Methods We evaluated 1771 adolescents at 13 year old as part of a population-based cohort study (EPITeen). Sleep duration was estimated by the difference between self-reported usual bedtimes and wake-up times and adolescents were classified in three categories: ≤ 8.5 h (reference class), > 8.5 h and < 9.5 h and ≥ 9.5 h. Blood pressure (BP) was measured with a mercury sphygmomanometer using the auscultatory method, and hypertension was defined according to the American Academy of Pediatrics criteria. To evaluate the association between BP and sleep duration, OR and respective 95% CI, were computed, using the binary regression models adjusted for parents' education, BMI and caffeine intake.

Results The mean (SD) sleep duration was 9.04 (0.80) hours per day. The prevalence of hypertension was 22.4% and it was significantly higher among males (54.8% vs 45.2%; $p=0.001$). After adjustment, in females, a positive association was found between sleep duration and hypertension (> 8.5 h and < 9.5 h: OR=1.61, 95% CI 1.07 to 2.44; ≥ 9.5 h: OR=1.75, 95% CI 1.13 to 2.70). Among males an inverse association was found, significant only in those who slept ≥ 9.5 h (OR=0.62, 95% CI 0.40 to 0.95).

Conclusion Sleep duration was positively associated with the odds of hypertension occurrence in females, but the opposite association was found in males.

P2-234 SELF-REPORTED HEARING LOSS AND USE OF HEALTH SERVICES FOR ELDERLY: A POPULATION BASED STUDY IN SÃO PAULO CITY, BRAZIL

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Introduction Hearing loss has been identified as one of the most frequent chronic conditions affecting elderly people and can be result in social isolation, depression and increased dependency. The use of health services to preventive ends it is important to evaluate the health behaviours of elderly with disabilities.

Methods Data are from the Survey of Health of São Paulo (ISA-Capital), a population-based cross-sectional study ($n=3357$). We analysed the subgroup of elderly (60 years and above - $n=872$) to determine the association between reported hearing loss and use of health services: immunisation against *influenza* in last year, participation in prevention programs: prostate cancer, breast cancer and cervical cancer. We used the χ^2 test of association and analysis of Poisson regression (significance level: 0.05).

Results The prevalence of hearing loss in elderly people was 11.2% and it was higher in men than women ($p=0.00$). 60.5% of the elderly related to take immunisation against *influenza*, 82.9% of the women referred to participate the program of prevention of cervical cancer and 64.1% referred to participate the breast cancer one. There was an association between self-reported hearing loss and participate in programs to prevent prostate cancer (RP: 1.8; $p=0.03$).

Conclusion Self-reported hearing loss can be itself a revelation indicator of handicap and it is quick and inexpensive to be performed. These data should be a tool to evaluate of the use of health services and moreover they could help to plan of hearing rehabilitation services.

P2-235 VERBAL FLUENCY TESTS RELIABILITY IN A BRAZILIAN MULTICENTRIC STUDY, ELSA BRASIL

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Introduction Because of the pronounced and fast population ageing of low and middle-income countries, dementia is now a leading cause of disability. Verbal Fluency Tests (VFT) were used to assess cognitive functions in ELSA (Longitudinal Study of Adults' Health - Brasil), a cohort that investigates incidence and predictors of chronic diseases among 15 000 civil servants (35–74 years old). The performance in VFT needs to be evaluated by a trained investigator, in order to count the words excluding repetitions and intrusions. As multicentric studies have to concern about the homogeneity of their interpretation, this study investigates the reliability of VFT scoring by supervisors of the six ELSA research centers, who independently judged 120 category (animals) and 120 phonemic (F letter) tests.

Methods The scores were compared to a reference standard score obtained by independent judgement of two experts and ratings reliability obtained by Intraclass Correlation Coefficient (ICC) and Bland-Altman plot.

Results Scores were very similar among centers and a high level of agreement was observed between each center and the reference standard. ICC values for both tests varied from 0.979 (95% CI 0.970 to 0.985) to 0.987 (95% CI 0.981 to 0.991). The Bland-Altman plot showed that the mean difference is small for both tests, and 95% of scores are located between the mean and 2 SDs.

Conclusion These results show the importance of the implemented measures of quality assurance and control and allow ELSA to proceed upon its main objective, to identify social, psychological and biological predictors of cognitive decline in a Brazilian adult population.

P2-236 BETTER COGNITIVE FUNCTION ASSOCIATED WITH WHO RECOMMENDED FRUIT AND VEGETABLE INTAKE IN A LOW-INCOME ELDERLY POPULATION IN BRAZIL

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Globally, cognitive deficit and dementia are among the major age-related chronic disorders. Daily consumption of fruit and vegetables has been associated with a diminished risk of cognitive deficit later in life. We examined whether the WHO recommendations of a daily intake of five servings of fruit and vegetables (≥ 400 gm) were associated with cognition in a low-income elderly population in the city of São Paulo. We explored the influence of socio-demographic characteristics, lifestyle factors and health measures on this association.

Methods We performed a cross-sectional analyses with 1849 participants ≥ 65 years old, free of dementia, at the baseline of the population-based prospective SPAH study. Cognition function was assessed using the Community Screening Instrument for Dementia (CSI-D), (scored as 0–30). Few cases with scores =0 were excluded. Cognitive deficit was defined as scores ≤ 1.5 SDs of the mean population (CSI-D scores ≤ 20.93). Fruit and vegetable intake was estimated using a Food Frequency Questionnaire. The association between cognition and fruit and vegetable intake was investigated using multiple linear and logistic regression models.

Results Multivariate analyses showed that a higher intake of fruit and vegetables was associated with higher cognitive scores. Individuals who consumed ≥ 400 g/day presented a significant 42% lower risk of cognitive deficit. Nevertheless, adjusting for education significantly attenuated this association.

Conclusion A high fruit and vegetable intake may help preserve cognitive function in the elderly, but education is a powerful confounder and may play an important role, especially in a low-income population.

P2-237 β -CAROTENE IS ASSOCIATED WITH REDUCED RISK OF COGNITIVE FUNCTION IN LOW- INCOME ELDERLY FROM SÃO PAULO, BRAZIL

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Introduction The influence of individual antioxidant vitamins on cognitive function in older adults remains uncertain. Randomised trials of dietary interventions have yielded mixed findings. We examined the relation between dietary carotenoids and vitamin C intake from fruit and vegetables and the cognitive function of a low-income population from Sao Paulo.

Methods Cross-sectional analyses of 1849 elderly ≥ 65 years old, free of dementia, at the baseline of the SPAH study. We estimated the usual intake of vitamin C, α -carotene, β -carotene, β -cryptoxanthin, lycopene, lutein and zeaxanthin by means of a Willet-like FFQ. Cognition function was assessed using the Community Screening Instrument for Dementia (CSI-D) (scored as 0–30). Few cases with score = 0 were excluded. The association between cognitive function and the intake of each antioxidant was investigated using multiple linear regression models.

Results After adjusting for age, gender, education, per capita income, physical activity, HDL-cholesterol, hypertension, stroke, smoking, alcohol consumption and BMI higher β -carotene intake was associated with higher cognitive function scores ($\beta=0.2$; 95% CI 0.1 to 0.3; $p<0.001$ for 1 mg of β -carotene); that is, those participants in the highest quartile of β -carotene intake (3.2–7.2 mg/d) had a mean increased of almost 1 point in their cognitive function scores compared to those in the lowest quartile (0–0.9 mg/d), ($\beta=0.95$; 95% CI 0.52 to 1.11; $p<0.001$). None of the others antioxidants were associated to cognitive function.

Conclusions Higher intakes of β -carotene were associated to better scores of cognitive function in a low-income Brazilian population.

P2-238 A HIGH FRUIT AND VEGETABLE INTAKE IS ASSOCIATED WITH A REDUCED RISK OF CATARACT IN THE SPANISH EUREYE STUDY

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Introduction Cataract is among the major causes of vision impairment and blindness worldwide. Epidemiological studies support the role of antioxidants in the aetiology of cataract, but the evidence for one specific antioxidant over another is inconsistent. We examined the associations between cataract and fruit and vegetable intake and dietary and blood levels of carotenoids, vitamin A, C and E.

Methods Cross-sectional population-based study with 583 elderly ≥ 65 , from Alicante province, participants of the European multi-centre EUREYE study. Cataracts were diagnosed using a slit-lamp examination. Energy-adjusted intake of antioxidant vitamins was estimated using a semi-quantitative food frequency questionnaire. Plasma concentrations of vitamin C were analysed by a colouri-

metric method and carotenoids by a HPLC method. The associations between cataract and quartiles of fruit and vegetable intake and antioxidants were investigated using multiple logistic regression models.

Results After adjusting for other factors, participants in the highest quartile of fruit and vegetable intake (>575 g/day) had a reduced risk of cataract, (OR=0.42; 95% CI 0.23 to 0.79; p -trend <0.001). Intakes of vitamin C of 143–408 mg/d, and vitamin E of 9.3–10.7 mg/day, showed a significant lower risk of cataract, (OR=0.34; 95% CI 0.14 to 0.82) and (OR=0.41; 95% CI 0.20 to 0.82), respectively. Plasma α -tocopherol levels from 31.2 μ mol/l were also associated with a decreased risk (OR=0.30; 95% CI 0.15 to 0.60).

Conclusions High intake of fruit and vegetables, vitamin E and C was associated with a significantly decreased risk of cataract in this older Mediterranean population.

P2-239 ASSOCIATIONS BETWEEN SEX HORMONES AND BONE MINERAL DENSITY AND BONE RESORPTION IN 50-YEAR-OLD MEN: THE NEWCASTLE THOUSAND FAMILIES STUDY

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Introduction While much research relating sex hormones to bone health has centred on oestrogen deficiency in postmenopausal women, far less is known regarding the potential for sex hormone levels to influence bone health in men. We investigated the influence of sex hormone concentrations on bone health in men at age 50, using data from the Newcastle Thousand Families Study.

Methods The study included 171 men who attended for DEXA scanning (giving measures of bone mineral density (BMD) for the hip and lumbar spine) and also gave blood samples allowing measurement of concentrations of testosterone, oestradiol, sex hormone binding globulin (SHBG), free androgen index (FAI), free oestrogen index (FEI), luteinising hormone (LH), follicle stimulating hormone (FSH), free testosterone and serum β C-telopeptide of type 1 collagen (CTX), a biochemical marker of bone resorption.

Results There were significant correlations between total hip BMD and FEI ($p=0.03$), total spine BMD and SHBG ($p=0.006$), FEI ($p=0.008$) and FAI ($p=0.008$) and serum CTX and free testosterone ($p=0.016$). After adjustment for body weight the only associations that remained were between total spine BMD and FAI ($p=0.046$) and between serum CTX and free testosterone ($p=0.014$).

Conclusions Our results suggest that while there are associations between serum sex hormone concentrations and BMD, they are mostly explained by an adjustment for contemporary body weight. The inverse association between serum CTX and free testosterone is more robust, remaining significant after adjustment. This suggests that free testosterone levels are independently associated with bone resorption levels.

P2-240 TIME TRENDS IN MORTALITY FROM CARDIOVASCULAR DISEASES AND CANCER IN PORTUGAL BETWEEN 1985 AND 2005

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Introduction We aim to describe time trends in death rates from cardiovascular diseases (CVD) and cancer in the Portuguese