## P2-306 PLASMA HOMOCYSTEINE LEVELS ACCORDING TO METHYLENETETRAHYDROFOLATE REDUCTASE GENOTYPE AND SERUM FOLATE LEVELS IN A POPULATION-BASED STUDY IN SãO PAULO, BRAZIL

doi:10.1136/jech.2011.142976k. 39
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Introduction Hyperhomocysteinemia is a risk factor of cardiovascular disease. Homocysteine remethylation requires vitamin $\mathrm{B}_{12}$, folate and methylenetetrahydrofolate reductase (MTHFR) enzyme. The common TT homozygosis of the C677T in the MTHFR gene is associated with reduced MTHFR activity. This study aims to assess the impact of serum levels of $B_{12}$ and folate on plasma homocysteine considering C677T polymorphism in a Brazilian sample.
Methods Serum vitamin $\mathrm{B}_{12}$, folate, and homocysteine of 259 participants from a population-based survey in São Paulo, Brazil were used. The genotype for C677T was done with an allele-specific polymerase chain reaction. A generalised linear model with gamma distribution and link identity was applied to model homocysteine according to sex, age, vitamin $\mathrm{B}_{12}$ as well as folate (cut-off at tercile $7.1 \mathrm{ng} / \mathrm{ml}$ ) and C677T polymorphism (non-TT and TT) interaction. Results Significant effects of males ( $p<0.01$ ) and age ( $p<0.01$ ) were found. An increase of $50 \mathrm{pg} / \mathrm{ml}$ in vitamin $\mathrm{B}_{12}$ was associated with a reduction of $0.11 \mathrm{ng} / \mathrm{ml}$ in homocysteine levels $(\mathrm{p}=0.01)$. Finally, an interaction between polymorphism and folate was found ( $\mathrm{p}<0.01$ ), controlling all the covariates. A mean difference of $5.7 \mathrm{ng} / \mathrm{ml}$ of homocysteine levels was observed between below and above folate tercile among TT genotype ( $p<0.01$ ) with a difference of only $1.1 \mathrm{ng} / \mathrm{ml}$ among non-TT ( $\mathrm{p}<0.01$ ). Homocysteine levels among participants with above tercile of folate were similar between nonTT and TT ( $p=0.57$ ).
Conclusion Lower levels of folate are associated with higher levels of homocysteine, but in the presence of TT homozygote homocysteine is even higher.

## P2-307 LATENT MODEL FOR DNA METHYLATION, NUCLEOTIDE SYNTHESIS AND IMMUNE ACTIVATION FOR LUNG CANCER RISK

doi:10.1136/jech.2011.142976k. 40
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Introduction Lung cancer (LC) remains the leading cause of cancer mortality worldwide. In addition to tobacco exposure, low intake of specific micronutrient has been linked to LC. The diet is the main source of vitamins and amino acids involved in the one-carbon metabolism, which is considered key mechanism in maintaining DNA integrity, regulating gene expression, and may thus affect carcinogenesis. Two important branches of the one-carbon metabolism are implicated in cancer: DNA methylation (MET) and nucleotide synthesis (NS). In addition, immune activation (IA) is involved in the ageing process in normal healthy individuals and in a number of pathologies, including cancer.
Methods To investigate the three pathways and their relationships with LC, we applied structural equation models to relate three latent variables corresponding to each mechanism to LC status, controlling for independent effects of tobacco exposure (plasma cotinine). Each latent variable represents one of the mechanisms: MET (methionine, cobalamin, folate and serine), NS (folate, serine, vitamin $\mathrm{B}_{6}$, and Riboflavin) and IA (vitamin $\mathrm{B}_{6}$, Kynurenine/tryptophan ratio and Neopterin). The analysis was conducted using a
data set from a nested case-control from the European Prospective Investigation into Cancer and Nutrition cohort.
Results We have found a direct and protective effect for MET ( $\mathrm{p}=0.011$ ) and IA ( $\mathrm{p}=0.006$ ), meanwhile NS presented only an indirect protective effect ( $\mathrm{p}=0.012$ ).
Conclusion In conclusion, our results support the roles for MET and IA in LC aetiology, whereas the factor representing NS also showed some weak indirect associations. Tobacco remains the predominant predictive factor for LC.

## P2-308 THE CHARACTERISTICS OF PEOPLE WHO HAD BEEN SCREENED TO BE HYPERGLYCAEMIC BUT DID NOT VISIT CLINICS: A RETROSPECTIVE COHORT STUDY

doi:10.1136/jech.2011.142976k.41
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Introduction Diabetes poses a significant threat to quality of life due to serious complications including cardiovascular diseases, and as such, many discussions have focused on screening for diabetes. In Japan, the special health examination ("Tokutei Kenshin") launched in 2008 for all people aged 40-74 includes screening for diabetes. However, some individuals do not make follow-up visits to see a doctor even if they are deemed to be hyperglycaemic at a health check-up.
Objectives To investigate proportions and characteristics of those deemed to be hyperglycaemic through screening but who did not make a follow-up visit.
Design A retrospective cohort study.
Setting and Participants The Japan Medical Data Center's database includes data from health insurance claims and health checkups for 109212 insured individuals.
Main outcome measures Prevalence of follow-up visits after health checkups.
Results We identified 4869 individuals deemed to be hyperglycaemic at health checkups (prevalence, $7.1 \%$ ). Of these, 2432 (49.9\%) did not make follow-up visits after health checkups (men=49.1\%, women $=64.6 \%$ ). Elderly participants were more likely to follow-up after a health check-up where they were told to be hyperglycaemic (OR for NOT making follow-up clinical visit [95\% CI]: 10 years older, 0.70 [ 0.65 to 0.75 ] for men, 0.77 [ 0.59 to 1.01 ] for women).
Conclusions In the present study, almost half of individuals did not follow-up after a health check-up where they were deemed to be hyperglycaemic. Older individuals were more likely to follow-up than younger individuals. Participant characteristics should be taken into account as improvements are made to health check-up services.

## P2-309 IMPACT OF EXCESS WEIGHT ON THE RELATIONSHIP BETWEEN BLOOD PRESSURE AND CARDIOVASCULAR DISEASE: THE ASIA PACIFIC COHORT STUDIES COLLABORATION

doi:10.1136/jech.2011.142976k. 42
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Background Elevated blood pressure and excess weight are established major risk factors for cardiovascular disease (CVD). Previous studies have suggested that hypertension is a greater cardiovascular hazard among obese compared with lean individuals, but the epidemiological evidence is conflicting.
Methods and Results The interaction between systolic blood pressure (SBP) and BMI on fatal or non-fatal coronary heart disease (CHD), ischaemic stroke and hemorrhagic stroke was examined using pooled data from the Asia Pacific Cohort Studies Collaboration. Participants of the study were 419448 men and women aged $>30$ years at baseline. BMI was categorised into five groups (12.0-18.4, 18.5-22.9, 23.0-24.9, 25.0-29.9 and $30.0-60.0 \mathrm{~kg} / \mathrm{m}^{2}$ ). Cox proportional hazard models, stratified by sex and study, were used to estimate HRs adjusting for age and smoking status, and the interaction between SBP and BMI was assessed by likelihood ratio test. During 2619241 person-years of follow-up, there were 10877 CVD events (59\% in Asia, $34 \%$ women, $71 \%$ fatal). For all forms of CVD except haemorrhagic stroke, there was evidence of an antagonistic interaction between SBP and BMI such that the risks of subsequent CHD ( $\mathrm{p}=0.01$ ), ischaemic stroke ( $\mathrm{p}=0.03$ ) and CVD ( $\mathrm{p}=0.001$ ) associated with increases in SBP were higher in normal-weight individuals compared with obese individuals.
Conclusion Increased SBP is an important determinant of subsequent cardiovascular risk irrespective of body size and, in relative terms, lean individuals were shown to have a poorer prognosis for CHD and ischaemic stroke.

## P2-310 GAMMA-GLUTAMYLTRANSFERASE AS A BIOMARKER FOR OXIDATIVE STRESS, METABOLIC SYNDROME, AND ALCOHOL CONSUMPTION AND ITS ASSOCIATION WITH CANCER INCIDENCE

doi:10.1136/jech.2011.142976k. 43
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Background Alcohol consumption, metabolic factors and oxidative stress have consistently been linked to cancer development. Gamma-glutamyltransferase (GGT) is a biomarker for adverse alcohol consumption and oxidative stress. It is highly related to metabolic factors such as hyperglycaemia, dislipidaemia and obesity. We therefore hypothesise that GGT is associated with cancer incidence at different sites.
Methods First visit measurements in 94628 adult women and 80224 men screened for metabolic risk factors as part of the Vorarlberg Health Monitoring \& Promotion Programme (VHM\&PP). During a median follow-up of 13 years, a total of 5136 incident cancers were diagnosed in men and 4665 in women. Sexspecific Cox proportional hazards models, adjusted for age, bodymass index and smoking were performed to estimate HRs and $95 \%$ CI per quintiles of GGT.
Results In males, there were associations (highest vs lowest quintiles) of GGT with liver cancer ( $\mathrm{HR}=16.50,4.00-68.19$ ), cancers of the lip, oral cavity, pharynx and larynx ( $\mathrm{HR}=3.80,2.33-6.20$ ), oesophageal cancer ( $\mathrm{HR}=2.39,1.01-5.72$ ), pancreatic cancer
( $\mathrm{HR}=2.13,1.01-4.56$ ), lung cancer $(\mathrm{HR}=2.04,1.55-2.70)$, bladder cancer ( $\mathrm{HR}=1.76,1.11-2.77$ ), kidney cancer $(\mathrm{HR}=1.61,0.92-2.82$, p for trend $=0.009$ ) and colorectal cancer ( $\mathrm{HR}=1.36,1.01-1.83$ ). In females, the association was most pronounced in cervical cancer ( $\mathrm{HR}=3.77,1.94-7.32$ ), followed by lung cancer $(\mathrm{HR}=1.63$, $1.02-2.60)$, endometrial cancer ( $\mathrm{HR}=1.42,0.98-2.05, \mathrm{p}$ for trend $=0.013$ ) and breast cancer ( $\mathrm{HR}=1.19,1.02-1.39$ ).
Conclusions GGT is a highly promising marker for risk stratification in cancer prevention.

## P2-311 CONSISTENCY BETWEEN THE MEASUREMENTS OF CHRONIC MORBIDITY IN A HEALTH INTERVIEW SURVEY and a POPULATION CENSUS

doi:10.1136/jech.2011.142976k. 44
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Introduction The mode of data collection may affect the outcome of a health indicator. This study aimed to examine the consistency between answers to an identical question on chronic morbidity obtained through a face-to-face interview in a health interview survey (HIS) and a self-administered questionnaire from a population census.
Methods During the last quarter of 2001, 2710 people aged 15 years and older participated both to a census and a HIS in Belgium. An individual linkage was performed between the two data sources by using the National Population Registry ID number. Consistency of answers to the question on chronic morbidity was assessed by the $\kappa$-statistic.
Results The prevalence of chronic morbidity was $29.4 \%$ (HIS) and $26.6 \%$ (census). Consistency was relatively poor, with a $\kappa$-statistic of 0.56 ( $95 \%$ CI 0.52 to 0.60 ). The $\kappa$-statistic did not differ by gender, but was substantially lower among persons aged 75 years and older ( 0.44 ; $95 \%$ CI 0.41 to 0.48 ) than among younger individuals ( 0.55 ; $95 \%$ CI 0.51 to 0.59$)$. The $\kappa$-statistic was also lower for non-Belgians ( 0.43 ; $95 \%$ CI 0.40 to 0.47 ) than for Belgians ( $0.57 ; 95 \%$ CI 0.54 to 0.61 ). Consistency differed further among educational groups, although no real educational gradient was observed.
Conclusion There was no satisfactory correlation between selfreported chronic morbidity data in the HIS and the population census. The consistency also differed across population subgroups. The mode of data collection appears to impact the estimates. Estimates and sociodemographic determinants of self-reported chronic morbidity should be interpreted cautiously.

## P2-312 ASPIRIN USE IN CARDIOVASCULAR DISEASE PREVENTION: A POPULATION-BASED STUDY

doi:10.1136/jech.2011.142976k. 45
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Objective To estimate the prevalence of aspirin use in primary and secondary prevention of cardiovascular disease.
Methods Population-based cross-sectional study was carried out in Pelotas, Southern Brazil, between Jan and May/2010, with people aged $\geq 20$ years old. This study had two outcomes: aspirin use in primary prevention (people $\geq 40$ years old, with at least two risk factors: Hypertension, Diabetes Mellitus and/or hyperlipidaemia) and aspirin use in secondary prevention (previous history of stroke and/or angina/myocardial infarction). The outcomes were analysed

