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

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**Introduction** Hyperhomocysteinemia is a risk factor of cardiovascular disease. Homocysteine remethylation requires vitamin B12, folate and methylenetetrahydrofolate reductase (MTHFR) enzyme. The common TT homozygosity of the C677T in the MTHFR gene is associated with reduced MTHFR activity. This study aims to assess the impact of serum levels of B12 and folate on plasma homocysteine considering C677T polymorphism in a Brazilian sample.

**Methods** Serum vitamin B12, 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 considering sex, age, vitamin B12 as well as folate (cut-off at tercile 7.1 ng/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 pg/ml in vitamin B12 was associated with a reduction of 0.11 ng/ml in homocysteine levels (p = 0.01). Finally, an interaction between polymorphism and folate was found (p < 0.01), controlling all the covariates. A mean difference of 5.7 ng/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 ng/ml among non-TT (p < 0.01). Homocysteine levels among participants with above tercile of folate were similar between non-TT 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

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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 B6 and Riboflavin) and IA (vitamin B6, 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 (p = 0.011) and IA (p = 0.006), meanwhile NS presented only an indirect protective effect (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.