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 according to sex, age, vitamin B12 as well as folate (cut-off at tercile distribution and link identity was applied to model homocysteine considering 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 tertile 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 tertile 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 homocysteoyte homozygote is even higher.

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/trypotphan 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.
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 haemorrhagic stroke was examined using pooled data from the Asia Pacific Cohorts Study Collaboration. Participants of the study were 419,448 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 kg/m²). 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 2,619,241 person-years of follow-up, there were 10,877 CVD events (59% in Asia, 34% women, 71% females, the association was most pronounced in cervical cancer (HR = 1.76, 1.11–2.77), kidney cancer (HR = 1.61, 0.92–2.32, p for trend = 0.009) and colorectal cancer (HR = 1.56, 1.01–2.75). In females, the association was most pronounced in cervical cancer (HR = 1.77, 1.94–7.32), followed by lung cancer (HR = 1.63, 1.02–2.60), endometrial cancer (HR = 1.42, 0.98–2.05, p for trend = 0.013) and breast cancer (HR = 1.19, 1.02–1.39).

Conclusions GGT is a highly promising marker for risk stratification in cancer prevention.