into eight food groups, based on the DASH diet. The pictures of food items were useful to remind patients of the components of food groups. As a result, FFQ was quickly applied, in approximately 20 and 16 min for FFQ at 30 and for 7 days, respectively.

Conclusion This first step allowed detecting that the FFQ for food groups was feasible at seven and 30 days, and no major issues were detected during the testing.

P1-506 MULTILEVEL MODELLING OF SURVEY DATA

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Introduction Presently, about five million people worldwide die yearly from tobacco related diseases. The WHO currently estimates that there are 1.3 billion people who are regular smokers.

Objectives of data analysis To develop two level random effects logistic regression model for the analysis of clustered binary responses to identify factors associated with smoking among school going male adolescents. To assess if the variability between schools is different for the public and private schools using a random coefficient model. Two random effects will account for the variability between public and private schools respectively. To fit a contrasting Generalising Estimating Equation model to deal with two level clustered data for binary outcome. To compare and evaluate the results from the above mentioned models with a conventional logistic regression model as used in the original study.

Methods A two-stage cluster sampling with stratification based on school type was employed for the selection of schools and students. We interviewed 772 male secondary school students. The outcome variable is smoking status of the students. We have two level data with a single level of clustering.

Results Final multilevel random effect model showed that between cluster variance is significantly different from zero (*p* value of likelihood ratio test =0.01), which indicates that there is variability between schools and we need to take between cluster variation into account by using multilevel modelling. The Intra-class Correlation quantifies consistencies among observations within each cluster and it is also greater than zero (*ICC* =0.15).

P1-507 POLYMORPHISMS IN GENES RELATED TO SEX STEROID TRANSPORT AND SIGNALLING MODULATE MENOPAUSAL HORMONE THERAPY EFFECT ON RISK OF COLORECTAL CANCER

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Introduction Menopausal hormone therapy (MHT) has been associated with reduced colorectal cancer (CRC) risk. Since the underlying biological mechanisms of MHT effects on CRC are unknown, we investigated whether single nucleotide polymorphisms (SNPs) in genes related to sex steroid metabolism, transport and signalling modify MHT-associated CRC risk.

Methods 47 SNPs in 16 candidate genes related to sex steroid transport (ABCB1), metabolism (COMT, CYP1A1, CYP1A2, CYP1B1, CYP2C9, CYP2C19, CYP3A4, CYP17A1, GSTP, HSD17B1) and signalling (ESR1, ESR2, SHBG, PGR, NR1I2) were genotyped using genomic DNA samples from 685 female postmenopausal CRC patients and 684 controls without CRC of a German population-based case-control study (DACHS). Unconditional multivariate

logistic regression was performed and effect modification was assessed using a multiplicative interaction term.

Results CRC risk associated with ever MHT use as well as with duration was significantly modified by rs1202168 in ABCB1 (*p* interaction =0.04). The MHT-associated risk reduction was no longer significant in homozygous non-carriers, while homozygous carriers of the minor T allele had a 57% lower risk with ever use of MHT and a 22% lower risk per 5 years of MHT use. Significant effect modification was also observed for rs910416 in ESR1, whereby the decreased CRC risk was attenuated in carriers of the minor C allele (*p* interaction =0.03 for ever use and 0.07 for duration of use).

Conclusion Our results provide the first evidence that polymorphisms in sex steroid-related genes may modify CRC risk associated with MHT. Our findings warrant replication in independent study populations.

P1-508 OESTROGEN RECEPTOR β EXPRESSION IN COLORECTAL CANCER

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Introduction The oestrogen receptor β (ER β) is the primarily expressed ER in the large intestine and has been found to have inhibitory effects on colon cancer cells. We therefore investigated, whether the ER β expression in tumour tissue from colorectal cancer (CRC) patients is associated with tumour/clinical characteristics.

Methods We used tissue micro arrays consisting of paired normal and tumorous tissue samples from 1262 CRC cases of a German population-based case-control study (DACHS). ER β expression was measured via immunohistochemistry. Multinomial logistic regression was used to assess the association of ER β expression with tumour/clinical characteristics.

Results Measurement of ER β expression was successful in 1101 patients. ER β was strongly expressed (>50% positive cells) in normal intestinal tissue, whereas high ER β expression was found in 16%, moderate expression in 29% and no expression in 42% of tumour samples. Strong vs no expression of ER β was inversely associated with higher UICC stages (stage II OR=0.42, 95% CI (0.26 to 0.66); stage III OR=0.40, 95% CI (0.25 to 0.65); stage IV OR=0.52, 95% CI (0.29 to 0.92); *p* trend=0.01). Furthermore, cases with strong ER β expression had a significantly smaller tumour extent (T2 OR=0.51, 95% CI (0.24 to 1.10); T3 OR=0.24, 95% CI (0.11 to 0.49); T4 OR=0.24, 95% CI (0.10 to 0.60); *p* trend<0.001) than cases with no expression. No significant associations were seen with histopathological grading, nodal status, distant metastasis, tumour localisation, neoadjuvant treatment, age or sex.

Conclusion We observed an association between high ER β expression and smaller tumour extent and confirmed previous reports of an association between high ER β expression and less advanced tumour stages.

P1-509 STUDY AETIOLOGY OF LACTATION FAILURE IN NEONATAL AFFECTED BY HYPERNATREMIC DEHYDRATION: A CASE CONTROL STUDY

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Background Inadequate milk supply in exclusively breastfed neonates can lead to neonatal hypernatremic dehydration in the first

week of life. Identification of causes of lactation failure can help to find susceptible neonates and to find suitable ways for reducing the incidence of this complication. The aim of this study was to determine causes of insufficiency of breast milk in neonates with hypernatremic dehydration.

Methods In a case control study possible maternal risk factors of lactation failure in 25 term infants who were admitted to the hospital for hypernatremic dehydration compared with a control group, 50 healthy full term neonates were selected. They were matched through data collection with interview, examination and filling questionnaire methods.

Results In this study the mean age of mothers with dehydrated cases in comparison with control group was less and the difference was statistically significant. Mean while mothers of dehydrated group had a high level of education, with high first experience of pregnancy, and had an unusual modes of delivery. In this group mothers had a low level knowledge in lactation and also anatomical problems of breast.

Conclusion Hypernatremic dehydration is a common preventable threat to exclusively breastfed neonates. Because of existence of multiple causes for occurrence of this event. The best way for prevention is meticulous observation of breastfeeding in the first few days of life. Until with advent of breastfeeding problem.

P1-510 RELIABILITY AND RELATIVE VALIDITY OF FOOD-FREQUENCY QUESTIONNAIRE BASED ON FOOD GROUPS DEVELOPED FOR CHILDREN, RIO DE JANEIRO/BRAZIL

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Introduction The evaluation of children food consumption is a challenge due to errors and bias of measurement, as well as due to the lack of efficient dietary assessment methods to estimate the intake among this age group. The objective of this study was to assess the reliability and relative validity of a food-frequency questionnaire (FFQ) designed to estimate food intake of children from metropolitan area in Rio de Janeiro/Brazil.

Methods This study enrolled 107 children, both genders, aged 2 to 5-years-old. The FFQ's food list included 73 food types and eight portion size options. Four 24 h dietary recalls were used as the reference method. Total energy intake and 14 food groups were estimated based on four 24 h dietary recalls and two FFQ. The reliability was estimated by Spearman and intra-class coefficients (ICC). Analyses included quartiles using weighted κ coefficient. The relative validation was assessment by Spearman coefficients and Bland-Altman method among estimated food groups.

Results The means of first FFQ were significant higher than 2nd FFQ for energy, cereals, sugar drinks, cookies, sweets, sausages, and meat. The Spearman coefficients ranged from 0.24 (bean) to 0.77 (infants foods). ICC ranged from 0.22 (bean) to 0.98 (lettuces). The weighted κ ranged from 0.20 (cereals) to 0.47 (fats). To relative validity, the Spearman coefficients ranged from 0.03 (meat) to 0.51 (infants foods).

Conclusion The FFQ evaluated may be a suitable instrument for evaluating children dietary intake based on food groups. However, the 24 h dietary recall provided the best estimation for young children.

P1-511 INCONSISTENCIES IN RACIAL CLASSIFICATION AND FOOD INSECURITY AMONG BRAZIL'S LOW-INCOME POPULATION

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Introduction Race has been widely used in studies on health and healthcare inequalities. Validity and reliability problems with race measurement are of concern in public health. This study investigated the agreement between self-assessment and observer's assessment of the skin colour classification, considering the influence of socioeconomic and demographic factors as well as food insecurity.

Methods A cross-sectional population-based study (1085 households) was carry out in 2005, in metropolitan area of Rio de Janeiro, Brazil. Food insecurity was estimated according Brazilian Scale of Food Insecurity. Race/skin colour was evaluated in five characteristics in according to Brazilian scale (white, black, mulatto, Asian and indigenous) by the interviewers and in an open-ended question answered by the respondent self-classified race spontaneously. The reliability between self- and interviewer-classification was estimated using agreement proportions and a weighted κ coefficient (k) for the full sample, stratified by socio-economic factors and food insecurity.

Results White individuals were classified most consistently, particularly those with more favourable socioeconomic conditions. Weighted κ values were higher at higher income levels ($k=0.79$; 95% CI 0.77 to 0.80) and higher levels of education ($k=0.79$; 95% CI 0.75 to 0.81). The most severe levels of food insecurity were strongly associated with low of socioeconomic strata. The consistency of classification of race/skin colour was higher among individuals with food security ($k=0.81$; 95% CI 0.78 to 0.83) and lowest among those with severe food insecurity ($k=0.69$; 95% CI 0.66 to 0.73).

Conclusion The results suggest a tendency towards the whitening of participants from families with food security by interviewers.

P1-512 HEALTH RELATED QUALITY OF LIFE ASSOCIATED WITH MAJOR DIETARY PATTERNS IN TUE SUN PROJECT

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Introduction The analysis of dietary patterns has become a valuable tool to examine diet-disease relations. However, little is known about the effects of dietary patterns on quality of life.

Objectives To ascertain the major dietary patterns in the SUN cohort and the association of the adherence to these dietary patterns with physical and mental health function.

Methods This analysis included 10 185 participants from the "Seguimiento Universidad de Navarra" (SUN) cohort. Dietary patterns were ascertained through a factor analysis based on 16 predefined food groups. Health related quality of life was measured after 4 years of follow-up with the Spanish version of SF-36 Health Survey. Generalised Linear Models were fitted to asses the mean scores and their 95% CIs (95% CI) of the 8 domains of the SF-36 according successive quintiles of adherence to the dietary patterns.

Results Two major dietary patterns were found. The "Western" dietary pattern (rich in fast food, high-fat dairy, red meats and processed pastries) and the "Mediterranean" pattern (characterised by fruits, vegetables, fish and olive oil). A high adherence to the Western pattern was associated with lower scores in vitality, general health and physical functioning with inverse dose response relationships ($p<0.05$). On the contrary, high adherence to the Mediterranean pattern was associated to higher scores in all of the physical domains, and in vitality and mental health with positive dose response relationships ($p<0.05$).

Conclusions Whereas the Western pattern seems to decrease vitality, the Mediterranean pattern increases vitality and physical wellness.