It is our strong believe that time has come to set up a more systematic approach to monitor the safety of medicine taken during pregnancy.

The EuroMap has explored several design options during the last 4 years; from follow-up studies based upon primary and second data and case-control designs focussing upon congenital malformations. A monitoring system should, in our experience, be based upon a combination of designs in order to be sensitive as well as specific. It has to cover several regions because prescription practice varies and it has to include long-term follow-up.

Due to lack of compliance to prescriptions actual intake has also to be recorded and due to problems with recall-bias case-control studies should be replaced with case-cross-over designs.

Obesity, diet and exercise

162 WHY IS OBESITY MORE COMMON IN MEAT-EATERS THAN VEGETARIANS? EXPLANATORY DIETARY FACTORS IN 56,000 EPIC PARTICIPANTS

E. A. Spencer[1], G. K. Davey[1], P. N. Appleby[1], T. J . Key[1]. *[1]Imperial Cancer Research Fund Cancer Epidemiology Unit, Gibson Building, Radcliffe Infirmary, Oxford OX2 6HE, UK.*

Obesity has a role in the aetiology of diabetes, cardiovascular disease and some cancers, and the prevalence of obesity is increasing. It is of interest to identify dietary factors that determine obesity, an indicator of which is body mass index (BMI). Categorisation of people according to dietary patterns may be useful in identifying dietary factors responsible for variation in BMI. Previous studies show non-meat eaters have lower BMI than meat-eaters, but data on vegans are limited.

A cross-sectional analysis was performed using the Oxford cohort of the European Prospective Investigation into Cancer and Nutrition (EPIC study). This included about 56,000 men and women volunteers, recruited to include a large proportion of vegetarian and vegan subjects. Between 1993 and 1999, subjects completed a food frequency questionnaire with additional questions on health, parity, anthropometric and lifestyle variables. Subjects were categorised into one of four dietary groups: meat-eater (may eat fish); fish-eater (fish but no meat); vegetarian (no meat or fish); vegan (no meat, fish, eggs or dairy products). Body mass index (weight (kg)/height $(m)^2$) was calculated from height and weight data and nutrient information was calculated using McCance & Widdowson's food tables.

53% of the cohort were meat-eaters, 15% fish-eaters, 29% vegetarian and 4% vegan. Age ranged from 20 to 97 with a mean of 45. 9.0% of meat-eaters were obese (BMI>30), compared with 3.9% of fish-eaters, 4.0% of vegetarians and 2.2% of vegans. Preliminary data indicate that intakes of total fat and saturated fat are greatest in meat-eaters and lowest in vegans, and that carbohydrate and fibre intake are significantly higher in vegans and vegetarians than in meat-eaters. The analysis will test the hypothesis that differences in obesity can be explained by differences in intake of total fat, saturated fat, fibre and alcohol.

163 BODY MASS INDEX IN MIDDLE AGE AND IN OLD AGE AND HEALTH STATUS IN OLD AGE

E. Breeze[1], D. Leon[1], R. Clarke[2], A. Fletcher[1]. *[1]Department of Epidemiology and Population Health, London School of Hygiene and Tropical Medicine; [2]Clinical Trial Service Unit, University of Oxford).*

Background: The long-term impact of mid-life body mass index (BMI) on health in old age has not been investigated. The relevance of mid-life and late-life BMI to health in old age is uncertain.
Objective: To explore the interplay of BMI in mid-life (baseline) and late-life (re-survey) on the health status of men in old age.
Design: Postal follow-up re-survey in 1997 of survivors of Whitehall civil servants who were first screened in 1967–70. Anthropometric measures recorded by GPs.
Outcomes: Poor self-reported general health, low score on SF-36 physical performance scale; unable to do at least one activity of daily living (disability).

Abstract 163 Table 1

	Odds ratio (& 95% CI) of poor health for top v lowest quintile of BMI and BMI at the other time		
Adjusted for age	*Poor health*	*Poor physical performance*	*Disability*
BMI in middle age	2.1 (1.2–3.9)	2.6 (1.7–4.0)	2.1 (1.4–3.2)
BMI in old age	0.5 (0.3–0.8)	1.1 (0.7–1.6)	0.9 (0.6–1.3)

Results: Of 8537 men alive at re-survey, 5127 (60%) had BMI measurements at both times. At re-survey, the median age was 77 years, and median follow-up period 29 years; 35% were in a higher, and 26% in a lower, BMI quintile than at baseline. Men in the 40–80th percentiles of BMI at re-survey (25.8–27.7) were least likely to report poor general health. Men with a high midlife BMI (> 27.0) had significantly increased risks of morbidity in old age independent of late-life BMI. The association of current BMI with poor physical performance and disability in old age was J- shaped before adjustment for baseline BMI and U-shaped afterwards.
Conclusion: High BMI in middle age increases the risk of morbidity in old age regardless of BMI in old age. Low BMI in late-life is associated with poor health status in old age, possibly due to reverse causality.

164 CAN HEALTH INTERVENTIONS COUNTERACT THE WIDENING OF SOCIAL INEQUALITIES IN DIETARY FAT AND EXERCISE IN MIDLIFE?

D. R. Boniface, E. McNeilly. *Statistics Group, SEAMS, University of Hertfordshire, Hatfield, UK.*

Introduction: Re-interview evidence from the Health and Lifestyle Survey shows divergence in CHD-related behaviours between different social and economic groups over a seven-year period. This is most notable in dietary fat and exercise in men aged 35 to 49. The aim is to assess the potential of public health interventions for preventing this widening of social inequalities in CHD risk in this age group.
Method: A random sample of adults living in private households in Great Britain was interviewed in 1984 for the Health and Lifestyle Survey and re-interviewed seven years later in 1991. There were 586 men and 671 women aged 35–49 who took part in both interviews. Changes over the seven years in saturated fat intake and exercise were related to social class, education, housing, income and area deprivation. The extent of the divergence between social groups was compared with the magnitude of behaviour changes achieved in recent published intervention studies in free-living populations.
Results: In men, the mean (se) divergence between social groups over seven years in saturated fat intakes was 28g (4.3g) per week in those who had low levels of fat in 1984 and 14g (5.6g) in those who had high levels in 1984. This compares with reductions in weekly saturated fat achieved through intervention trials of around 87g (MRFIT). The divergence between social groups over seven years in proportions of men taking up exercise was around 7% which compares with take-up achieved through interventions of around 12% (meta-analysis).
Conclusions: Current approaches to interventions in diet and exercise, if they can be sustained, are likely to be sufficient to prevent the continued development of social inequalities in these CHD-related behaviours in the 35 to 49 age group provided the interventions are effective in those in less favourable socio-economic circumstances.

165 PHYSICAL INACTIVITY AND MORTALITY IN HONG KONG

T. H. Lam[1], S. Y. Ho[1], A. J. Hedley[1], K. H. Mak[2]. *[1]Department of Community Medicine, University of Hong Kong, Hong Kong; [2]Department of Health, Hong Kong.*

Objective: To study the risks of death attributable to physical inactivity in Hong Kong Chinese.
Methods: Case control study. From December 1998 to January 2000, information on physical activity about 10 years ago of deceased persons (cases) and of surviving persons (controls) was collected from the same informants who applied for death certificates in all 4 death registries. Cases who had chronic ill health or were home bound for 6

years or more before death were excluded. 24079 cases and 13054 controls aged 35 or above were included in the present analysis. Physical inactivity was defined as no exercise for at least 30 minutes during leisure time.
Results: 62% of the cases and 51% of the controls had not exercised during leisure time. After adjusting for age, education, smoking, alcohol drinking and physical activity level of the longest job, the odds ratios (95% CI) for all cause mortality for physical inactivity for the age of 35–69 and 70+ in men were 1.64 (1.44–1.86) and 1.42 (1.29–1.56), and in women, 1.19 (1.07–1.31) and 1.39 (1.28–1.52) respectively. Increased odds ratios with physical inactivity were observed for neoplastic, respiratory, cardiovascular and other causes of deaths. Significant trends of odds ratio increasing with decreasing level of physical activity were observed, except for respiratory (p=0.1) and vascular (0=0.06) deaths in women aged 35–69.
Conclusions: Physical inactivity is an important risk factor for mortality in Chinese. The population attributable risk is high because of the high prevalence of physical inactivity in both genders.

166 RESPIRATORY FUNCTION AND ABDOMINAL OBESITY IN OLDER MEN AND WOMEN: THE EPIC-NORFOLK RESULTS

D. Canoy[1], K. T. Khaw[1]. [1]*Department of Public Health & Primary Care, University of Cambridge.*

Background: An inverse association between respiratory function and body mass index have been reported. However, the relationship with abdominal obesity is not clear. This study examined the relationship of abdominal obesity, measured using waist-hip ratio, body mass index and respiratory function in a large cohort of adult men and women.
Methods: A cross-sectional analysis of baseline waist-hip ratio and body mass index (BMI) in relation to forced expiratory volume in one second (FEV1) and forced vital capacity (FVC) was done on 9903 men and 12151 women aged 45–79 years who were recruited to the EPIC-Norfolk cohort, and attended a health check and completed a health and lifestyle questionnaire.
Results: Mean FEV1 and FVC were lower among those in higher quintiles of WHR than in lower quintiles even after adjusting for age, height, and other covariates including smoking and BMI. The increase of 0.05 unit of WHR was associated with 0.09 L and 0.03 L decrease in FEV1 in men and women, respectively, and with 0.11 L and 0.05 L decrease in FVC in men and women, respectively. The negative relationship was still apparent after excluding cigarette smokers and those with previously known respiratory illness. In men, the effect of BMI independent of WHR was apparent only when smokers and those with prevalent respiratory illness were excluded.
Conclusion: Higher WHR was associated with lower FEV1 and FVC for both men and women even among healthy individuals and independent of BMI. This merits further investigation on the nature of underlying common factors of abdominal obesity and respiratory function.

167 MORTALITY AND BODY MASS INDEX IN A HEALTH CONSCIOUS COHORT

M. Thorogood[1], P. N. Appleby[2], J. I. Mann[3], T. J. Key[2]. [1]*Department of Public Health and Policy, London School of Hygiene and Tropical Medicine, London, United Kingdom;* [2]*Imperial Cancer Research Fund, Cancer Epidemiology Unit, Oxford, United Kingdom;* [3]*Department of Human Nutrition, University of Otago, Dunedin, New Zealand.*

We examined the association of body mass index (BMI) with mortality in the Oxford Vegetarian Study, a prospective cohort of health-conscious individuals living in the United Kingdom. Approximately 40% of the subjects are vegetarians, and the mean BMI in the cohort is low (22 kg m^{-2}). Of 10,800 subjects, 1,102 died before the age of 90 after about 20 years follow-up. BMI was categorized in 2 kg m^{-2} increments (<18, 18-, 20-, 22-, 24-, 26-, 28+). Death rate ratios, relative to the reference category of 20–22 kg m^{-2}, were calculated for all causes of death, all malignant neoplasms, circulatory diseases, ischaemic heart disease, cerebrovascular disease, respiratory diseases, and all other causes combined. After adjusting for age, sex, smoking, social class and previous cardiovascular disease, death rate ratios for all causes combined in the lowest and highest BMI categories were 2.09 (95% CI 1.60–2.73) and 1.25 (0.94–1.67), respectively. Significantly raised death rate ratios in the lowest category of BMI were observed for all cause of death categories examined except for all malignant neoplasms. Significantly raised death rate ratios in the highest category of BMI were observed only for circulatory diseases and ischaemic heart disease. These associations were observed among both young and old subjects, both men and women, among never smokers, among subjects with no previous cardiovascular disease, and after exclusion of the first five years of follow-up. These findings from an unusually slim cohort confirm the U-shaped relation between BMI and mortality and underline the importance of avoiding extreme underweight as well as avoiding obesity.

Miscellaneous

168 MORTALITY PATTERN IN RUSSIA: INDIRECT TECHNIQUE USING SURVEY DATA ON WIDOWHOOD CONFIRMS THE PATTERN SEEN IN NATIONAL ROUTINE DATA

M. Bobak[1], H. Pikhart[1], P. Martikainen[1], R. Rose[2], M. Marmot[1]. [1]*International Centre for Health and Society, Department of Epidemiology and Public Health, University College London;* [2]*Centre for the Study of Public Policy, University of Strathclyde, Glasgow.*

Objectives: The mortality crisis in Russia attracted considerable attention but doubts have been raised about validity of the mortality data. We assessed the use of the indirect technique, developed to estimate mortality in populations without reliable data, for the study of mortality in Russia by data independent from vital statistics.
Methods: Questionnaire data were collected from a national random sample of the Russian population (n=1600). Participants who have ever been married (82% of the sample) were asked about the date of birth and vital status of their first spouse. Mortality of the first spouses of the 531 men and 710 women with complete data were estimated.
Results: The estimated risks of death between ages 35 and 69 years were 57% in male and 17% in female spouses; figures, based on national data in 1990, are 52% and 25% for Russia and 31% and 20% for the United Kingdom. According to female spouses' reports, 38% of their husbands died from cardiovascular disease, 22% from cancer, and 14% of injuries and accidents. Mortality of male spouses was inversely related to education of their wives; the age-adjusted hazard ratios of death from all causes, compared to primary education, were 0.77 for secondary education and 0.57 for university education (p for trend 0.03). Mortality was also inversely related to ownership of household items (p for trend 0.001), but not to size of settlement, pride in Russia, membership in the Soviet Communist Party, nationality or self-assessed social status.
Conclusions: Although this study was relatively small, and mortality in women was probably underestimated (due to high male mortality), we found mortality pattern remarkably consistent with routinely collected data. This technique appears a useful tool to study the determinants of mortality in Russia and other populations without reliable or sufficiently extensive data.

169 COMPARISONS OF CAUSE SPECIFIC MORTALITY RATES IN ENGLAND AND WALES USING ICD-9 AND ICD-10: IMPLICATIONS FOR TIME TRENDS

C. I. F. Rooney[1], L. Cook[1], Z. Uren[1]. [1]*Office for National Statistics, London.*

From January 2001 deaths in England and Wales will be coded to the Tenth Revision of The International Classification Of Diseases (ICD-10). This is the first change in ICD revisions since 1979, and the most important revision since 1948. Changes in classification, especially in the rules for selecting the underlying cause of death from all the conditions mentioned on the death certificate, will have profound effects on cause specific mortality rates. For example, far fewer deaths will be attributed to pneumonias, and more to chronic debilitating diseases.

Those using national mortality data for epidemiological studies, monitoring public health, or evaluating progress toward public health targets need to be able to assess time trends across this change.

ONS is carrying out a bridge-coding study to measure the effects of the change in classification. Deaths registered in 1999 are being independently coded to both revisions, and the numbers of deaths attributed to specific conditions in each compared, using internationally