinal studies in Russia.

Methods: The Russia Longitudinal Monitoring Survey is a panel survey of households and individuals from centres across Russia. We analysed data from seven rounds between 1994 and 2002. We included subjects aged 18 years and over with individual and household data available for the round of entry and at least one subsequent round. Household members reported deaths. We explored the associations between several socioeconomic measures and mortality using Cox regression. These variables were education, whether goods were sold for money, and household and individual income quintiles. Incomes were adjusted to the value of the 1992 rouble. We then explored the influence of health behaviours (smoking and alcohol), self reported health and other socioeconomic factors on these associations.

Results: In the final analysis, 13 455 participants (5950 males and 7505 females) were included. Participants spent a mean of 4.06 years in the study. There were 845 deaths (488 males and 357 females) reported. Health was described by 17% of respondents as poor or very poor at entry. Of the participants, 47% had higher education, 3% had sold goods for money. After adjusting for age, mortality was significantly lower in men and women with greater than secondary education (0.75 (0.58 to 0.97) men, 0.42 (0.29 to 0.62) women) and higher in men with less than secondary education (1.80 (1.40 to 1.31)). Mortality was significantly higher in men (1.66 (1.08 to 2.51)) and women (1.91(1.14 to 3.21)) who had sold goods for money, and significantly lower in both sexes in the highest individual income quintile and in men in the second highest quintile compared with the middle individual income quintile. Household income was only weakly related to mortality. The relationships with education, income, and selling goods to mortality persisted after adjusting for smoking, alcohol intake, and initial self reported health (poor self reported health, smoking, and frequent alcohol consumption were each independently significantly associated with increased mortality). After adjusting for other socioeconomic and behavioural factors, only the relationship with education remained significant.

Conclusions: Overall education was most strongly associated with mortality, a relationship not fully explained by initial health, socioeconomic factors, and health behaviours. This is consistent with the findings of others. Education can influence health independently of its financial rewards. Relationships here between smoking, education, poor self rated health, and mortality are consistent with other studies, which supports the validity of these mortality data.

146 | THE MEASURE OF QUALITY OF LIFE IN A RETIRED POPULATION IN TWO COUNTRIES OF CENTRAL AND EASTERN EUROPE: CASP-19

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Introduction: CASP-19 is a new measure of quality of life (QoL) among individuals in early old age developed in the last several years and piloted mostly in the United Kingdom.

Objective: To examine whether this new measure could be a useful tool to study quality of life in retired populations of Central and Eastern Europe.

Methods: The data come from the baseline survey of the prospective HAPIEE Study currently conducted in Central and Eastern Europe. Although data collection is still in progress, data were available on 1993 randomly selected retired individuals (800 men and 1193 women) from the Czech Republic and Russia aged 55–70 years for this analysis. The sample of men and women completed a questionnaire and underwent a short medical examination. Participants were asked about their health, quality of life, socioeconomic and psychosocial conditions, and health behaviours.

Results: The CASP-19 questionnaire consists of 19 items; each of them is rated on the 4 point Lickert scale. CASP-19 scores range from 0 (low QoL) to 57 (high QoL). Mean values of CASP-19 were significantly higher for the Czech population than the Russian (36.7 compared with 33.5 for men, and 36.6 compared with 31.3 for women), and the mean values were higher for men in both countries. The scores were distributed along the whole range. The distribution was slightly skewed towards the higher values. Cronbach's alpha coefficient of internal reliability was 0.84. CASP-19 consists of four domains: control, autonomy, self realisation, and pleasure. Correlations between the four domains ranged from 0.33 to 0.58. Cronbach's alphas for the domains ranged from 0.53 to 0.74. Subsequent analysis showed that CASP-19 values were significantly influenced by age, socioeconomic factors (education, material deprivation, number of household items), and health conditions. The difference between the Czech and Russian subjects remained significant in the fully adjusted model (difference 3.7 points, 95% CI 2.7 to 4.6).

Conclusions: These results coincide with previously published results on British populations and confirm that CASP-19 can be a useful measure of quality of life in retired populations.

147 | BARRIERS FOR IDENTIFYING AND NOTIFICATION OF CHILD ABUSE BY PAEDIATRICIANS FROM PORTO ALEGRE, BRAZIL

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Introduction: Mandatory notification of child abuse in Brazil was instituted in the beginning of 1990s through the Child and Adolescent Statute (ECA). According this law, all suspected violence against children or adolescents must be obligatorily notified to protection organisations. However, no quantitative study in Brazil has investigated the incidence of identification and notification by paediatricians of child abuse cases and the factors related to these.

Objective: To determine the risk factors for paediatricians not notifying identified child abuse cases to child protection services.

Methods: This was a cross sectional study carried out in Porto Alegre, Southern Brazil. A randomised sample of paediatricians was collected from records of the local paediatric association. Professionals who have changed their practice area, changed city, retired, or died were excluded from this sample. Sociodemographic variables, position and graduation backgrounds, and knowledge and behaviour regarding to child abuse were obtained by means of an anonymous questionnaire and related to not notifying a child abuse case. After a descriptive

analysis with a confidence interval of 95%, a logistic regression model performed a multivariate analysis in order to determine the risk factors for not notifying. The sample size was calculated to demonstrate an incidence of around 20% not notifying.

Results: From 990 eligible paediatricians, 129 were selected. Of these, 33 were excluded and 92 replied to the questionnaire. From them, 80 (86.9%) identified at least one case of child abuse and 63 (78.7%) notified at least one of these cases. Most of paediatricians showed a level of knowledge regarding child abuse from adequate to sufficient, a low level of reliability in PCIs, and 90% revealed a fear of being involved in legal prosecution. Low level of knowledge (odds ratio (OR) 30.5, CI 2.88 to 324.7), exclusive work in the private sector (OR 4.6, CI 1.01 to 20.9), and reports of suffering child abuse themselves (OR 4.9, CI 1.00 to 20.9) were risk factors for not notifying a identified case of child abuse.

Conclusion: This study pointed out a high rate of identification and notification of child abuse by paediatricians. In order to increase the number of notified cases of child abuse, some measures could be implemented, such as stimulating continuous education programmes regarding prevention of child abuse, improving child protection institutions, and expanding the professional support system, particularly for paediatricians in private sector.

148 SURVEILLANCE OF EXPOSURE TO ENVIRONMENTAL POLLUTANTS USING BIOMARKERS IN TWO HEALTH AREAS OF MADRID: A PILOT STUDY

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Introduction: Environmental surveillance in Madrid is performed through the analysis of different pollutants in atmospheric air, water, and foods. In order to investigate the real impact of environmental toxicants in humans, a new surveillance system using biomarkers in different human tissues has been designed. In order to study the feasibility of the new approach, a pilot study is being carried out in two of the 11 health areas of Madrid. In one of the areas, there is public concern about the possible health impact of its industrial activity, and the other was selected as a less exposed reference. Here we present the design and preliminary data of this study.

Methods: The study population includes a sample of 150 trios, formed by mother, father, and newborn, treated at two public maternity hospitals. Participation in the study was first offered to pregnant women attending birth preparation sessions and their partners. Parents were excluded if: they were living in these areas for less than 1 year; mothers were younger than 16 years, and when the pregnancies were twin/multiple. Information on socioeconomic characteristics, environmental exposure, occupation, tobacco consumption, diet, and medical history was obtained through a structured questionnaire. For women, gynaecological history was also recorded. Data about newborns were collected at the hospital by trained personal. Heavy metals (As, Hg, Pb and Cd), PCBs, DDTs and HCH were measured in blood from parents and newborns (cord blood). Dioxins, furans, and dioxin-like PCBs were measured in pooled samples of blood from parents and maternal milk samples; endocrine disrupters were analysed in placenta and metal Hg in newborns' hair. Chromosome damage was evaluated using the CB micronuclei assay in parents and children. Finally, 1-hidroxy-pyrene was measured in urine samples from parents.

Results: Currently (February 2004), after signing the informed written consent, 132 couples have already been recruited. Blood and urine samples have been collected from 91.6% of them. At the moment, a total of 76 children have been born. In almost all cases, placenta, cord blood, hair and breast milk samples have been gathered. The participation rate is rather low, around 26%, and 90% of the participants are Spanish. No differences have been found regarding age, socioeconomic level, or country of origin in both areas. Recruitment will be finished in May 2004.

Conclusions: This study will estimate the background level of main pollutants in people leaving in Madrid, assessing different biological samples. The pros and cons of this strategy will be discussed in order to set-up an environmental surveillance system.

Other researchers in Madrid Biomarkers: J.-C. Sanz, P. Arias, M. Cisneros, J.-F. García, G. López-Abente, B. Pérez-Gómez, A. de León, J.-M. García-Sagredo, M. J. González, M. Fernández, and Á. Asensio.

149 DETERMINANTS OF PROGNOSIS IN METASTATIC BREAST CANCER

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Introduction: Women with metastatic breast cancer have a poor prognosis. However, the clinical course of these patients varies greatly.

Objective: To evaluate determinants of prognosis in patients with metastatic breast cancer using a case–control study.

Methods: All patients recorded in the population based Geneva Cancer Registry between 1977–1996 with a diagnosis of breast cancer presenting with distant metastasis were included in the analysis. Cases were patients alive 5 years after the diagnosis of metastatic breast cancer (n=40). Controls were all other patients (n=300). Patient characteristics (age, marital status, birth place, socioeconomic status, period of diagnosis, menopausal status, previous or concomitant cancer), tumour characteristics (morphology, tumour size, quadrant, grade, number of involved lymph nodes, oestrogen and progesterone receptor status, sites of metastasis, and number of sites involved), and treatment related variables (surgery, hormone therapy, chemotherapy, radiotherapy, surgical margins) were evaluated as possible prognostic determinants. Sites of metastasis were defined as visceral (lung, liver, pleura), soft tissue (lymph nodes, skin, subcutaneous masses), central nervous system, and bone. Odds ratios (ORs) and 95% confidence intervals (95% CIs) were determined by logistic regression analysis.

Results: The overall median survival was 15 months. Multivariate logistic regression analyses showed that cases were more likely than controls to have oestrogen receptor positive tumours (OR 3.8; 95% CI 1.1 to 12.9), to have been treated with hormone therapy (OR 2.5; 95% CI 1.1 to 5.5), and to have soft tissue metastases (OR 2.6; 95% CI 1.1 to 6.3). Conversely, cases were less likely to have visceral metastases (OR 0.5; 95% CI 0.2 to 1.0). The interaction term between oestrogen receptor status and use of hormone therapy was not statistically significant. The other patient or tumour characteristics were not significantly linked to the prognosis in the multivariate model.

Conclusions: This study confirmed that oestrogen receptor positive tumours, metastasis of the soft tissues, and use of hormone therapy are indicators of better prognosis in metastasic breast cancer, whilst the presence of visceral metastasis is a poor prognostic factor.

150 YOUNG AGE AT ADIPOSITY REBOUND IS STRONGLY ASSOCIATED WITH THE RISK OF OVERWEIGHT AND OBESITY IN ADOLESCENCE: THE COMPASS STUDY

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Introduction: The shape of the body mass index (BMI) curve in early childhood and preschool age may predict the risk of obesity and other components of the metabolic syndrome in later life.

Objective: To investigate whether age at lowest BMI in preschool age (adiposity rebound) is associated with BMI, waist circumference, fat mass and blood pressure at age 15 years.

Methods: A population based cohort of 2650 children from Stockholm was followed prospectively from birth to 15 years of age with respect to height and weight. BMI, fat mass, waist circumference, and blood pressure were measured at 15 years of age. A third order polynomial model was fitted to the BMI curve and the age of adiposity rebound was identified. Overweight and obesity were defined according to the International Obesity Task Force, and fat mass was assessed by bioelectric impedance.

Results: Girls with normal weight, overweight and obesity had adiposity rebound at age 5.5, 4.0, and 2.8 years. Boys with normal weight, overweight and obesity had adiposity rebound at age 5.8, 4.9, and 4.0 years. Children in the highest tertile of fat mass (or waist circumference) at 15 years of age had adiposity rebound 1 year earlier than those in the lowest tertile of fat mass (or waist circumference). No difference in mean age at adiposity rebound was present between children in the highest and the lowest tertile of blood pressure at 15 years of age.

Conclusion: Adiposity rebound at a young age is a strong predictor of the risk for overweight and obesity in later life. No association was found between age at adiposity rebound and blood pressure in adolescence.

151 ROUTINELY COLLECTED LABORATORY DATA IN RENAL DISEASE EPIDEMIOLOGY: COVENTRY RENAL FAILURE PROJECT

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Introduction: Renal disease is an important clinical and public health problem, with significant impact on individuals and demand for NHS resources for management. Not all individuals with renal impairment are under specialist care and understanding the epidemiology is complicated by the difficulty of accessing complete data. Serum creatinine measurement is a routinely undertaken test from which creatinine clearance and renal dysfunction can be estimated.

Objective: To investigate the feasibility of using laboratory investigations database to investigate aspects of renal disease in Coventry.

Methods: Data were extracted from a computerised central laboratory system for a defined geographical area, and anonymised. Patients were included if between 1 June 2000 and 31 May 2003 they had one or more serum creatinine measurement: first, last, and highest other results were recorded. Patients in the genitourinary medicine department were excluded, as were those not resident in Coventry. Duplicated records were amalgamated as appropriate. Ethnicity was self reported and name based using the Nam Pehchan software where appropriate. Year of death was recorded and patients seen by a nephrologist were identified. Creatinine clearance was estimated using a modified Modification of Diet in Renal Disease (MDRD) formula.

Results: A total of 117 824 patients were identified over the 3 years, representing approximately 39% of the Coventry population (300 848 at 2001 census). There were 63 620 (54%) female, 52 013 (44%) male and 2191 (2%) gender not recorded. Ethnic group distribution was white (99 618; 85%), South Asian (SA) (15 883; 14%), black (1350; 1%), and other (973; 1%). Elevated serum creatinine (μmol/l) was recorded for 7280 ($\geq$150; 6%). Creatinine clearance defined renal failure ($<$15 ml/min) was present in 790 (0.7%) patients, with severe renal dysfunction (15 to $<$39 ml/min) observed in 6149 (5%) patients; 501 (63%) and 1561 (25%) of these patients respectively had seen a nephrologist. During the 3 years, 7676 (7%) patients died; patients with either renal failure (RR 13.5; 12.6 to 14.4) or severe renal impairment (RR 10.2; 9.8 to 10.6) were significantly more likely to die than patients with normal renal function.

Discussion: Using routinely collected laboratory data provides useful epidemiological data about renal disease in a defined area. Patients with renal failure and severe renal impairment were more likely to have been referred to specialist services and to have died than those with mild or no impairment. Routinely collected data may be useful to identify patients who have not been but should be referred for specialist renal evaluation.

152 PARENTAL VIOLENCE AND THE OCCURRENCE OF SEVERE AND ACUTE MALNUTRITION IN CHILDHOOD

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Introduction: Over the years, several risk factors for severe acute malnutrition (SAM) have been identified. Yet, notwithstanding their adequacy for backing up intervention strategies, they may no longer be sufficient to explain an emerging new profile following a worldwide decline of SAM. Although there are studies proposing links with child underdevelopment, the relationship has never been directly investigated through an epidemiological study.

Objective: To explore the role of intimate violence within couples (parents) as an independent risk factor for SAM in children.

Methods: A hospital based case–control study was carried out from 1996 through 1999 in six major paediatric hospitals of Rio de Janeiro. Cases (n = 172) comprised (a) children aged 1—24 months; (b) whose mothers had had partners in the preceding 12 months; and (c) admitted with confirmed SAM (weight fo height z scores $\leqslant$ 2SD of the NCHS standard). Controls (n = 345) were children who met conditions (a) and (b) and were admitted for non-traumatic surgeries. The Revised Conflict Tactics Scales was used to gauge couple violence. Three conflict resolution strategies were considered: verbal, minor physical, and severe physical aggression. Three perspectives were taken: (a) considering an event as positive if at least one item had been perpetrated by either member of the couple (type V1 binary variables);

(b) scores (type V2 ordinal variables); and (c) classifying couples according to the most severe strategy used to deal with a conflict (type V3 composite variable). The following factors were also studied: household conditions and assets, number of children under 5 years in the household, maternal education, suspicion of parental alcohol and/or illicit drug abuse, low birth weight, birth order, and birth interval from the next eldest sibling. Unconditional logistic regression analysis was performed. Statistical and change in point estimate criteria guided the modelling process.

Results: The analysis using the V1-type variables showed that the chance of SAM in children living with extremely aggressive parents was around 2.5 times that of children living with parents who are not, whereas VA posed no risk for malnutrition. The V2-type variables implied an increasing risk of malnutrition as aggression between the parents intensified. Contrasting extreme violence cases entailed adjusted odds ratios of 3.01 (95% CI 1.33 to 6.85), 3.45 (95% CI 1.39 to 8.58) and 3.79 (95% CI 1.57 to 9.10) for the verbal, minor physical, and severe physical aggression, respectively. The V3-type variable showed that an increased risk of SAM concerned only children living in households where severe physical aggression was taking place (adjusted OR 2.80; 95% CI 1.19 to 6.58).

Conclusion: The study highlights the importance of other than traditional processes leading to SAM and that the phenomenon is not just associated with any type of parental violence, but rather with severe and somewhat recurrent events. These findings point to a single population group requiring rigorous public health targeting, especially in terms of accurate family detection, appropriate handling, and follow up.

153 SOCIAL INEQUALITIES AND TRENDS IN CHILDHOOD LEUKAEMIA MORTALITY IN BRAZIL, 1980–2000

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Introduction: Mortality from childhood cancers has shown substantial declines in developed countries. These trends can be often attributed to changes in leukaemia mortality rates.

Objective: To describe mortality trends in childhood leukaemia in Brazil from 1980–2000 and the impact of social inequalities on them.

Methods: Cancer death certification data by cause and estimates of resident population, stratified by age and sex were obtained from the Brazilian Mortality Information System (SIM) from 1980–2000. Age standardised (0–19 years) mortality rates were derived by the direct method using the 1960 world population as standard. Trends were modelled by use of linear regression models, with 3 year moving average rate as the dependent variable and the midpoint of the calendar year interval (1990) as the independent one. The Index of Social Exclusion, ranging from 0 (worst) to 1 (best), was used to classify Brazilian states, being composed of six indicators: poverty, employment, inequality, school years, literacy, young population, and violence. Pearson correlation was utilised to verify the correlation between social exclusion and variations in mortality in each state.

Results: Age standardised mortality rates among the boys decreased from 2.05/100 000 habitants in 1984 to 1.44/100 000 in 1995, whereas the observed corresponding decline among girls was from 1.60/100 000 habitants in 1986 to 1.14/100 000 in 1995. Statistically significant declining trends in mortality rates were observed for boys (r^2 adjusted = 0.70, $p<0.001$) and girls (r^2 adjusted = 0.75, $p<0.001$). Significant negative correlation between social inequality and changes in mortality was noted for both males (r = -0.55, p = 0.003) and females (r = -0.60, p = 0.001). In the nine states significant increases in mortality were found. For all except one, this finding may be related to corresponding decreases in mortality from ill defined signs and symptoms.

Conclusions: Consistent decrease in mortality rates from childhood leukaemia was noted in Brazil. Higher decreases in mortality were observed in more developed states, possibly reflecting better healthcare.

154 GIS INTEGRATION IN NEPHROLOGY: A SIGNE

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Introduction: In France, the prevalence of end stage renal disease (ESRD) is not precisely known, and consequently, the offer of care is ill

adapted to meet the demand. In order to increase medical, epidemiological and organisational knowledge of ESRD, a Multi-Source Information System (MSIS) has been set up as a part of the Renal Epidemiology and Information Network. The SIGNe programme relies on these applications. It is aimed at representing geographical distribution of healthcare offer and demand for ESRD treatment, necessary for better public health decision making.

Methods: The MSIS application collects data concerning the demand supply of care to patients, which are then integrated into a data warehouse. Quality and exhaustivity controls are carried out initially inμeach region. The SIGNe uses geographical information system (GIS) and Web mapping technologies with regard to ESRD. These methods allow construction of an informational support for querying the geographical ESRD datasets, the association of results with external datasets (demographical data), and the visualisation of maps in a well known geographical context (such as administrative boundaries and roads).

Results: The application has been developed for the test region Limousin. An interactive atlas was put on line, providing set of maps displaying the health units of care and patient distributions in different areas: spatial (such as region, health territories), and temporal (year, month) and take into account co-morbidities (age, diabetes, ESRD treatments). The different agencies involved in ESRD treatment now have access to a new tool of geographical description that suitably supplies the demand, where needed.

Conclusions: The importance of SIGNe lies in the sharing and diffusion of information in a simple and web dynamical way. It allows different users, professionals, or decision makers, to visualise information according to their needs. Here we propose a first step that offers a representation of the supply and the demand of care for ESRD. We will further develop spatiotemporal approaches and different scenarios to help in healthcare decision making.

155 | AUTOMATIC RE-CODING OF VARIABLE VALUES FOR POOLED META-ANALYSIS OF EPIDEMIOLOGICAL DATA

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Introduction: Epidemiological studies often use multiple datasets from different periods (such as longitudinal studies). For pooled meta-analysis of these datasets, it is important to concatenate them. If variables have different specifications over periods, then this concatenation is difficult, therefore a method for automatic re-coding of variable values from different periods or studies to match a common specification is needed.

Method: The re-coding algorithm analyses the specification of each concatenated variable and harmonises them to a common specification. Furthermore, constraints such as missing value codes or values outside specification have to be considered. Afterwards, the harmonised variables will be used for further meta-analyses.

Results: Using this algorithm, we are able to perform a meta-analysis on four studies with 149 variables and over 2500 cases over 12 periods. Furthermore, the error prone process of manually re-coding is now supported by software, and is thus much more reliable.

Conclusions: The shown algorithm allows easier re-coding of variable specifications in complex data structures for pooled meta-analysis. The risk of errors in manually re-coding prior to statistical analysis can be significantly reduced.

156 | MIGRANT WOMEN, BILINGUAL HEALTH ADVOCACY, AND ANTENATAL HIV TESTING: A QUALITATIVE STUDY (FOR EUROPEAN PERINATAL EPIDEMIOLOGY NETWORK MEETING)

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Introduction: From April 2000, antenatal HIV testing has been recommended to all women in England at their first antenatal visit. This study was conducted in the aftermath of this policy change, in an area with a high proportion of migrant women, where local health services employ bilingual individuals trained to participate in healthcare encounters to facilitate understanding between clients and professionals.

Objective: To explore access to language services and their contribution to the provision of antenatal HIV testing.

Methods: Data collection was made through focus group interviews in hospital meeting rooms, maternity units, and community centres in east London. The participants were 26 childbearing women from four language groups, 20 providers of bilingual advocacy, and 19 midwives. Nvivo software was used in thematic analysis of verbatim and translated transcripts. The main outcome measures were participants' views and experiences of bilingual health advocacy in relation to the provision of information about antenatal HIV testing.

Results: Many women lacked language support at their first antenatal visit. When advocacy was available, constraints on time restricted discussion. Women did not express objections to HIV testing being part of their antenatal care. They recalled being told that the test was confidential and voluntary, but did not mention being told about maternal infection, prevention, or sexual health. Women complained about inadequate information about the reasons for investigations and that test results were not always explicitly reported to them. Advocates expressed a strong commitment to health promotion at individual and community level, but identified limitations of time and written resources as significant constraints to their efforts. They felt their role was not fully appreciated by other professionals and that this was an obstacle to women receiving the service. Midwives saw advocates as invaluable for providing care for non-English speaking women but expressed concerns about recognising and meeting women's need for language support. Partners' involvement at the antenatal consultation was viewed as sometimes problematic. Practitioners were wary of the possibility of partners blocking women's decision making. The ad hoc measures they used to protect women's autonomy may provoke client and partner resentment with unpredictable results.

Conclusions: Further development of information and communication strategies for migrant women is required. Women should be asked formally about their need for language support and their replies recorded. Local arrangements should be formalised and details disseminated to all staff. Gaps in language resources should be identified and addressed. Efforts are needed to raise professionals' awareness of the importance of language services and the contribution of bilingual advocates to maternity care. Multidisciplinary training initiatives may improve mutual understanding of roles and the quality of information for women. A separate meeting between a woman and bilingual advocate may relieve time pressures and enhance communication at the booking visit.

157 | MEDICAL USE PROFILE OF A BRAZILIAN RETIREE POPULATION IN RIO DE JANEIRO, BRAZIL

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Introduction: The Institute of National Social Security of Brazil (INSS) serves more than 10 million people aged 60 years and older. This population has certain peculiarities in its medicinal uses, and the Brazilian Confederation of Retirees and Pensioners asked the Ministry of Health to conduct a study that would improve national medical policies.

Objective: To describe the INSS beneficiaries' uses of medications. The study had three sample groups: a national sample, one in the municipality of Belo Horizonte, and one in the municipality of Rio de Janeiro. The results of the Rio de Janeiro study are discussed here.

Methods: In January and February of 2003, self administered questionnaires were sent to 800 randomly selected retired INSS beneficiaries who were residents of Rio de Janeiro. This same sample, plus 100 additional individuals, were also selected to be interviewed in their homes.

Results: There were 275 (34%) questionnaires received by mail, and 577 (76%) individuals in the sample were interviewed between March and August 2003. The groups that answered by post described health problems more frequently and had used more drugs in the previous 15 days than the respondents of the household survey. According to the household survey, 85% had used drugs in the last 15 days (versus 87% of those who responded by mail) and 39% used five or more products (versus 52% of those who responded by mail). Of the products used, physicians prescribed 94%, 78% were bought in pharmacies, 20% contained fixed dose combinations, and 4% were manufactured by government laboratories. According to respondents, the main reason for not using prescribed drugs was their high cost. The most consumed products were anti-hypertensives, anti-inflammatories, painkillers, and vitamins.

Conclusion: Most senior beneficiaries used medication for diseases associated with their age, and they generally consumed products with one active ingredient, prescribed by a physician. The government,

therefore, should offer better quality pharmaceutical support to allow the seniors to spend their limited financial resources to improve their quality of life. Despite the low response rate of the survey, the similarities between respondents and non-respondents suggests usefulness of the results of this postal, self administered, cross sectional survey.

158 GENOTYPING OF PATIENTS WITH SPORADIC AND RADIATION ASSOCIATED MENINGIOMAS

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Introduction: Ionising radiation is the most established risk factor for meningioma formation. In the 1950s, during the mass migration period to Israel, more than 20 000 children were treated with radiotherapy for tinea capitis, a fungal infection of the scalp. In addition, an unknown number of immigrants were irradiated abroad en route to their arrival in Israel. In 1968, our group initiated a comprehensive follow up of a cohort of approximately 11 000 irradiated individuals and two matched non-irradiated population and sibling control groups, to determine possible delayed radiation effects. A relative risk of 9.5 for meningioma development was found among the irradiated group, yet, only a small subset of the irradiated subjects (<1%) developed this neoplasm. Therefore, it seems plausible that genetic factors modify the risk for meningioma formation following the initiating effect of ionising radiation.

Objective: To evaluate the main effect of selected candidate genes on the development of meningioma and their possible interaction with ionising radiation in the causation of this tumour.

Methods: The total study population included 440 cases and controls: 150 meningioma patients who were irradiated for tinea capitis in childhood, 129 individuals who were similarly irradiated but did not develop meningioma, 69 meningioma patients with no previous history of irradiation, and 92 asymptomatic population controls. DNA from peripheral blood samples was genotyped for single nucleotide polymorphisms (SNPs) in 12 genes: *NF2, ERCC2, p16, Ki-Ras, E-cadherin, PTEN, cyclin D1, TGFβ1, TGFβR2, XRCC1, XRCC3, and XRCC5.* SNP analysis was performed using the MassArray system by Sequenom™, and computerised analysis by SpectroTyper. Logistic regressions were applied to evaluate main effect of each gene on meningioma formation and interaction between gene and irradiation.

Results: A *Ki-Ras* SNP was found to be associated with meningioma risk: the presence of the C allele significantly increased meningioma risk by about twofold compared with the TT homozygote state (OR 1.0, 1.96 and 1.74 for genotype TT, CT, and CC, respectively; overall p = 0.039). *Cyclin D1* and *p16* SNPs showed an inverse effect on the risk of developing meningioma when comparing irradiated and non-irradiated groups (p for interaction 0.02 and 0.036 respectively).

Conclusions: The *Ki-Ras* gene encodes a protein (p21ras) that plays a pivotal role in modulating cellular proliferation and differentiation. Our findings suggest that *Ki-Ras* SNP is a possible marker for meningioma formation. Both *cyclin D1* and *p16* genes have a role in the cell cycle control pathway regulating the transition through the G1 to S phase. Our results imply that these genes may modify the risk of developing meningioma following irradiation. Considering the numerous candidate genes that could be screened, these results need further validation in other studies.

159 VALIDATION OF SELF REPORTED DIAGNOSIS OF DIABETES MELLITUS TYPE 2 IN THE SPANISH SURVEY (DINO): OVERALL AGREEMENT AND PREDICTIVE VALUES

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Introduction: Diabetes mellitus Type 2 (DM2) is a prevalent disease that does not accord with a population registry suitable for epidemiological research. In follow up studies where DM2 incidence is an end point, identification of new cases often comes from a personal interview or questionnaire followed by a confirmation step using different clinical sources.

Objective: To assess the validity of a DM2 self report against the information provided by clinical history and measurement of blood glucose levels.

Methods: During 2002 the DINO Project (Prevalence of Diabetes, Nutrition and Obesity) was conducted in a random sample of people aged ≥20 years from Murcia, southeast Spain. Sample size was 2562 and response rate was 82% for questionnaire items and 61% for serum sample. All participants were asked ''Have you ever been told that you are diabetic?'', and based on the answer subjects were classified as having self reported diabetes or not. Medical records from a sub-sample of 255 subjects were checked out in order to confirm or reject a true diagnosis of diabetes. The criteria followed were: (*a*) diagnosis of diabetes included in the medical record, (*b*) treatment with hypogly-caemic medication (insulin or oral hypoglycaemic treatment), (*c*) one or more classical symptoms of diabetes plus a random blood glucose level of ≥200 mg/dl, (*d*) at least two elevated fasting blood glucose levels of ≥140 mg/dl, and (*e*) at least two elevated random blood glucose levels of ≥200 mg/dl or one after ≥2 h of an oral glucose tolerance test. Moreover, we compared self reported diabetes with fasting glucose levels considering as diabetic those people with values of ≥140 mg/dl. Sensitivity, specificity, positive and negative predictive values, and kappa score of self reported diabetes were calculated for all subjects taking into account blood samples and, for those in the subsample, also the information provided by medical records. We also tested associa-tions between these validity indicators and several demographic and lifestyle characteristics.

Results: When self reported diabetes results were compared with clinical information, sensitivity was 87.5%, specificity 100%, positive predictive value 100%, negative predictive value 98.7%, and kappa score 93%. When the self reports were compared with measured glucose levels, the values were 75%, 97%, 60%, 80.3%, and 64%, respectively. Sensitivity and kappa scores were lower among the overweight or obese subjects, those aged ≥55 years, women, non-smokers, subjects with a low educational level, and subjects who did not engage in physical activity during their leisure time.

Conclusions: In this population, self reported diabetes is an excellent indicator of clinical diabetes. However, validity will decrease drastically if the aim is to identify most of the prevalent cases of diabetes including those without a clinical diagnosis.

160 THE STUDY OF ASEPTIC MENINGITIS USING VIRUS DETECTION BY REAL TIME RT-PCR

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Objective: To study the aetiology of aseptic meningitis using real time reverse transcription polymerase chain reaction (RT-PCR) in cerebro-spinal fluid (CSF) for viral detection.

Methods: Aseptic meningitis was defined when CSF cytosis exceeded six leucocytes/ml and there was a negative culture. CSF samples were stored at −70°C until used. Primers and probes were manufac-tured by Epoch Biosciences (MGB Eclipse Probe system) and RT-PCR conditions adapted to the Rotor Gene real time cycler (Corbett Research).

Results: During a 2.5 year period, 224 consecutive CSF samples were studied. Ages of subjects varied from 2 months to 71 years. The range of CSF pleocytosis was 6−2100 cells/ml (>1000 in 8; 4%), glucose 15−141 mg/dl (<50 mg/dl in 35; 16%) and proteins 9−245 mg/dl (>100 mg/dl in 19; 8%). Cultures were negative in all samples. In 91 (41%) cases an agent was defined by PCR assay: enterovirus in 64 (29%), herpes simplex virus in 13, and Epstein-Barr virus in 3; based on clinical signs varicella zoster virus and mumps virus were the final aetiologies in 6 and 5 cases each; in 132 cases (59%) no agent was defined. All patients survived.

Conclusions: Viral CSF infections are more common in children and have a benign clinical course. PCR technique is very useful in the aetiological investigation, accounting in this study for 36% of the diagnosis. Other agents need to be considered in future studies to clarify the negative diagnosis cases (59%).

161 AIDS HOSPITAL INPATIENTS PROFILE IN BRAZIL

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Introduction: AIDS, one of the world's main problems of public health, is nowadays, in Brazil, an epidemic in expansion. However, the introduction of anti-retroviral therapy has managed not only to increase

the life expectancy of AIDS patients but also to reduce the long duration of hospital inpatient treatment

Objective: To describe AIDS hospital inpatients' profile during the year 2000 and to debate the possibilities of using this database in teaching activities related to the evaluation of endemic process control programmes.

Methods: This was a descriptive study using exploratory analysis of data for the country as a whole, macro regions, and federal units. Inpatients' data were obtained from the Hospital Information System (SIH-SUS/DATASUS/MS). The following variables were analysed: sex, age group, secondary diagnosis, procedure, juridical nature, length of stay, inpatient cost, and hospital mortality.

Results: In Brazil in 2000, 37 147 AIDS inpatients were registered, corresponding to 0.3% of the total of inpatients and 4.2% of the inpatients with infective parasitical disease; the hospital stay and hospital mortality rates were, respectively 21.9/100 000 inhabitants and 14.2/100 inpatients. Regarding the age groups, the hospitalisations were concentrated on individuals 20−29 years old (20.9%), 30−39 years old (40.1%) and 40−49 years old (20.8%), and were predominantly masculine (66.9%), with a sex ratio of 2:1. The AIDS inpatients' average cost was 25% above that observed for all other causes (R$512.27 versus R$409.38). It was not possible to analyse the secondary diagnosis variable, owing to lack of data (84%).

Conclusions: Even though the limitations of this system are recognised, the SIH-SUS appears to be an important source for hospital services evaluation, epidemiological studies, and health surveillance actions. In the specific case of AIDS, the potential of the database resides in the possibility of identifying sub-notified cases, followup of anti-retrovirus treatment impact, and monitoring of opportunistic diseases. The usage of this source for evaluation purposes transcends mere auditing and may be used for analysis implantation.

162 REASONS TO BE TESTED AND RISK PERCEPTION OF HIV POSITIVE MEN WHO HAVE SEX WITH WOMEN

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Objective: To describe risk perception before learning of HIV positive (HIV+) status, routes of HIV infection, and reasons for being tested of men who have sex with women.

Methods: This cross sectional study interviewed 250 HIV positive men recruited at two HIV/AIDS referral centres in São Paulo, Brazil: the Centro de Referência e Treinamento DST/AIDS–SP (n = 125) and Casa da AIDS (n = 125). All eligible participants answered a face to face questionnaire regarding demographic characteristics, sexual and drug use behaviour, condom use, routes of infection, and risk perception—that is, whether they believed they might be HIV positive when they underwent testing.

Results: The mean and median age of respondents was 39 years. Of the 250, 62% were heterosexuals and 38% bisexuals. They most often reported becoming infected through unprotected sex (32%), by having had many sexual partners (30%), injecting drug use (14.5%), sexual contact with prostitutes (12%), and through an HIV positive partner (7%). Becoming infected by sex only was reported by 18.5% and 2% reported to be infected through blood transfusion (multiple response was admitted). Only 45% believed themselves to be at risk for HIV at the time they underwent testing. They were usually tested because they became ill (42%). Only 8% were tested because they perceive themselves at risk and 13% underwent testing because their partner was HIV positive or became ill.

Conclusions: Findings showed that most HIV positive men who have sex with women, regardless of their risk situations, did not perceive themselves at risk before learning of their HIV positive status and only undergo testing due to their own or partner's illness. This fact has important implications for heterosexual transmission of HIV as transmission of HIV may be more likely to occur before learning of HIV infection status.

163 LOW BIRTH WEIGH AND SMALL FOR GESTATIONAL AGE AND DENTAL CARIES IN PRIMARY DENTITION IN A UNITED STATES POPULATION

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Introduction: Intrauterine growth restriction is one of the major public health problems both in developing and developed countries. In spite of biological plausibility, such as increased enamel defects among low birth weight (LBW) children there are inconsistent findings about the association between LBW and dental caries. This inconsistency has been attributed to methodological problems of the majority of the studies: few population based studies, poor control of confounders, and lack of adjustment of birth weight for gestational age and ethnicity.

Objective: To assess the association between LBW and low birth weight corrected for gestational age (small for gestational age; SGA) and dental caries in the primary dentition in the United States.

Methods: Cross sectional data from The Third National Health and Nutritional Examination Survey (1988–1994) were used in the analysis. White, African-American, and Mexican-American singleton children, 2−5 years old, with complete dental caries examination and who had an available birth certificate were studied (n = 3218). Small for gestational age was defined according to Zhang and Bowes (1994). Low birth weight children were those born <2500 g. Dental caries was assessed on the DF (decayed and filled surfaces) Index. Confounder factors considered were: poverty level, race/ethnicity, carbohydrate consumption, dental visit, secondary smoking, mother's education, and breastfeeding. Stratified analysis was followed by multivariate modelling separately for LBW and SGA using GEE Poisson regression. The Suddan statistical package was used for correcting for complex sampling design.

Results: Dental caries (at least one surface) was found in 21.1% of the children with a mean (SE) of 2.7 (0.2) surfaces with dental caries per individual. The prevalence of LBW was 10.1% and the prevalence of SGA was 5.9%. Although not significant, in the bivariate analysis, mean (SE) DF was lower (p = 0.4550) for SGA (1.5 (0.3)) than for those normal for gestational age (1.8 (0.2)), and higher (p = 0.3349) for LBW (2.7 (1.0)) than for normal weight children (1.7 (0.2)). After adjusting for possible confounders, we were not able to find an association between SGA (0.70; 95% CI 0.44 to 1.13) or LBW (1.07; 95% CI 0.50 to 2.30) with dental caries. No interaction could be detected either.

Conclusion: This study does not support the association between low birth weight or small for gestational age and dental caries in the primary teeth in an American population. If the hypothesis of increased risk for dental caries between LBW and SGA is true, it is possible that in this population, general preventive measures such as fluoride exposure are modifying this association.

164 EFFECT OF EARLY WORKING ON BODY MASS INDEX OF YOUNG ADULTS: A COHORT STUDY

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Introduction: Working has been reported to have detrimental effects on children's growth. A negative association has been described between childhood work and weight. However, most of the studies come from underprivileged populations therefore lacking evidence from wealthy communities.

Objective: To assess the effect of childhood work (less than 14 years old) on body mass index (BMI) of a 23–24 year old males and females from a population based cohort born in 1978/1979 in Ribeirão Preto, the wealthiest area in a developing country, Brazil.

Methods: From 6728 valid questionnaires obtained from mothers of the initial cohort when they gave birth to a live singleton, 1071 (15%) individuals (518 males and 553 females) were re-examined at 23–24 years old. Childhood work was classified into three categories according to the age at the first job: <14, 14–16 and ≥17 years old. Those who identified themselves as having Oriental descent were excluded from the study. Socioeconomic status was measured by education, current work, ethnicity, family income at birth, number of siblings, secondary exposure to tobacco at home, and mother's age and education. Known determinants of weight were also considered: order of birth, birth weight, birth length and smoking status. The analysis was performed separately for males and females. Covariance analysis followed bivariate and stratified analysis. Variables were selected into the model using a backward stepwise selection of the variables.

Results: BMI average (SE) was 25.1 (0.2) kg/m^2 for males and 23.6 (0.2) kg/m^2 for females. The crude association between working and BMI was positively and statistically significant for both males (p = 0.019) and females (p = 0.007). The crude BMI average for the three categories of working status (<14, 14–16 and ≥17 years old) was 25.9, 25.1,

and 24.4 kg/m^2 for males and 25.9, 25.1, and 24.4 kg/m^2 for females. After adjusting for covariates BMI was still associated with working status for males (26.1, 25.4, and 24.4 kg/m^2; p=0.027) and for females (24.7, 22.6 and 22.9 kg/m^2; p=0.002). The other important predictors in the final model for males were: current work (p=0.009), education (p=0.014), and mother's education (p=0.071). For females, besides work status the other important variables were mother's education (p=0.054), mother's age (p=0.089), birth weight (p=0.065), and family smoking (p=0.007).

Conclusions: In contrast to the literature our results showed that even after adjusting for socioeconomic variables, working was strongly positively associated with BMI. It is possible that these results reflect different types of work, with children in Ribeirão Preto usually being enrolled in less physical activity, which would have an effect in promoting higher levels of fat deposit measured by the BMI.

165 PREVALENCE AND RISK FACTORS OF COMMON NAEVI IN THE GENERAL POPULATION: RESULTS OF THE KORA SURVEY 2000

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Introduction: Malignant melanoma (MM) is currently the fastest increasing malignancy and constitutes a major public health burden. The number of common naevi (CN) is known to be related to the MM risk and may serve as a marker in epidemiological studies. Little, however, is known from population based studies about the frequency and determinants of CN in adults.

Methods: For the KORA (Cooperative Health Research in the region of Augsburg, Germany) Survey 2000, a random sample stratified by age and gender of the adult (25–74 years) population of the city of Augsburg was drawn. Participants received a full dermatological examination whereby the number of CN was assessed in four categories (0–10, 11–50, 51–100, and >100). Presence of frequent CN was defined for persons with more than 50 moles. Basic demographic factors and potential specific risk factors were assessed by a standardised computer assisted interview.

Results: A total of 2822 (response 67%) subjects participated. In accordance with the study design, the sample comprised an equal number (1411) of men and women and the mean age was 48.8 years. The prevalence of CN according to the four categories was 31.6%, 60.3%, 6.6% and 1.5% respectively. A total of 229 subjects exhibited frequent CN. According to bivariate analyses these subjects differed significantly from their counterparts with fewer naevi with respect to the following parameters: age (40.6 versus 49.5 years), female gender (32.3% versus 51.6%), height (173.0 versus 168.2 cm), smoking (35.8% versus 27.4%), family member with >50 moles (34.8% versus 10.7%), skin tumour in the family (7.4% versus 2.5%), history of sunburn (87.6% versus 66.7%), and use of sunblock (83.4% versus 73.4%). Multivariate analysis revealed (after control for socioeconomic status (school education) and use of sunbeds and sunblocks) significant influence on frequent CN of female gender (OR 0.49, 0.30 to 0.80), age (OR 0.82, 0.76 to 0.88), height (>174.9 versus <161.3 cm OR 2.21, 1.05 to 4.68), family member with >50 moles (OR 3.76, 2.62 to 5.39), skin tumour in the family (OR 2.56, 1.27 to 5.14), and history of sunburn (OR 1.85, 1.17 to 2.94).

Conclusions: CN are frequent in the adult general population and their number depends on demographic, body metric, and genetic factors as well as parameters of an individual UV exposure.

166 OVERVIEW OF RESULTS FROM THE GLOBAL BURDEN OF DISEASE STUDY IN BRAZIL, 1998

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Introduction: We applied methods developed for the Global Burden of Disease (GBD) study in order to estimate the burden of incident disease in Brazil in 1998. The method proposes a summary measure, disability adjusted life years (DALY), which corresponds to healthy years lost, and is calculated by summing years of life lost due to premature mortality (YLL) and number of healthy years lost due to disabilities (YLD). It allows

for the identification of the most influential diseases in the country in terms of mortality and incapacity generated. The results presented are the first related to a high impact country in Latin America.

Objective: To estimate the burden of incident disease in Brazil in 1998, considering large groups of causes, sex, age, and country macroregions.

Methods: We employed a correction factor to account for under-registration in the Brazilian Mortality Information System. We also identified national datasets and performed national and international literature review to obtain estimates of prevalence, incidence, duration, and disabilities related to diseases, and applied the GBD methods. Estimates were obtained for each region of the country and stratified by sex, cause, and age group.

Results: For Brazil as a whole, we computed a total of 42 182 066 (261/100 000 inhabitants) DALYs, being 18 031 271 (111/100 000 inhabitants) due to mortality (YLL), and 24 150 795 (149/100 000 inhabitants) due to disabilities generated (YLD). DALY were distributed throughout the large disease groups as follows: 18 854 948 for Group I (communicable, maternal, perinatal, and nutritional conditions); 47 533 417 for Group II (non-communicable diseases); and 17 975 766 for Group III (injuries). The three main causes generating DALY (unintentional injuries, neuropsychiatric conditions, and cardio-vascular diseases), YLD (neuropsychiatric conditions, unintentional injuries, and cardiovascular diseases), and YLLs (cardiovascular diseases, cancers, and perinatal conditions), reflect the epidemiological transition standard of the country. In addition, results of the study allow identification of problems traditionally not considered in the public health field.

Conclusion: The Brazilian Burden of Disease Study has provided important results to support health policy formulation in the country.

167 FAMILY FOOD INSECURITY: SCALE VALIDATION IN BRAZIL

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Introduction: A basic civil right is access to food. Food security is the guaranteed and permanent access to enough food of good quality, obtained through socially acceptable ways. Because the Brazilian Hunger Eradication Programme did not have a direct instrument to monitor intervention the researchers proposed the validation of the food insecurity (FI) module of the USDA.

Methods: After translation to Portuguese content, and carrying out of face validity in urban and rural populations in five different states, the selection of the five municipal districts was based on the need to represent several socioeconomic and cultural realities. Content validity was developed with a panel of experts from different professions, gathered to review the translation, analyse strategies of inquiry, and propose social, demographic, and food intake variables. There were four panels for urban validation and one for rural. Using four focus groups with community members from urban areas and seven with traditional family farmers and agricultural workers, a 15 item questionnaire was approved and the rural members proposed some idiomatic adaptation and the inclusion of ''agricultural production'' in some questions. A quantitative validation was carried out with an intentional sample of 711 urban households from various income strata: middle, low middle, poor, and very poor. The rural sample was formed by 1080 families of rural permanent workers, temporary rural workers, and traditional farmers, farmers of settlements of the agrarian reform, riverside farmers, and farmers from the remainds of ''quilombos'' (slave descendants). The questionnaire included income and daily food intake variables and in the rural area, it also included variables of rural production and proportion of production for the family needs.

Results: Internal validity in urban and rural populations was high, Cronbach's alpha ranged from 0.87 to 0.95. External validity was also high; the scale item response curves were parallel across the four income strata. FI severity level was associated in a dose−response manner with income strata and the probability of daily intake of foods such as meat, dairy products, fruits (except in the Amazon state) and vegetables. A higher proportion of FI was observed in the urban population (ranging between 90% in Goias to 81% in São Paulo), while rural FI was 51% in São Paulo. Severe FI in urban areas ranged between 45% in Amazon and 13% in São Paulo, and in rural areas between 35% in Amazon and 11% in Paraiba.

Conclusion: The contribution of this study is a validated instrument for surveillance of the impact of the Brazilian social policies that aim to control hunger and misery.

168 SEXUAL ABUSE AMONG MEN LIVING WITH HIV/AIDS IN SÃO PAULO, BRAZIL

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Introduction: Sexual abuse as an expression of violence is associated with severe psychosocial impact and its recognition should thus be part of a comprehensive care of people living with HIV/AIDS.

Objective: To investigated history of sexual abuse, reported by men living with HIV/AIDS, who have sex with women, under follow up at reference centres in São Paulo city.

Methods: From Oct/2001 to Feb/2002, a consecutive sample of 242 men, who reported having sex with women, was interviewed at the STD/AIDS Reference and Training Centre of the São Paulo State STD/AIDS Programme and the University of São Paulo Medical School AIDS Clinic. By means of a standardised questionnaire, patients were asked about history of sexual abuse. For cases with a positive answer, patient's ages at the time of abuse and data concerning the aggressor were collected. Moreover, patients were questioned whether they had ever sexually abused of anyone and if so, under what circumstances.

Results: Studied patients were mostly white men (58%), with a mean age of 39 years old and schooling of 9 years. Mean time since HIV diagnosis was 60 months. History of sexual abuse, before and after the age of 15 years was reported by 42 (17.3%) and 27 (11.2%) men, respectively. Among men abused under the age of 15 years, 64.3% reported events that occurred before the age of 10 years and aggressors included relatives, friends, and teachers. Only three patients were abused by women. In regard to victims of abuse after 15 years old, 57.7% reported events between ages of 15 and 17 years, whereas 30.8% were abused at the ages of 18−20 years; 10 patients (38.5%) knew their aggressors. When questioned whether they had themselves sexually abused of anyone, 14 (5.8%) confirmed such an occurrence and 10 (71.4%) reported knowing their victims. Sexual abuse of others was significantly associated with having suffered sexual abuse after the age of 15 years (χ^2, p<0.001).

Conclusions: History of sexual abuse is frequent among men living with HIV/AIDS, who have sex with women, from the participating reference centres. The investigation of abuse as part of a comprehensive care approach of these individuals may be useful for the proposal of psychosocial interventions. The association between history of having been abused and reports of abusive behaviour deserves further investigation.

169 THE RELATIVE IMPACT OF RISK FACTORS FOR COLORECTAL CANCER IN A NORTHERN EUROPEAN POPULATION: RESULTS FROM A CASE–CONTROL STUDY IN SCOTLAND

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Introduction: The incidence of colorectal cancer in Britain falls in the upper third of rates observed worldwide. Within Britain, incidence in Scotland exceeds that in England and Wales. Rates have been rising in Scotland as in other parts of Europe. These trends highlight the importance of developing prevention strategies. Primary prevention is theoretically possible, as several identified risk factors relate to potentially modifiable lifestyle behaviours. The impact of lifestyle risk factors in colorectal cancer has been assessed in southern and middle European populations, but not in northern Europe.

Objective: To determine whether there are differences in the relative impact of such factors across Europe, we analysed data from a population based case–control study in Scotland.

Methods: Eligible cases were resident in Grampian, northeast Scotland, and diagnosed with histologically confirmed primary cancer of the colon or rectum during September 1998-February 2000. They were ascertained from the Grampian centralised pathology service. Controls were selected from the Community Health Index, an inventory of everyone registered with a general practitioner in Grampian. Subjects completed a pre-validated 150 item semi-quantitative food frequency questionnaire and a lifestyle questionnaire. Dietary variables were energy adjusted using the nutrient residual approach. Adjusted odds ratios (OR), population attributable risks (PAR), and 95% confidence intervals were calculated using Stata software.

Results: There were 264 cases (62% of those eligible) and 408 controls (61%) who participated in the study. Risk was raised twofold in those reporting a positive first degree family history of colorectal cancer. Social class did not affect risk. In a model adjusted for age, sex, and

family history, non-use of aspirin compared with regular use significantly increased risk (OR 1.68, 95% CI 1.10 to 2.58). This association was stronger for colon than rectal cancer. Non-use of other non-steroidal anti-inflammatory drugs (NSAIDs) also raised colorectal cancer risk. HRT use in women significantly reduced risk of colon, but not rectal, cancer. Smoking was not associated with risk. Higher intake of alcohol increased risk of rectal cancer only (OR 1.92, 1.04 to 3.55). Obesity and low levels of physical activity modestly, but not significantly, increased colon cancer risk. Red meat intake did not affect risk. The upper quartile of vegetable intake had slightly, but not significantly, reduced risk. The colorectal cancer PARs for regular use of aspirin and other NSAIDs were 32% (6.8 to 50.3) and 33% (2.5 to 53.8) respectively.

Conclusions: Few of the established lifestyle risk factors for colorectal cancer were significantly associated with disease risk in our northern European population. Odds ratios for obesity and low physical activity were of a similar magnitude to other studies. Diet affects risk little, perhaps due to a relative lack of variation in intake across the Scottish population. While the PARs for aspirin and other NSAID use are high, the risk−benefit ratio of using these as part of a colorectal cancer prevention strategy is unclear.

170 INCIDENCE OF STROKE IN URBAN AND RURAL POPULATIONS: A META-ANALYSIS OF OBSERVATIONAL STUDIES

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Introduction: The comparison of stroke rates in different countries and environments may improve the knowledge about aetiology and disease prevention.

Objective: To compare the incidence of stroke in community-based studies from around the world, and attempt to evaluate the urban-rural dichotomy as a possible source of heterogeneity for incidence of a first in a lifetime stroke.

Methods: We reviewed studies identified through a Medline literature search between 1980 and 2003 and those cited in the references of published reports. Standard criteria for inclusion were the World Health Organization definition of stroke, the presence of a first in a lifetime stroke, and an adequate community based case ascertainment. A total of 26 studies were included, one of them conducted recently in Northern Portugal. They included a population of 4 157 520 and 6 475 199 person years. Hospital based incidence studies and studies reporting incidence of total strokes were excluded. A meta-analysis of the pooled incidence rate for sub-groups of studies according to age restriction and of the pooled age specific incidence rates was performed.

Results: The overall annual incidence of a first stroke was 2.14 per 1000 (95% CI 2.10 to 2.17) in the 26 studies selected. In the 20 studies with no age restriction (excluding five studies with a lower bound limit (15, 18 and 25 years) and one restricted to the 45−84 years age range), the incidence became 2.08/1000 (95% CI 2.04 to 2.12). In the 10 studies performed in city populations (2 450 803 person years) the annual incidence of a first stroke was 2.07/1000 (95% CI 2.01 to 2.12) and in 11 studies in mixed urban/rural populations (2 312 550 person years) was 2.09/1000 (95% CI 2.03 to 2.15). The presence of heterogeneity within these population subgroups as indicated by the Cochran test (Q 442, df 9, p<0.001 and Q 385, df 10, p<0.001, respectively) was high. Age specific incidence rates increased exponentially from 0.12/1000 (95% CI 0.11 to 0.13) for those aged 0−44 years to 22.4/1000 (95% CI 21.4 to 23.5) for those 85 years and older. Analyses of age specific standardised residuals indicated strong positive deviations from the overall exponential pattern in Eastern European countries and Japan and negative deviations in urban areas of Western European countries.

Conclusions: Meta-analyses showed an increased risk of a first ever stroke in mixed urban/rural environments, Eastern European countries, and Japan, suggesting that in addition to environmental factors, others such as genetic factors, may underlie this macro perspective. More specific analyses of pathological types of stroke and case fatality may clarify these findings.

171 THE IMPACT OF THE FAMILY HEALTH PROGRAMME IN THE MUNICIPALITY OF SOBRAL, BRAZIL: AN ANALYSIS ON THE EVALUATION OF CHILDREN'S HEALTH UNDER 5 YEARS OF AGE, 1995−2002

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Introduction: In the last few years, the health system framework within Brazil has gone through a great number of changes. In 1994, the

Ministry of Health launched the Family Health Programme, with the purpose of redirecting their focus on re-structuring primary healthcare. Part of the restructuring was directed towards family care as well as the family environment. In the city of Sobral, the Family Health Programme started in 1997, with an emphasis on mother and child healthcare through the reorganisation of pre-natal assistance, delivery, and birth, and health surveillance in the first year after birth.

Objective: To collect and analyse information on certain key health indicators of children under 5 years of age who had been born in and were residents of the Sobral municipality.

Methods: A sequential series of studies on the health indicators was performed in children under 5 years of age, based on the official information systems, between 1995 and 2002. In order to evaluate the evolution of the health indicators, a linear correlation analysis was undertaken; Student's *t* test was applied to reduce the statistical variations to 5% (p = 0.05).

Results: The child mortality rate reduction was significant (p = 0.001), from 71.66 to 21.45/1000 live births, with a neonatal (0 to 27 days) and post-natal (1 to 12 months) mortality reduction (p = 0.026 and p = 0.022, respectively). Child deaths at home were reduced from 6.36% to 4.3%. The percentage of pregnant women with pre-natal care increased from 76.01% to 95.14%. The percentage of children being breastfed only up to the fourth month of age rose from 50.00% to 96.50%. The number of children receiving immunisation grew from 68% to 96.50%. The percentage of children admitted to hospitals for malnutrition was reduced from 8.6% to 1.40%. Since 2000, there are no records of hospital deaths due to malnutrition. In addition, since 2001, no deaths were recorded for acute respiratory disease.

Conclusion: The findings of this current study show that the personalised and integrated job undertaken by the Family Health Programme has greatly helped to foster better health and assist in the prevention of diseases in young children. Owing to the programme, a significant reduction in the number of deaths in children under 1 year old and positive changes in selected indicators have been realised.

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172 ASSESSING WOMEN'S VIEWS OF MATERNITY CARE 1989–2000: THE VOICES OF IMMIGRANT AUSTRALIAN WOMEN OF NON-ENGLISH SPEAKING BACKGROUNDS

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Introduction: In the year 2000, over 40 000 women who were born overseas in countries where English is not the principal language spoken gave birth in Australia, comprising some 16% of all women giving birth in Australia in that year.

Objective: To review the maternity care experiences of immigrant Australian women of non-English speaking backgrounds (NESB) in the period 1989–2000 and to determine if immigrant women's experiences of maternity care have improved over time.

Methods: This paper is a review of the findings of: three statewide postal surveys of women giving birth in Victoria, Australia (Survey of Recent Mothers (SRM) 1989, 1994, and 2000); one cross cultural interview study of Vietnamese, Turkish, and Filipino women (Mothers in a New Country Study (MINC) 1994–7); and one hospital network based postal survey (Evaluation of Practice and Organisation of Care at Southern Health (EPOCS), baseline survey 1999).

Results: The 1989 SRM found that immigrant women of NESB were more likely to be dissatisfied with their antenatal care, less likely to experience low rates of intervention in birth, and more likely to have difficulties getting the information and support they wanted in hospital after the birth, compared with women of English speaking backgrounds (ESB). In each of the four studies conducted since SRM 1989, standardisation of the questions has meant that direct comparisons can be made across the studies regarding women's global ratings of care. The findings of these comparisons are sobering. In the entire studies immigrant women of NESB gave significantly poorer ratings of their maternity care compared with women of English speaking backgrounds. In the MINC study, the only study to involve immigrant women not fluent in English, 18% of women rated their antenatal care as 'very good', compared with 65–66% women of English speaking backgrounds in the other studies. Thirty-six percent of women in MINC rated their intrapartum care as 'very good' compared with 70–73% of women of ESB, and only 26% rated their postpartum care as 'very good', compared with 52–54% of women of ESB in the other studies. Nor is there any evidence across the studies that immigrant women's poorer ratings of their maternity care improved over the period 1989–2000. Reasons for these poorer ratings most commonly related to care that was perceived to be rushed, disrespectful, unkind, and lacking in explanation.

Conclusion: Efforts to address immigrant women's poorer ratings of maternity care are long overdue. Strategies for improving the care provided to immigrant women will be discussed.

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173 ASSESSMENT OF NUTRITION AMONG WOMEN BEFORE PREGNANCY: KRAKOW STUDY

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Introduction: The present study is a part of ongoing cohort study on impact of environmental factors during pregnancy on pregnancy outcome and child development.

Objective: To assess nutrition of women before pregnancy.

Methods: Our sample consisted of 528 non-smoking pregnant women who were consecutively recruited between November 2000 and November 2003. During the second trimester of pregnancy, a Food Frequency Questionnaire (FFQ) was administered to assess the average intake of 148 food products during 1 year prior to pregnancy. Intakes of energy, macronutrients, and micronutrients were assessed by computer program. These intakes were compared with the reference level of intake given by the Polish National Food and Nutrition Institute with respect to age, body mass, and level of physical activity. Nutrient density (amount of given nutrient/1000 kcal of energy intake) was calculated to assess qualitative value of nutrition.

Results: We observed a high percentage of women who had a high intake (>110% of required amount) of protein and vitamins A, C, and PP (over 90% of our sample) and a high intake of fats and cholesterol (over 50% of women). We found deficiencies in vitamin B1 intake: 71.4% of subjects did not meet the recommended intake for thiamine (range of observed intake: 0.4−4.3 mg/day). Intake of mineral components was also low (except sodium). In particular, intake of iron was very low; 75.4% women had intake of iron below 90% of the ''safe" level of iron intake. Analysis of energy standardised intake of micronutrients showed that younger women (<25 years old) consumed less protein and less fat in their diet (mean (SD) 34.8 (4.07) g/1000 kcal of protein and 37.3 (4.90) g/1000 kcal of fat) than older women (protein intake 37.1 (4.40) g/1000 kcal; fat intake 39.0 (4.78) g/1000 kcal). Observed intake of vitamins and mineral components was lower in the group of younger women; mean intake of iron in women <25 years old was 6.23 (8.66) mg/1000 kcal in comparison to 6.51 (0.905) mg/1000 kcal in the oldest group (>30 years old). We also found statistically important differences in nutrients intake between educational level subgroups. Women with educational level no higher than vocational had lower intake of protein, vitamins, and minerals than those who graduated from secondary school or had a university degree.

Conclusions: Observed intake of mineral components before pregnancy was very low in this cohort of Polish women, and may influence fetal and child development. In particular, young, poorly educated women were found to have improper nutritional habits before their pregnancy.

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174 MORTALITY FROM EXTERNAL CAUSES IN LITHUANIA: THE EFFECT OF EDUCATIONAL LEVEL

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Introduction: Inequalities in health are of particular importance in Lithuania, a country that is undergoing social, economic, and political transition. Educational attainment is closely associated with occupation, income, health behaviour, and many other characteristics related to the health of the population.

Objective: To analyse the risk profile of the Lithuanian population for major external causes of death in relation to educational level.

Methods: Information on deaths was derived from the computerised database of the Lithuanian Department of Statistics for the years 1989 and 2001. Data on the level of education were obtained from the censuses of 1989 and 2001, linking them with the death records. The population over 25 years of age was included in the analysis. Calculations were compiled for the following causes of death: external causes (International Classification of Diseases (ICD)-9 codes E800–E999), traffic accidents (IE800–E848), suicides (E950–E959), and homicides (E960–E978). Mortality rates were calculated per 100 000 population, and age standardised using the European standard population. Mortality rate ratios (RR) and their 95% confidence intervals (CI) between those with primary or lower education versus university education were calculated.

Results: Mortality from external causes differed considerably by educational level. Males with university education had significantly lower

mortality from external causes than those with other levels of education, and especially those with primary education alone (RR 4.35; 95% CI 3.11 to 5.60) in 1989. Mortality among females did not differ significantly by level of education in 1989. Mortality of males from external causes significantly increased in all educational groups from 1989 to 2001, although the most noticeable increase was estimated in the group with primary education only (1.76 times). There were no significant changes in mortality of females with university and secondary education during the study period, while mortality in the lowest educational group increased by 3.68 times. In 2001, mortality of males and females with primary education was significantly higher than that of the population with university education (4.61 and 6.65 times respectively). A similar pattern was noted while analysing mortality from the major external causes (traffic accidents, suicides, and homicides) by educational level. The greatest differences were observed in mortality from suicides among males; in the group of males with primary education only, mortality was 10.53 times higher than that of males with a university education in 1989, and 7.76 times higher in 2001.

Conclusions: The study disclosed considerable inequalities in mortality from external causes by the level of education. Mortality differentials increased during the decade, especially in females. Implementation of a balanced national health policy, paying particular attention to the lowest educational groups by the developing of a supportive social environment and equal opportunities for education, is the solution.

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175 | **LIFETIME OCCUPATIONAL AND RECREATIONAL PHYSICAL ACTIVITY AND RISKS OF COLON AND RECTAL CANCER: A CASE–CONTROL STUDY IN POLAND**

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Introduction: In 2002, the International Agency for Research on Cancer summarised that there is sufficient evidence in humans for a cancer preventive effect of physical activity for colon cancer. Studies on rectal cancer yielded less consistent results. Nevertheless, important aspects of the associations between physical activity and colon and rectal cancer risks are still under discussion, especially the impact of physical activity at different ages and possible confounding and effect modifications by other lifestyle factors, especially diet.

Methods: In 2000–2003, 239 incident cases of colorectal cancer (98 with colon and 141 with rectal cancer), confirmed by histopathology, and 239 controls, matched by age and gender, were enrolled. Controls were chosen from among patients with no history of cancer from the same hospital and admitted for treatment for non-neoplastic conditions unrelated to digestive tract diseases. Data on different types of physical activity (occupational activity, sports, household tasks, gardening, walking, and cycling) were collected in standardised interviews for the ages 20, 30, 40, 50, and 60 years. Besides lifestyle and socio-demographic characteristics, such as education and lifetime smoking, the usual dietary pattern for 148 beverage and food items was assessed within a food frequency questionnaire.

Results: In multivariate logistic regression for colon cancer, significant risk reductions for the highest quartile of total physical activity were found for almost all life periods. For lifetime mean physical activity, multivariate odds ratio for the highest quartile was 0.37 (95% confidence interval (CI) 0.17 to 0.83). For lifelong constantly high exercisers compared with lifelong non-exercisers odds ratio was 0.26 (95% CI 0.08 to 0.84). Total energy intake modified the effect of physical activity where the protective effect for colon cancer was more pronounced in persons with a high energy intake. Looking at the different components of total physical activity, high levels of occupational physical activity but not of leisure time physical activity yielded significant risk reductions. We did not observe notable confounding or effect modification for other lifestyle factors. For rectal cancer, we did not find a consistent association with physical activity.

Conclusions: These data support an inverse association of physical activity and colon cancer risk, but not for rectal cancer risks. We could not identify a specific age at which high levels of physical activity are most effective against colon cancer. The protective effect of physical activity was dominated by occupational activity rather than from leisure time exercise.

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176 | **RESPIRATORY HEALTH OF CHILDREN AND HOME ENVIRONMENT**

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Introduction: Respiratory diseases are common in childhood and probably can be caused by environmental factors.

Objective: To assess the importance of home environment to respiratory health of children.

Methods: A cross sectional survey was conducted on 594 children (356 boys and 238 girls) aged 6–7 years from 20 kindergartens located in a city. A questionnaire of International Study of Asthma and Allergy in Childhood (ISAAC) filled out by parents was used. Information was obtained on respiratory symptoms and diseases, and on certain aspects of the home environment such as environmental tobacco smoke (ETS), gas cooking, and pets in the child's home. The parameters of respiratory function (FVC, FEV_1, FEV_1/FVC, FEF25–75, PEF) were measured with Pony Graphics 3.5 software. Response rate was 58.6% to 69.2% depending on kindergarten.

Results: More than two fifths of the children were exposed to ETS, 65.3% of subjects experienced gas cooking, and 15.5% had pets at home. A cough that had lasted for at least 4 weeks during the past year was experienced by 24.5% and 16.9% of children with and without exposure to ETS ($p < 0.05$). Wheeze in the past was found in 43% and 27% of children ($p < 0.05$), and wheeze during the past year was more prevalent in girls exposed to ETS (18.8% versus 7.6%, $p < 0.05$). There was a significant difference in prevalence of sneezing or a runny/blocked nose when a child had not had a cold between children with and without exposure to ETS (46.6% and 36.6%, $p < 0.05$). We did not find differences in prevalence of respiratory symptoms and diseases between children with and without exposure to gas cooking or in children that did or did not have pets at home. FEF25–75 and PEF of girls exposed to ETS were significantly lower than that of girls not exposed. The same indices of children with exposure to gas cooking were significantly lower than that of without exposure (2.46, 2.06, 1.33, and 2.57 versus 2.62, 2.20, 1.46, and 2.74 litres, respectively, $p < 0.05$). Multiple regression analysis that included variables such as ETS, family history of allergy, maternal smoking during pregnancy, gas stove, pets in child's home showed that in girls FEF25–50 were related to ETS; in boys FEF25 and PEF were related to mother's smoking during pregnancy, and in both girls and boys FEF25–75 and PEF were related to gas used for cooking.

Conclusion: The data obtained show that some respiratory symptoms of children are related to ETS. Both ETS and gas cooking decrease small airways parameters.

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177 | **SCHOOL FAILURE AND LIFE CONDITIONS IN CHILDREN AGED 7–10 YEARS OLD, SOBRAL, CEARÁ, BRAZIL**

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Introduction: School failure at early stages of school life is very common in Brazil, and one of the causes commonly attributed to such failure is children's health condition. There are few population based epidemiological studies on this issue, which could allow a better understanding of how socioeconomic, cultural, and educational dimensions interact, through health and life conditions of the families and children, towards early school success or failure.

Objective: To study the association with school performance of health and life conditions of children aged 7−10 years, in the urban area of Sobral, a medium sized town in the State of Ceará, northeast Brazil.

Methods: This was a cross sectional, population based epidemiological study, with in house interviews and anthropometrical assessments. Children aged 7−10 years on the day of the interview composed the sample. The associations between school performance and demographic, socioeconomic, health, and life conditions were studied using univariate and multivariate analyses.

Results: There were 2253 children included, of whom 1692 (75.1%) were attending state schools. Almost 50% of mothers had less than 4 years of education. Children were classified into three categories of school performance: group A (children at school who had never had any failure; n = 1684; 74.4%), group B (children at school who had already had a failure; n = 465; 20.5%), and group C (children who were not attending school; n = 104; 4.6%). Group C was markedly different from groups A and B regarding life conditions, invariably having much worse results than the two other groups. In order to identify variables associated with school failure, groups A and B were compared. In the multivariate analysis, school failure was independently associated with the following variables: income per capita, mother's education, receiving help with homework, being registered in a family health programme, and a religious belief other than Catholic. Concerning health related variables, only previous history of malnutrition and

hospitalisation were statistically significantly associated with school failure in the univariate analysis, but such associations did not remain in the multivariate analysis.

Conclusions: The study allowed a better understanding of some factors associated with school failure, with the inclusion of important dimensions of its complex framework of causality, underlining the relevance of socioeconomic conditions, which are expressed through other variables, according to specific circumstances. Such findings support the need of studies focused on specific contexts.

178 CORONARY RISK FACTORS AND BIRTH WEIGHT OF COHORT OF YOUNG ADULTS BORN IN WARSAW: PRELIMINARY DATA

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Objective: To investigate the relationship between coronary risk factors and birth weight in young adults aged 24–28 years.

Methods: The study comprised 1900 young adults born as singletons in one district of Warsaw in 1974–77, whose mothers participated in the prospective follow up at the National Research Institute of Mother and Child from the first visit during pregnancy till delivery. To date, 439 (23.1%) have undergone examination. HDL cholesterol, triglycerides, glucose, insulin, fibrinogen, and glycosylated haemoglobin were determined in fasting venous blood. LDL cholesterol was calculated by Friedewald's formula. Body mass index (BMI) and blood pressure were measured by conventional methods.

Results: The correlations of the investigated parameters with birth weight do not form any particular pattern in the whole group, among males and females separately, or among persons born at term. HDL cholesterol alone was significantly correlated with birth weight (males: $r = 0.145$, $p = 0.044$, females: $r = -0.177$, $p = 0,005$). However, HDL and LDL cholesterol, triglycerides, glucose, insulin, fibrinogen, glycosylated haemoglobin, and blood pressure were significantly associated with actual BMI. Birth weight also correlated with BMI. Controlling for BMI by means of partial correlations of the relationship of the investigated parameters with birth weight revealed a negative relationship of insulin level (both sexes) with birth weight, and a still positive relationship of HDL cholesterol in men and negative in women.

Conclusions: The relationship between coronary risk factors and birth weight in young adults needs further investigation, although in the Polish population, the actual health status of young adults seems to be more important than their birth weight.

179 BASIC PERINATAL INDICATORS IN POLAND

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Introduction: Recent publication of PERISTAT report gives the opportunity of comparison of basic Polish perinatal indicators with European data.

Methods: The data from Polish birth and infant death certificates for the year 2000, collected by the Central Statistical Office, are presented and compared, when possible with published PERISTAT data.

Results: In Poland, as well as in other countries of Central and Eastern Europe, dramatic changes in reproductive behaviours of families accompanied the political and economic transition. Fertility rate decreased from >2 children/woman of childbearing age to 1.2. The changes in reproductive behaviours influenced the demographic and social structure of childbearing women. However, the pattern of deliveries in Poland does not differ greatly from other countries in Western Europe. Proportion of live and stillbirths by women <20 years of age was 7.3% in 2000 (in countries participating in PERISTAT project, values vary from 1.6% to 7.7%), proportion of live and stillbirths by women more than 34 years was 9.3% (in Western countries, varies from 10.9% to 20.8%). The percentage of first births was 47.8% (from 39.7% to 55% in Western Europe), and the percentage of fourth and later births was 4.6% (from 1.4 to 5.0% in Western Europe). In Poland, nearly 100% of deliveries take place in hospitals. Low birth weight (less than 2500 g) babies constituted 5.7% of live births and babies weighing more than 4500 g made up 1.6% (from 4.5 to 8.0% and from 0.7 to 4.3% in PERISTAT data, respectively). Multiple births were 20.33/1000 still- and live births. Fetal death rate was 5.6 from 500 g on and 4.3 for births of 28 and more weeks of gestational age (from 2.6 to 4.7/1000 births in PERISTAT data). Neonatal mortality rate was 5.6/1000 live births, whereas in Europe, most countries have neonatal death rates near 3/1000. Proportion of death in the first 7 days of life among all neonatal death was similar to the majority of European countries

(70–80%) at 74%. Despite the average similarity of Polish perinatal outcomes, geographical and social differences within the country are much larger. Other perinatal indicators in Poland, such as indicators of healthcare during pregnancy, delivery, and the postpartum period, prevalence of congenital anomalies, indicators of maternal health outcomes, and prevalence of breastfeeding practices are not collected systematically or exhaustively or for the whole country or individually.

Conclusions: Poland, despite dramatic changes in reproductive behaviours during transition period, has experienced on average a similar demographic structure of women giving birth, and similar levels for the majority of perinatal outcomes as countries of European Union. However, the neonatal mortality rate needs to improve.

180 THE PREVALENCE OF THE METABOLIC SYNDROME AND CARDIOVASCULAR DISEASE RISK USING THREE PROPOSED DEFINITIONS

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Introduction: The metabolic syndrome (MetS), a concurrence of disturbed glucose and insulin metabolism, overweight, and abdominal fat distribution, dyslipidaemia and hypertension, is associated with subsequent development of diabetes type 2 and cardiovascular disease (CVD). There are a number of definitions of MetS using different criteria, among them those of the World Health Organization (WHO), the European Group for the Study on Insulin Resistance (EGIR), and the National Cholesterol Education Programme (NCEP) expert panel.

Objective: To assess and compare the prevalence of MetS and CVD risk in the Polish population according to WHO, EGIR, and NCEP definitions of MetS.

Methods: There were 6000 subjects aged 35–75 years, participants of the Polish Multicentre Study on Diabetes Epidemiology, who were randomised and invited to take part in the study. For 2838 participants (1225 men and 1613 women) body mass index, waist circumference, blood pressure, fasting and after glucose load glycaemia and insulinaemia, fasting total, HDL and LDL cholesterol, and triglycerides were determined. A standardised questionnaire was used to collect information concerning present and past diseases, actually taken medicaments, family history of CVD and Type 2 diabetes, and lifestyle risk factors. After exclusion of patients with known diabetes, MetS prevalence was assessed according to WHO, EGIR, and NCEP definitions. In the WHO definition, insulin resistance is defined as the highest quartile of the distribution of the HOMA index assessed for population with normal glucose tolerance (NGT). In the EGIR definition, hyperinsulinaemia is defined as the highest quartile of the insulin distribution in NGT population. Logistic regression was used to assess the relative risk of CVD defined as the presence/history of myocardial infarction or coronary artery disease or stroke or proliferative atherosclerosis.

Results: Among 2674 examined subjects (1530 women and 1144 men) MetS was present in 38% subjects (32% of women and 45% of men) according to the WHO definition, in 25% subjects (23% of women and 27% of men) according to the EGIR definition, and in 35% subjects (37% of women and 32% of men) according to NCEP definition. The RR of CVD, standardised for age and gender, was statistically important in subjects with MetS according to the WHO and NCEP definitions (OR 1.25; 95% CI 1.02 to 1.54 versus OR 1.4; 95% CI 1.1 to 1.7). In persons aged <60 years, the risk of myocardial infarction was related to MetS only defined by WHO. In persons aged >60 years, risk of myocardial infarction was not related to MetS.

Conclusions: Although the prevalence of MetS defined by WHO and NCEP is similar, it seems that the definition created by WHO is better at identifying subjects with MetS and risk of CVD, especially in younger age groups.

181 SOCIOECONOMIC INEQUALITIES IN HEALTH STATE IN BRAZIL: RESULTS OF THE WORLD HEALTH SURVEY

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Introduction: The main purpose of health system performance assessment was to subsidise decision makers with reliable information for policy and further improvement of healthcare. As part of the World Health Organization work to support the development of systematic ways of monitoring performance in countries, the World Health Survey was carried out in Brazil, in year 2003.

Objective: To present the socioeconomic inequalities in the health of the Brazilian population.

Methods: The sampling size was 5000 adults (aged $\geqslant$18 years old). The sample design had two stages of selection: in the first stage, 250 census tracts were systematically selected with probability proportional to size. Size of municipality ($<$50 000; 50 000–399 999; 400 000+ population) and urban/rural situation explicitly stratified the primary sampling units. The mean income of the household head in each census tract was used for implicit stratification. In the second stage, 20 households were selected in each tract with equal probability. To examine socioeconomic inequalities, three variables were considered: number of assets (0–3; 4–8; 9+), educational level, and household total monthly expenditure. Analysis of health was based on 2 general questions (self evaluation of health state and difficulty in work or usual activities), on 15 specific questions (trouble in locomotion, self care, sleeping, sociability, cognition, vision, oral health, and animosity), and on 2 more questions on feeling physical pain. All these questions were scaled from 1 (very good or no trouble) to 5 (very bad or much trouble). A summary index of good health was defined as the proportion of participants that responded good or very good for all specific questions.

Results: Overall, 54% of adults reported good or very good health, but the proportion ranged from 40% among those with fewer than four assets, to 73% among those with nine or more assets. For the specific questions, in general, the results showed the same trend: greater trouble among women compared with men, among the oldest compared with the youngest, and among the poorest compared with the wealthiest. The sharpest gradient referred to the absence of all natural teeth: 55% of the lowest socioeconomic level women, aged 50 years or more, had lost all natural teeth whereas this proportion equalled 19% among the richest women of same age. No socioeconomic inequalities were found for the questions related to sociability and animosity, after controlling by age and sex. The summary index of good health showed a very sharp socioeconomic gradient, using either one of the three considered variables.

Conclusions: This study has evidenced that inequality in health is a prominent problem in Brazil. Diminishing health inequalities should be considered as a special target of government policies and health system actions.

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182 | **MOSAIC (MOTHERS' ADVOCATES IN THE COMMUNITY): A RANDOMISED COMMUNITY INTERVENTION TRIAL IN GENERAL PRACTICE TO REDUCE PARTNER ABUSE AND DEPRESSION AMONG RECENT MOTHERS**

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Introduction: Partner abuse is a global phenomenon, affecting 3% of ever partnered Australian and Canadian women in the past 12 months,[1] and has a detrimental effect on women and children's health.[2] Young women of childbearing age are most at risk and abuse can commence, continue, or escalate in pregnancy. Women in disadvantaged communities suffer disproportionate abuse and ethnic minority women are over-represented in refuge/shelters and in homicide statistics. GPs see one or two abused women a week, but most lack the expertise and support to make effective responses.[3] Support for disadvantaged mothers, such as home visiting and mentoring, has been shown in overseas studies to improve both mothers and children's health.[4,5] Advocacy and empowerment has been shown to benefit abused women's wellbeing,[6] but evidence for effective intervention is lacking.[7]

Objectives: The primary aims of Mothers' Advocates In The Community (MOSAIC) are: to reduce by 16% (a) partner abuse and (b) depression among women pregnant or with children under 5 years whom GPs identify as at risk. Its secondary objectives are: a) to strengthen the attachment of at-risk women to their children; (b) to enhance GP case management of family members living with partner abuse; and (c) to enhance effective inter-sectoral collaboration between general practice and community based family violence networks

Methods: The study design is a cluster randomised community intervention trial. To detect a difference of 16% in either partner abuse or depression 1 year after recruitment for α=0.05, and β=0.20, accounting for cluster randomisation (ρ=0.02), attrition and loss to follow up, 350 women in each arm will be required. Following randomisation of 40 GP practices, consenting women (n=350) identified as either abused or at risk by their GPs in 20 intervention practices will be offered the support of trained and trusted community mothers for12 months. The MOSAIC mentor mothers' role is to contact women at least once a week to empower, advocate for, and support women identified as abused or at risk

by their GP. As controls, 350 women in comparison practices will be offered enhanced standard care. Validated measures of partner abuse (composite abuse scale), depression (EPDS), social support (MOS), and attachment (PSI) will be undertaken on recruitment and at the end of intervention. Analysis, adjusted for clustering, will be by intention to treat and ethnographic process evaluation.

Results and conclusions: We will present the background studies and discuss the development and results of the pilot MOSAIC study currently underway.

1. WHO, 2002.
2. Campbell, 2002.
3. Taft, 2004.
4. Olds, 1997.
5. McFarlane and Wiist, 1997.
6. Sullivan and Bybee, 1999.
7. Ferris, 2004.

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183 | **GENDER DIFFERENCES IN TUBERCULOSIS IN RIO, BRAZIL**

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Background: As the leading infectious killer of youths and adults, tuberculosis (TB) kills more women than all other causes of maternal mortality combined.

Objective: To investigate gender differences in the Rio de Janeiro reported cases from January 1995 to December 1999.

Methods: We analyse the reported cases of Rio de Janeiro TB Surveillance System from 1995 to 1999, which included both bacteriologically confirmed and clinically but not bacteriologically confirmed cases, were originated from thirty five primary healthcare units and all hospital (public and private) notifications. The ratio of TB notification rates among women and men was calculated by age group and summarised as age standardised rate ratios in order to allow comparison by age and sex and to facilitate comparisons: $<$15, 15–24, 25–34, 35–44, 45–54, 55–64, $>$65 years.

In all, 55 258 tuberculosis cases were reported to the TB Control Programme of Rio de Janeiro from January 1995 to December 1999.

Results and Discussion: There were 18 428 (33.4%) females and 36 830 (66.6%) males with an exact female:male ratio of 0.5. The mean age for women was 35.9 years and of men 39.0 years. The tuberculin test was performed in 22% (4094) of women and 16% (5937) of men. The rate of positive tuberculin test ($>$10 mm) was 58% (2385) for women and 52% (3093) for men. Female cases reported among previous close contacts were 30.8% (5676) v 23.1% (8510) for males. Nearly all (96.7%) reported cases had chest x ray performed. The radiographic pattern was considered typical for tuberculosis in 15 656 (88.3%) of women and in 33 067 (92.5%) of men. Sputum smears was made in 12 307 (67.3%) women with 65.7% positive cases and in 26 283 (72.8%) with 67.5% positive cases. Although in our study only TB cases were reported, women with tuberculosis had greater rate of tuberculin positive test than men. Several studies demonstrated that, in countries with high prevalence of TB, women of reproductive age have higher progression rates for the disease in the same age group and that puerperal women are subject to an even higher rate of progression than other women. Our observation also supports the idea that disease progression could not be responsible for the lower notification rates among women. Our data showed that there were differences between relative age distribution of tuberculosis notification rate of males and females. From puberty to 34 years old, the female relative rate rose above that of the males. Afterwards the percentage notification rate among men remained higher until old age when the two rate curves tended to approach each other. Extra-pulmonary tuberculosis occurred in 3966 (21.5%) and 6521 (17.7%) of women and men respectively. Genitourinary tuberculosis had a higher female: male ratio.

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184 | **GENDER RELATED DETERMINANTS OF MORTALITY PATTERNS IN THE POLISH ELDERLY**

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Introduction: No comprehensive information has been so far available on the mortality patterns in Central European countries, for example

Poland, where various cultural rules of behaviour, economic factors, and factors related to the effectiveness of medical service influence the mortality patterns of the elderly.

Objectives: To examine and identify the most important predictors of mortality in elderly, taking into account numerous social determinants. This study was carried out for 16 years in Krakow (Poland)

Methods: The baseline study was performed in 1986/87 in a sample of 2605 (902 males and 1703 females) community dwelling people aged 65 years and over, residents of a city. A structured questionnaire on self rated health, past and present chronic conditions, previous and present attitudes to health, health related behaviours, and frequency of seeking medical help was used. Questions referring to living arrangements, marital and family status, past and present occupational activity, early retirement, level of present daily living activity, lifestyle, attitudes to life, self assessment of hierarchy of life values, and sociodemographic data (gender, education, occupation) were also included. Vital status of all individuals under study were ascertained by monitoring city records (1986–2002). The influences of the independent variables measured at the baseline interview upon all cause mortality was estimated 16 years later using the Cox proportional hazard model.

Results: During the 16 year follow up period 620 (68.7%) men and 968 (56.8%) females died. Multivariate regression model demonstrated that risk of death in males increased with early retirement (Expβ = 1.07), and decreased with high level of physical activity (Expβ = 0.95) and good living arrangements (Expβ = 0.89). Multivariate analysis conducted for females showed that risk of death was influenced by the level of education (Expβ = 1.63), living alone (ExpβB = 1.26), and self rated health (ExpβB = 0.86). Additionally multivariate analysis was performed separately for factors from the past and from the present period of life. The multivariate model performed for males based on factors in their past confirmed that risk of death decreased with higher level of education (Expβ = 0.61) and increased with higher number of chronic conditions (Expβ = 1.22). Among females, level of education (Expβ = 1.36) and life orientation towards significant social values (Expβ = 0.82) were significantly associated with the risk of death. Among factors measured at the time of baseline survey such predictors as poor self rated health (Expβ = 1.23 for males, Expβ = 1.29 for females) increased the risk of death, while continuation of occupational activity during retirement in males (Expβ = 0.56) and high level of physical activity in females (Expβ = 0.997) significantly decreased mortality.

Conclusion: This study has identified independent predictors of mortality that are different for males and females and different gender related roles for the same predictors.

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185 **PREVALENCE, AWARENESS, AND TREATMENT OF HYPERCHOLESTEROLAEMIA IN 32 POPULATIONS: RESULTS FROM THE WHO MONICA PROJECT**

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Introduction: Cardiovascular diseases (CVD) cause almost a third of all deaths in the world. High total cholesterol is one of the strong known causal risk factors of CVD, along with high blood pressure and smoking. It is also known that a 1% reduction in total cholesterol can reduce CVD mortality by 2–3%. Several studies have been conducted to estimate the prevalence, awareness, treatment, and control of hypercholesterolaemia. There is no multinationally comparable information on the prevalence of hypercholesterolaemia and its awareness, treatment, and control, because individual studies are often not directly comparable.

Methods: Data from the WHO MONICA Project final risk factor surveys were used. Data were collected between 1989 and 1997 for the 35–64 year age range in 32 populations, in 19 countries on three continents using standardised methods.

Results: The prevalence of hypercholesterolaemia was on average 76% (range 3 to 53%) in men and 74% (range 27 to 87%) in women if it was defined as total cholesterol ≥5.0 mmol/l or use of lipid lowering drugs. When the definition of hypercholesterolaemia was changed to total cholesterol ≥6.5 mmol/l or using lipid-lowering drugs, the prevalence of hypercholesterolaemia was on average 29% (range 3 to 53%) in men and 26% (range 4 to 40%) in women. Awareness of hypercholesterolaemia was on average 19% (range 1 to 33%) in men and 17% (range 0 to 31%) in women. In most populations in men and women, over 50% of those using lipid lowering drugs had a cholesterol level <6.5 mmol/l.

Conclusions: There is wide variation in the prevalence, awareness, and treatment of hypercholesterolaemia between populations. For the planning and implementation of primary prevention programmes and for the development of healthcare systems, such monitoring of changes within and between populations is essential. To obtain reliable information on these changes, well standardised methods need to be applied.

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186 **RELIABILITY OF DIAGNOSES CODED BY OFFICE BASED PHYSICIANS IN GERMANY**

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Introduction: A new payment system based on morbidity measured by codes of the International Classification of Diseases (ICD-10) will be introduced for German statutory health insurance physicians. Concerns have been raised about the validity of the diagnoses used. It has been argued that physicians, using their office software, might carry forward diagnoses automatically even when the disease is no longer present.

Methods: We used the claims data of all statutory health insurance physicians from the region of Lower Saxony in the year 2002 (population approximately 8 million). A random sample of one half of all patients was used for the analysis. The 16 most frequent typically acute diagnoses (mainly infections) and the 28 most frequent typically chronic diagnoses (mainly cardiovascular, metabolic and degenerative conditions such as hypertension, diabetes, asthma, heart failure, hyperlipidaemia, arthrosis, and glaucoma) were selected. We counted how many of the patients with these diagnoses in the first quarter of 2002 had the same diagnoses in the following quarters, through the second quarter of 2003.

Results: There were 798 018 acute diagnoses in the first quarter of 2002; 15.2% of patients had the same diagnoses in the second, 5.6% in the third, 3.6% in the fourth quarter of 2002, 2.6% in the first, and 1.9% in the second quarter of 2003, respectively. The patients in total had 1 948 753 of the chronic diagnoses in the first quarter of 2002; of these, 1 397 179 (71.7%) already had had the same diagnoses in the last quarter of 2001 (group 1). Of these, 88.4% kept their diagnoses in the second, 85.4% in the third, 84.0% in the fourth quarter of 2002, 81.4 % in the first, and 78.6% in the second quarter of 2003, respectively. Of the 551 574 (28.3%) patients who had not had their diagnoses in the last quarter of 2001 (group 2), 41.9% kept their diagnoses in the second, 38.7% in the third, 37.7% in the fourth quarter of 2002, 38.5% in the first, and 35.6% in the second quarter of 2003, respectively.

Conclusions: This analysis does not show whether the coded diagnoses are correct. However, there is no empirical evidence that diagnoses are incorrectly carried forward over time in a substantial number of cases. The high proportion of chronic diagnoses that are no longer present in the following quarters in group 2 deserves further investigation. It is likely that most of these cases represent suspected instead of confirmed diagnoses.

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187 **THE BENEFIT OF SMOKING CESSATION IN PATIENTS WITH CORONARY HEART DISEASE: ESTIMATES BASED ON SELF REPORTED SMOKING DATA AND SERUM NICOTINE MEASUREMENTS**

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Introduction: Smoking cessation has been shown to reduce the elevated risk of coronary heart disease (CHD) of smokers of all ages. In addition, there appears to be a clear beneficial effect of smoking cessation on prognosis even after manifestation of CHD due to a decreased risk of secondary cardiovascular disease (CVD) events. Most existing evidence, however, is exclusively based on self reported smoking data. The complementation of self reported data with biological markers of tobacco exposure may give a more accurate categorisation of the actual smoking status, and hence may help to disclose the full benefit of smoking cessation.

Objective: To assess the impact of smoking measured by self report and by serum nicotine level on the risk of secondary cardiovascular disease events during 1 year's follow up in patients with acute manifestation of coronary heart disease.

Methods: We conducted a cohort study among 1206 patients aged 30–70 years participating in an inpatient rehabilitation programme after acute manifestation of CHD between January 1999 and May 2000. Smoking status at baseline was assessed by self report and serum

nicotine measurements. A follow up was conducted 1 year later to assess subsequent CVD events (physician diagnosed non-fatal myocardial infarction or ischaemic cerebrovascular event, coronary revascularisation procedure, or death caused by CVD). The association between self reported or nicotine based smoking status and the occurrence of secondary cardiovascular disease events was evaluated by means of multivariate logistic regression adjusting for known cardiovascular risk factors (age, sex, body mass index, HDL and LDL cholesterol, triglyceride level, number of coronary vessels affected, and history of diabetes). To minimise potential bias due to imperfect classification of smoking status, the analysis of the association of smoking with secondary cardiovascular disease events was repeated after exclusion of subjects with discrepant classification according to self report and nicotine measurement (of nicotine negative self reported continued smokers and of nicotine positive self reported recent quitters, and former or never smokers).

Results: Of the 967 patients with complete baseline and follow up data, 139 suffered a secondary CVD event during 1 year of follow up. Both self reported smoking status and nicotine level were strongly associated with the occurrence of a secondary CVD event. After exclusion of subjects with discrepant classification of smoking status in both types of measurement, this association became even stronger. Compared with continued smokers, odds ratios (95% confidence intervals) for the occurrence of a secondary CVD event were 0.61 (0.20 to 1.93) for recent quitters (patients who quit after acute manifestation of CHD), 0.52 (0.17 to 1.59) for former smokers, and 0.35 (0.11 to 1.10) for never smokers (p value for trend 0.03).

Conclusion: The benefits of smoking cessation in cardiac patients are beyond controversy and might be even larger than suggested by previous studies, which exclusively relied on self reported smoking status.

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188 | A HISTORICAL COHORT STUDY TO ESTIMATE OCCUPATIONAL MORTALITY RISKS IN NAVARRA

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Introduction: Few studies on occupational mortality have been conducted in Spain. The main problems are the availability of death certificates and the quality of the information on occupation in statistics of mortality.[1]

Objective: To provide point estimates and confidence intervals for occupation specific mortality relative risks in a historical cohort of males from the province of Navarra, Spain.

Methods: The base population for this historical cohort comprised all men from Navarra who were over 34 years old and employed at the time of the 1986 population register. This encompassed 78 994 men followed until end of 2001, rendering a total of 1 213 385 person years. Information was drawn from two datasets: the first source of data was the Navarra mortality register comprising all mortality cases (7609 deaths) from 1986 to 2001, classified according to the ICD 10. The second data source comprised all men in the 1986 population register from where we extracted information on occupation and age. We considered 14 occupational activities and 20 mortality causes. The overall person time that each worker contributed to the study was allocated to the corresponding cells of the variables of stratification: occupation (14 categories) and age groups (35–44, 45–54, 55–64 and >65 years). Age standardised mortality ratios, that is the ratio of the observed to the expected number of cases in any given occupation and mortality cause, were computed taking age specific rates of this study cohort as the reference to obtain the expected number of cases. We also used confidence intervals for the relative risks to evaluate the statistical significance of the results.

Results: Due to space limitations, we only present three mortality causes. For kidney, bladder and other urinary malignant tumours (C64, C67, rest of C64–C68), the occupational activities with the highest estimated SMR were: textile, leather, clothing workers, and shoemakers 2.72 (CI 1.091 to 5.604), administrative workers 1.865 (CI 1.249 to 2.679), catering workers and warehouse men 1.619 (CI 1.002 to 2.474)). For ischaemic heart diseases (I20–I25), the occupational activity with the highest estimated SMR was sale workers: 1.316 (CI 1.055 to 1.621). For external causes of death (V01–Y89), the occupational activities with the highest estimated SMR were farmers and cattle farmers 1.322 (CI 1.127 to 1.540), and construction workers: 1.309 (CI 0.955 to 1.752).

Conclusions: This work contributes to fill the gap on occupational mortality in Spain. We conclude that differences exist in mortality risks with respect to the global risk of Navarra in certain occupational activities for several major causes of mortality. It is remarkable that textile, leather, clothing workers, and shoemakers present the highest estimated mortality ratio when analysing kidney, bladder, and other urinary malignant tumours, a finding that seems to corroborate previous studies.

1. González and Agudo. *Environ Health Perspect* 1999;**107**(Suppl 2): 273–7.

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189 | OFF PUMP CORONARY ARTERY BYPASS SURGERY: A META-ANALYSIS OF RANDOMISED TRIALS

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Objectives: To summarise the evidence on the effects of offpump coronary artery bypass graft surgery (OPCAB) (without cardiopulmonary bypass) on the post-operative risk for death, stroke, and myocardial infarction (MI). We pooled the results of randomised trials comparing the effects of OPCAB with the conventional procedure (CABG).

Methods: Full trial reports, published before 1 January 2004, were harvested from PubMed, EMBASE, CINAHL, Web of Science, and CENTRAL. After methods appraisal and data extraction, results of individual trials were expressed as odds ratio (OR) with a 95% confidence interval (95% CI) according to the intention to treat principle. Using a random effects model (Meta procedure, Stata 7.0.) trial results were pooled according to DerSimonian and Laird. Pooled results are expressed as OR and 95% CI.

Results: In all, 52 reports were retrieved, concerning 42 randomised trials. For 12 trials, no full report was available, and for three trials effect estimates for none of our endpoints were reported, thus 27 trials including 2061 patients (1031 OPCAB and 1030 CABG) remained for further analysis. Methods appraisal showed <10% missing data and conversion rates <5% for nearly all trials, but very few trials concealed random treatment allocation, standardised post-surgical care, and blinded outcome assessment of stroke and MI. On average, most trials included young and male patients, while OPCAB patients received rather fewer grafts. With the exception of MI up to 2 weeks post-surgery, effects for all our endpoints consistently favour the effect of OPCAB. For the composite endpoint (death, stroke and MI) the risk reduction in favour of OPCABwas 24%, 25%, 45%, and 35% at 2 week, 1 month, 3 month, and 1 year follow up, respectively. However, none of the odds ratios reached statistical significance at the conventional level.

Conclusions: The pooled results show important reductions in risk of death, stroke, and MI that clearly favour OPCAB, but these reductions still fail to reach statistical significance. Between 1 January and 14 February 2004, seven randomised trials were reported as a full paper, at least 12 others await publication as full reports, and longer follow up of trials included here also await publication. We will present the latest results of our meta-analysis for death, stroke, MI, and their composite endpoint, which are updated accordingly.

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190 | IMPACT OF PARENTAL SMOKING ON CHILDREN'S MEDICAL CONSUMPTION: A POPULATION BASED STUDY

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Introduction: The adverse effects of passive smoking on children's health and their influence on use of medical services are well known. Few studies have however explored the impact of passive smoking on the medical consumption of children at population level.

Objective: To assess to what extent parental smoking contributes to the medical consumption of children in the Belgian population.

Methods: Data were used from the 2001 Belgian Health Interview Survey, with a total sample size of 12 111 individuals (among which were 1719 children <13 years). Children are considered as being exposed to parental smoking if at least one of the parents smokes daily. Medical requirements were assessed in terms of ambulatory consultations with doctors, admissions to hospital, and use of prescribed medicines in general, and in relation to specific diseases and medicines. Associations between parental smoking and indicators of medical

consumption are presented as odds ratios, adjusted for age, sex, parental education, and level of urbanisation.

Results: Of the children aged <13 years, 36.8% live in a household where at least one of the parents smokes daily. Children of daily smokers reported on average 0.90 ambulatory doctor consultations in the 2 months prior to the survey, versus 0.77 for the others, but this difference is not significant. Children of daily smokers reported significantly more frequent consultation with a doctor for a respiratory problem (adjusted odds ratio 1.73; 95% CI 1.22 to 2.46), and in particular more frequent consultations for acute bronchitis (adjusted odds ratio 2.41; 95% CI 1.43 to 4.07). The population attributable risk percentages were respectively 17.6% and 27.9%. The proportion of children hospitalised in the year prior to the survey was not significantly higher among children of daily smokers, nor was it higher if only hospital admissions are considered that are related to respiratory problems. The use of prescribed medicines in the 2 weeks prior to the survey was significantly higher among children of daily smokers (adjusted odds ratio 1.82; 95% CI 1.28 to 2.58), especially for antibiotics (2.31; 95% CI 1.19 to 4.51). At population level the proportion of antibiotic use in children attributable to parental smoking was 33.3%.

Conclusions: A substantial part of ambulatory doctor consultations of children for respiratory problems was attributable to parental smoking. Similarly, parental smoking was responsible for an important part of the antibiotic use in children. Further action is needed to increase the awareness of the population on the negative outcomes of parental smoking, not only to decrease the health hazards to which children of smoking parents are exposed, but also to reduce the extra medical consumption that results from it.

191 BLOOD PRESSURE RESPONSE TO CALCIUM SUPPLEMENTATION: A META-ANALYSIS OF RANDOMISED CONTROLLED TRIALS

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Introduction: Adequate intake of calcium has been associated with a reduced risk of hypertension.

Objective: To perform a meta-analysis of randomised controlled trials to assess the independent effect of calcium supplementation on blood pressure (BP). Differences in BP response among population subgroups were examined.

Methods: A systematic search for randomised trials of calcium supplementation and BP in non-pregnant subjects was performed in Medline from 1966 to June 2003. Seventy-one trials were identified, 40 of which met the criteria for meta-analysis. Two researchers independently extracted data from original publications on changes in calcium intake (mainly from supplements) and BP. In addition, data on characteristics of the trial populations were obtained, including age, gender distribution, baseline BP, and habitual calcium intake. A random effects model was used to examine the effect of calcium supplementation on BP, overall and in predefined population subgroups. Stratified analyses were adjusted for potential confounders.

Results: Calcium supplementation (mean daily dose: 1200 mg) reduced systolic BP by -1.86 mmHg (95% CI, -2.91 to -0.81) and diastolic BP by -0.99 mmHg (95% CI, -1.61 to -0.37). BP response to calcium supplementation tended to be stronger in people with a low habitual calcium intake ($\leqslant 800$ mg per day) than in people with a higher intake (>800 mg per day) in multivariate analysis, both for systolic BP (-2.63 mmHg (95% CI, -4.03 to -1.24) versus -1.07 mmHg (95% CI, -2.62 to 0.48), respectively) and diastolic BP (-1.30 mmHg (95% CI, -2.13 to -0.47) versus -0.53 mmHg (95% CI, -1.44 to 0.38), respectively).

Conclusion: Calcium supplementation may contribute to the prevention of hypertension, especially in populations with a low calcium intake.

192 THE CHOICE OF SURGICAL STERILISATION AMONG BRAZILIAN COUPLES PROVIDED BY THE PUBLIC HEALTH SYSTEM

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Introduction: The provision of surgical contraceptive methods by the public health system was recently legally approved in Brazil. In the country there is a ''culture'' of female sterilisation. The last Demographic and Health Survey (DHS) pointed out that among married women 15–49 years old, 40.2% were sterilised while among the male partners only 2.6% had undergone a vasectomy.

Objective: To characterise male and female candidates for surgical sterilisation provided by the public health system of Ribeirão Preto, Brazil, and to study the variables associated with choice of the type of procedure.

Methods: A total of 95 candidates records were studied and a statistical monovariate and multivariate logistic regression analysis and Fisher's exact test were performed considering the level of significance at p=0.05.

Results: Most candidates were stable partners with low level of schooling and income. They reported being satisfied with the number of children and had used reversible contraceptives. They had an average age of 34.2 years old; 45.3% underwent female sterilisation while 35.8% underwent vasectomy and 18.9% did nor undergo a procedure. The chance of a man having the vasectomy if he was>35 years old was 6.1 times greater than if he was below this age (OR 6.1), and more married men underwent sterilisation than men with other marital status (OR 4.0). The percentage of women with four or more children that underwent female sterilisation (73.1%) was greater than that of women with less than 4 children (47.1%). These differences are statistically significant (p=0.03), but when they are fitted with other variables in the multivariate logistic regression model no significance was found.

Conclusions: The analysis showed that the influence of the number of children in the choice of the surgical procedure is mediated through marital status and age. The high percentage of vasectomies among the candidates shows that changes regarding male participation in contraception are probably taking place.

193 THE EFFECT OF BIRTHPLACE ON HEAT TOLERANCE AND MORTALITY IN ITALY, 1980–89

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Introduction: The temperature−mortality relationship follows a well known 'J V shape' pattern with mortality excesses at cold and hot temperatures, while the value of minimum mortality temperature (MMT) is used as a proxy of population heat tolerance. As MMT is higher for people living in warmer places, it has been argued that populations will adapt to temperature changes.

Objective: To test this notion by taking advantage of a huge migratory flux that occurred in Italy during the 1950s, when large numbers of unemployed from the south moved to the industrialising north-western regions. We analysed, through an ecological study, the mortality−temperature relationships among residents of Milan (Lombardy) who died between 1980 and 1989, by groups identified by birthplace. We also analysed mortality among Sicilian born residents of Palermo (Sicily).

Methods: Log linear models were used to fit daily death count data as a function of different explanatory variables: months, weekdays, holiday, influenza epidemics, temperature, and relative humidity.

Results: The pattern of mortality−temperature curves differed by birthplace. Curves for natives of Lombardy showed two breakpoints at 19°C (MMT) and 26°C, with no risk for temperatures between two breakpoints: mortality rose sharply over 26°C. For natives of Sicily, residing either in Milan or in Palermo, only one breakpoint emerged at 23°C (MMT), and they shared the same curve pattern and the same increase in mortality risks over this value.

Conclusions: Results suggest that heat tolerance in populations could be modulated by outdoor temperatures experienced early in life, and complete acclimatisation may not occur if external environmental temperatures increase.

194 RISK OF OESOPHAGEAL CANCER IN RELATION TO AMOUNT OF TOBACCO SMOKING, TYPE OF ALCOHOLIC BEVERAGE AND COFFEE CONSUMPTION IN VALENCIA, SPAIN: A CASE–CONTROL STUDY

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Introduction: Tobacco smoking and alcohol drinking are the two strongest risk factors for oesophageal cancer in most Western countries. Most evidence suggests that it is the amount of alcohol consumed, rather

than the particular drink, that determines risk of cancer. However, there is some evidence that the risk could be greater in spirit drinkers and lower among moderate wine drinkers. With respect to coffee consumption and the risk of oesophageal cancer, the existing evidence is very limited.

Objective: To examine the effects of intake of beer, wine, and spirits, and of tobacco and coffee consumption on the risk of oesophageal cancer in a case–control study.

Methods: We conducted a hospital based case–control study between January 1995 and December 1998 in nine hospitals in Valencia and Alicante, Spain. A total of 207 cases, 30–80 years old, with a first histologically confirmed diagnosis of incident cancer of oesophagus were included. A total of 454 controls frequency matched to cases by age (<60; 60–70; 70–80 years), sex, and province were selected from the same hospitals. Trained interviewers using structured questionnaires elicited information on demographic characteristics and risk factors. Adjusted odds ratios (OR) were estimated by unconditional logistic regression including terms for province, age, sex, education, smoking, alcohol, and coffee.

Results: The risk of oesophageal cancer steeply rose with increasing levels of alcohol and tobacco consumption with a strong multiplicative effect on risk. Compared with non-drinkers, ex-drinkers and current drinkers presented particularly elevated ORs (OR for ≥9 drinks/day 19.7; 95% CI 7.5 to 52.0). Number of daily cigarettes was strongly associated with risk (OR for ≥35 cigarettes/day = 5.23; 95% CI 2.23 to 12.28). The risk in the highest joint level of alcohol drinking (≥9 drinks/day) and current smoking (≥30 c/d) was increased more than 100 fold. Compared with smokers of blond tobacco, smokers of black tobacco had, at least, a twofold greater risk of oesophageal cancer. A moderate consumption of 1−2 drinks/day of only wine, or of beer and wine, was not associated with an increased risk (OR 0.72 and 0.79 respectively). Consumption of coffee was significantly associated with an increased risk. The multivariate OR for oesophageal cancer according to coffee consumption categories (none, 1–3, and ≥4 cups per day) was 1.00, 1.37, and 3.83 (95% CI 1.57 to 9.39).

Conclusion: Our data suggest that alcohol drinking and cigarettes smoking are both important risk factors, and the association with alcohol is stronger than that with tobacco smoking. A moderate consumption of only wine or beer and wine (1–2 drinks per day) is not associated with an increased risk. Our data also suggest that coffee consumption (≥4 cups/day) is associated with a statistically higher risk for oesophageal cancer.

195 THE RELATIONSHIP BETWEEN SELF REPORTED DIABETES AND COFFEE AND ALCOHOL CONSUMPTION AMONG ADULTS IN VALENCIA, SPAIN

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Introduction: The prevalence of diabetes mellitus has increased dramatically in the past decades, and the disease now affects more than 5% of adults in most developed countries. Diet and lifestyle factors are primary determinants of risk for Type 2 diabetes. In addition, recent epidemiological studies have found statistically significant inverse associations between diabetes and the consumption of alcohol and coffee.

Objective: To estimate the prevalence of self reported diabetes in an adult Mediterranean population, and explore the association with alcohol and coffee consumption.

Methods: Data for this study were derived from the Nutritional Survey conducted in 1994 in Valencia, Spain. A total of 995 subjects aged 35 years and older who answered the question about diabetes were included in the analysis. Covariates were gender, age, educational level, tobacco smoking, body mass index, and physical activity habits, sleeping time, and alcohol and coffee consumption. Adjusted prevalence odds ratios (POR) were estimated by multiple logistic regression to assess the effects of covariates on the prevalence of diabetes.

Results: The prevalence of diabetes was 12.4% among men and 11.7% among women. Diabetes increased with age, from 4.1% among the 35−49 years age group to 20.6% among the 65 years and older age group. In multivariate analysis, diabetes was inversely associated with moderate alcohol and coffee consumption after adjustment for gender, age, body mass index, and other risk factors. The multivariate POR for diabetes according to regular coffee consumption categories (<1, 1, or ≥2 cups per day) were 1.00, 0.80, and 0.47 (95% CI 0.24 to 0.91; p = 0.001 for trend). Total caffeine intake from coffee and other

sources was also associated with a statistically significant lower risk of diabetes. The multivariate POR for diabetes according to alcohol intake categories (<6, 6–11.9, ≥12 g per day) were 1.00, 0.66, and 0.43 (95% CI 0.22 to 0.85; p = 0.0002 for trend). In addition, the prevalence of diabetes was inversely associated with physical activity at work, educational level ,and sleeping time.

Conclusion: These data suggest that moderate coffee and alcohol consumption are independently associated with statistically significantly lower risk of diabetes in this representative Mediterranean population aged 35 years old and over. Similar results have been recently noted in large prospective cohort studies; however, the reasons for the graded risk reduction associated with coffee remain unclear.

196 INTERACTION BETWEEN FACTOR V LEIDEN AND SERUM LDL CHOLESTEROL IS ASSOCIATED WITH PREVALENT NON-ACUTE CAROTID ATHEROSCLEROSIS AND SEVERE CORONARY ARTERY DISEASE

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Background: Conflicting results exist for an association between the factor V Leiden variant and the risk of non-acute atherosclerotic endpoints.

Objective: To examine those associations, firstly in a population based cross sectional study and secondly, in a case–control study.

Methods: The Study of Health in Pomerania (SHIP) is a survey in the northeast of Germany. A cross sectional study was performed among 2399 SHIP participants aged 45−79 years with the presence (n = 703) or absence (n = 1696) of atherosclerotic carotid plaques as determined by ultrasound. A further case–control study was undergone with a population of 3812 individuals comprising 1021 cases who had undergone invasive coronary treatments and 2791 SHIP participants aged 30−79 years with no present symptoms of atherosclerosis related diseases as controls. Presence of the factor V Leiden variant was determined by PCR and *Mnl*I digestion.

Results: Multivariable analyses revealed a tendency for an association between the factor V Leiden and carotid atherosclerosis (OR 1.44; 95% CI 0.94 to 2.22), but not coronary artery disease (OR 1.21; 95% CI 0.81 to 1.83). However, there was an interaction between the factor V Leiden and serum LDL cholesterol levels in non-diabetics for carotid plaques and in the whole population for coronary atherosclerosis. In both studies, increasing serum LDL cholesterol concentrations exponentially increased the risk for both endpoints in carriers of the factor V Leiden variant but not in non-carriers.

Conclusions: An interaction between the factor V Leiden variant and serum LDL cholesterol is independently associated with the risk of non-acute atherosclerosis of carotid and coronary arteries.

197 DIET, LIFESTYLE, AND ADVANCED AND NON-ADVANCED COLORECTAL ADENOMAS IN MEN

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Introduction: Adenomas larger than 1 cm, with a villous histology or severe dysplasia are postulated to have the highest risk of progression to colorectal cancer. Risk factors for advanced and non-advanced adenomas might differ from each other as these might reflect different stages in the adenoma−carcinoma sequence.

Methods: We examined whether previously identified potential risk factors for colorectal adenomas and cancer are differentially associated with advanced (≥1 cm, report of a villous structure, or carcinoma in situ) and non-advanced adenomas using data on 23 891 U.S. men participating in the Health Professionals Follow up Study who underwent an endoscopy. During 14 years of follow up (1986 through 2000) 3196 histologically confirmed cases of colorectal adenomas were ascertained, of which 831 cases could be classified

as advanced and 1402 as non-advanced. Medical and lifestyle information was collected biennially, and dietary information was collected every 4 years using questionnaires. Logistic regression was used to compare the distribution of risk factors between advanced and non-advanced adenomas, and controls.

Results: Smoking at baseline was more strongly associated with advanced than with non-advanced adenomas; past smoking was positively associated with both to a similar extent, and a family history of colorectal cancer was also similarly associated with increased risk of advanced and non-advanced adenomas. High alcohol consumption, high body mass index (BMI), low physical activity, and low fish consumption tended to be mainly risk factors for advanced adenomas. For other dietary risk factors, no differential effect for advanced and non-advanced adenomas was found.

Conclusions: A family history of colorectal cancer might indicate a genetic susceptibility of developing colorectal adenomas. Smoking might play a role in the development of colorectal adenomas, but might also affect their progression. Alcohol, BMI, fish consumption, and physical activity might affect the progression of adenomas only.

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198 | **MORTALITY, MORBIDITY AND QUALITY OF LIFE FOLLOWING CARDIAC REHABILITATION; RESULTS OF A MULTICENTRE RANDOMISED CONTROLLED TRIAL**

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Introduction: To date, evidence for cardiac rehabilitation (CR) following acute myocardial infarction (MI) is based largely on small trials performed before routine use of thrombolysis and secondary prevention with aspirin, beta blockers and statins. These trials may have little relevance in the context of current clinical practice.

Objective: Over the past 4 years we have been evaluating programmes of CR, as currently provided in the UK, by means of a multicentre randomised controlled trial in 18 acute general hospitals in England and Wales, following patients of both sexes discharged home following MI with minimal exclusions and no age restrictions.

Methods: This randomised controlled trial compared comprehensive CR in outpatient settings with 'usual care' (discharge with written advice). Baseline data were obtained as abstracts of clinical records and by detailed interviews in patients' own homes shortly after discharge. Outcome measures were obtained at 12 months by detailed structured interviews, using previously validated generic and specific scales, including quality of life by the Short Form-36 (SF-36).

Results: There were 2144 patients entered into the trial. At 12 months there were no significant differences between CR and 'usual care' patients in total mortality (6%), cardiac morbidity (non-fatal MI 4%, CABG 5%, PTCA 4%, stroke 1%, and admission to hospital for other cardiovascular disease 9%), or in quality of life in any of eight domains of the SF-36. Change in scores between discharge and 12 months showed relative improvement in one domain 'physical role' 48.8 (34.7) versus 44.3 (35.7) (p~0.01), partly explained by a non-significant difference at discharge. Significant improvements were seen in both groups in five domains, reflecting natural history of recovery.

Conclusions: Cardiac rehabilitation, as currently offered in a representative sample of UK hospitals, offers little benefit to patients following MI.

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199 | **COFFEE CONSUMPTION AND CIGARETTE SMOKING DURING PREGNANCY AND BEHAVIOURAL PROBLEMS IN OFFSPRING: PROSPECTIVE STUDY WITHIN A DANISH BIRTH COHORT**

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Objective: To study if coffee drinking and cigarette smoking during pregnancy are associated with behavioural problems during childhood.

Methods: This was a follow up study carried out in Aalborg and Odense, Denmark, from 1984 to 1987 on 10 916 singleton pregnant women recruited to the Healthy Habits for Two Study. In 2002, 7687 mothers participated in a follow up study and provided information on their singleton children's behavioural problems during their entire childhood. Outcome measures were the Strengths and Difficulties Questionnaire (SDQ-Dan) version for parents.

Results: High coffee consumption (≥8 cups/day) during tpregnancy was associated with risk for increased SDQ scores (odds ratios, OR

2.21, 95% CI 1.67 to 2.91). Children whose mother drank eight or more cups of coffee per day during pregnancy had an increased risk for behavioural problems compared with women who did not drink coffee. After adjustment for habit changing of coffee and smoking, alcohol intake, fish intake, maternal age, marital status, education and employment, there was a slight increase in odds ratios (OR 1.43, 95%, CI 1.04 to 1.95). When we included the effects of cigarette smoking, the risk ratio rose to 4.92 (95% CI 2.38 to 10.16) among the group who had a high level of coffee consumption and smoked more than 20 cigarettes per day.

Conclusion: Both high coffee consumption (>8 cups/day) and smoking during pregnancy are associated with increased risk of behavioural problems in childhood. Meanwhile, caffeine intake slightly affects the probability of behavioural disorders, but may enhance the negative effect of cigarettes.

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200 | **NEWBORNS' PHYSIQUE IN ARMENIA, 1980–2000**

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Introduction: During the past decade, Armenia has been experiencing a deep economic and social crisis, which may have had a negative impact on population health, especially in newborn children as the most vulnerable and sensitive group. Previous studies on population health in Armenia revealed notable changes in core indicators of infant morbidity and mortality and in levels of prenatal care. The results of recently conducted assessment on genetic and environmental influences on the rate of sexual maturity in girls have shown a significant decline in genetic potency of health in the Armenian population.

Objective: To investigate the changes in newborns' physique during the past 2 decades in Armenia. We also compared the rate of physique between boys and girls considering their different responses to socioeconomic changes taken place in the country during the period observed. In order to assess the possible influence of current population genetic structure on newborns' physique, the level of relationship between three indicators (height, weight, and chest circumference) was established.

Methods: As a source of information we used newborns' medical records in maternity hospitals of Yerevan. The number of cases included in this study was 3550. Statistical analysis of data consisted of mean value, standard deviation, and coefficient of correlation in pairs of indicators.

Results: Since 1980, boys and girls have shown notable increase in height. The mean values of weight and chest circumference increased only from 1980 to 1985. After 1985, a steady decrease in mean values of weight and chest circumference of newborns was detected. The results of correlation analysis have revealed the following rates of relationship between height and weight and between height and chest circumference for 1987 and 1999: respectively 0.79 and 0.56 in 1987, and 0.61 and 0.38 in 1999 for boys; and 0.68 and 0.35 in 1987, and 0.67 and 0.45 in 1999 for girls. The results obtained were not significant (p>0.05) but a notable decrease in the value of paired correlation in boys between the two periods was observed.

Conclusions: During the transition period in Armenia, a notable change in newborns' physique has been registered. The past decade is characterised by a notable decrease in the rate of physique for both sexes. In general, newborn boys are more sensitive to the influence of negative socioeconomic changes. Recently established decline in the genetic potency of health in the Armenian population has been proven by weakening the rate of relationship in pairs of physique indicators in boys.

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201 | **EVER USE OF CONTRACEPTION AND PROBABILITY OF CONTINUATION: COMMUNITY BASED SURVEY OF WOMEN IN THE SOUTH OF JORDAN**

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Objective: To reveal the duration of contraception use, its determinants, and the probability of 2 years' continuation.

Methods: A community based survey was conducted in October 2003, targeting women in the reproductive age group residing in the Al-Karak governorate, south of Jordan. A multistage sampling technique was adopted to enrol eligible women. Data were obtained using an

interview questionnaire relying on the retrospective collection of information and analysed using the life table, Kaplan-Meier survival, and Cox regression analysis.

Results: Of the 1109 women enrolled, 61.3% were ever users of contraception, in 1398 segments with a mean duration of 41.23 months and a median of 24.00 months. The cumulative proportion of continuation was 92.41% at 6 months, falling to 65.07% at 12 months and reaching 42.77% at 24 months. Segments of use were significantly longer among women who opted for a contraceptive method above the age of 35 years (87.79 months) and after 15 years of marriage (86.40 months). Segments of use were longer in the presence of four or more surviving children (hazard ratio (HR) 2.62; 95% CI 2.18, 3.15) but shorter in the presence of either all girls (HR 1.81; 95% CI 1.53, 2.16) or all boys (HR 1.53; 95% CI 1.31, 1.79). Relative to all reversible methods, IUD was associated with a significantly longer duration of use (51.89 months) and the highest rate of continuation at 6 months (97.55%), 12 months (77.93%), and 24 months (54.72%). The multivariate Cox regression indicated that women's older age, longer duration of marriage, large number of surviving children, and use of IUD independently predict a longer duration of contraception use. Pregnancy planning was the most frequently stated reason for discontinuation (75.5%) followed by experiencing side effects or fear from adverse effects on fertility (16.1%). Few (5.4%) reported contraception failure, which happened more frequently with local spermicidal methods.

Conclusion: The current rate of contraception use is higher than the 57% reported in 1999. However, such increase is of no complacency as the real target, namely young, recently married women are opting for contraceptives for a short duration and with a high rate of discontinuation at 12 months. Short duration of contraception use and high rate of discontinuation shorten the interval between births, with adverse effects on women and child health, and on population growth. Family planning activities should focus on young newly married women, encourage longer duration of use, promote the concept of small family size, and counteract gender preference.

202 | LUNG CANCER INCIDENCE AMONG MEN IN URBAN AREAS IN THE NORTHWEST OF RUSSIA

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Introduction: At present cancer is the foremost problem of public health. The most common cancer form among men in many countries of the world is lung cancer (LC). The results of the descriptive epidemiological research show the incidence of LC is different in countries of the world, in areas of the same country, and in cities of the same area.

Objective: To evaluate the LC incidence among men in urban areas in the northwest of Russia (the Arkhangelsk region).

Methods: A retrospective ecological epidemiological study was carried out. Incidence of LC for 1982−2001 was studied using the cancer register. The total number of cases was 12 923. The object of the study was the male population in five industrial towns (three with pulp and paper industry (PPI) and two without). Mean incidence for the study period and for 5 year periods (1982–1986, 1987–1991, 1992–1996, and 1997–2001) was used as an outcome variable. The statistical tests were t test and χ^2 test.

Results: Over 20 years the LC incidence in Koryazhma, Novodvinsk, and Arkhangelsk, where PPI are situated, has increased by 1.81, 1.76, and 1.45 times respectively, while in Severodvinsk and Kotlas, where there are other types of industry, the LC incidence has increased by only 1.25 and 1.03 times respectively. In towns with PPI, the LC incidence among men in the second, third, and fourth 5 year periods was significantly higher (p<0.05) than in the first period (1982–1986). In the towns where there is no PPI, the LC incidence among men in second, third, and fourth 5 year periods was not significantly higher (p>0.05) than in the first period (1982–1986). Incidence of LC among men in middle age groups was higher in Koryazhma and Novodvinsk, where more than 30% of the population is employed in PPI, compared with the towns with other types of industry (p<0.05 and p<0.001 for age groups of 40–44 and 45–49 years old). The attributable fraction of the employment in PPI for men in age groups of 40–44 and 45–49 years old in Koryazhma is 35.7% and 48.8% respectively, in Novodvinsk is 42.8% and 28.4% respectively.

Conclusions: This study shows that towns with PPI are subject to increase in LC incidence over a long term period and there is a higher LC incidence among men in middle age groups who are employed in this industry compared with towns with other types of

industry. To identify the role of unhealthy professions and production factors of PPI in the development of LC, a prospective cohort study of LC in age groups of workers and jobs in pulp and paper mills should be carried out.

203 | SHIFT WORK, JOB STRESS AND LATE FETAL LOSS: A STUDY BASED ON THE NATIONAL BIRTH COHORT IN DENMARK

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Introduction: The effects of shift work and job stress on fetal loss have not been well studied.

Objective: To examine with the use of the Danish National Birth Cohort whether shift work or job stress increase the risk of late fetal loss.

Methods: We identified 33 694 pregnancies of daytime workers and 8075 pregnancies of shift workers in women recruited to the Danish National Birth Cohort between 1998 and 2001. Information on job characteristics, including job stress was reported by the women at the interview (11–25 gestational weeks). Pregnancy outcomes were obtained by linkages to the Central Population Register and the National Patient Register, and by personal contacts to cohort members. Hazard ratios (HRs) with 95% confidence interval (CI) of fetal loss were calculated by Cox regression models with left truncation (follow up since the date of the interview) for shift work compared with daytime work, and for high stress jobs compared with low stress jobs. Spontaneous abortion was defined as a fetal loss before 28 weeks of gestation, and fetal loss after this point was classified as stillbirth.

Results: After the interview, 1.3% pregnancies ended in fetal loss. Fixed night work was associated with late fetal loss (HR 1.85, 95% CI 1.00 to 3.42), late spontaneous abortion (HR 1.81, 95% CI 0.88 to 3.72), and stillbirth (HR 1.92, 95% CI 0.59 to 6.24). Job stress, as measured in our study, was in general not associated with late fetal loss, but among fixed night workers, high stress jobs had a high risk of fetal loss (HR 9.58, 95% CI 1.41 to 65.35) compared with other jobs. No high risk of late fetal loss was seen for rotating shift work or fixed evening work.

Conclusions: Our results suggest that fixed night work during pregnancy increases the risk of late fetal loss, especially for high stress jobs.

204 | INTERACTION BETWEEN IMMUNOLOGICAL STATUS AND EUSTACHIAN TUBE DYSFUNCTION IN THE PREDICTION OF RECURRENT OTITIS MEDIA WITH EFFUSION IN CHILDREN

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Objective: To study the combined role of immune status and eustachian tube function in the development of recurrent bilateral otitis media with effusion (OME) in children

Methods: We performed a prospective cohort study in the Otorhinolaryngology outpatient departments of one academic and two general hospitals in Nijmegen and Winterswijk, the Netherlands. The study comprised 136 children aged 2–7 years who received tympanostomy tubes for bilateral OME. Serum was sampled at baseline for analysis of immunological status. Repeated forced response tests were performed to measure ventilatory function of the eustachian tube. Recurrence of bilateral OME within a follow up period of 6 months after spontaneous tube extrusion was the primary outcome parameter.

Results: Univariate analyses for different immunological factors (IgA, IgG1, IgG2, IgG3, IgG4, mannose binding lectin, FcγRIIa-H/R131-genotype) and eustachian tube function) did not show significant associations with recurrence of bilateral OME. Multivariate analyses showed that children with both closing pressures >75th percentile and IgA or IgG2 levels below the 50th percentile of the cohort were

more likely to develop recurrent OME compared with children with closing pressures >75th percentile but IgA or IgG2 levels above the 50th percentile. The corresponding risk ratios were 6.3 (95% CI (CI) 1.0 to 40.1) for IgA and 3.0 (95% CI 1.1 to 8.2) for IgG2. Furthermore these multivariate analyses revealed that increasing levels of functional mannose binding lectin were associated with decreasing probabilities of developing recurrent OME (odds ratio 0.7; 95% CI 0.6 to 1.0).

Conclusions: Development of bilateral recurrent OME depends on the interaction between low IgA or low IgG2 levels and poor eustachian tube ventilation function. In addition, decreased levels of mannose binding lectin predict the outcome.