restricted to nurses below 30 years of age, odds ratio (OR) 3.4 (95% confidence interval [CI] 1.0–12.4). A similar increase in risk for experiencing spontaneous abortions throughout life was found among permanent night-shift workers, OR 4.4 (95% CI 1.2–16.3), also in this case for nurses below 30 years of age. No increased risk of spontaneous abortions was found among nurses above 30 years of age.

**Conclusions** The findings suggest that night work may cause spontaneous abortion by disrupting the circadian rhythms, but other unknown mechanisms may also play a role. More studies of night-shift workers considering different age groups are needed to supplement the findings.

### Abstracts

#### Session: Parallel session 2 RICOH: Child behavior and semen quality

**222 MALE REPRODUCTIVE TOXICITY OF PHTHALATES: A CROSS-SECTIONAL STUDY OF TESTOSTERONE AND TOTAL SPERM COUNT IN EUROPEAN AND INUIT POPULATIONS**

1 I O S Olmer Specht, 2Toft, 3Jönsson, 4Jens Peter. 1Copenhagen N, Denmark; 2Department of Occupational Medicine, Aarhus, Denmark; 3Department of Occupational and Environmental Medicine, Lund, Sweden; 4Department of Occupational and Environmental Medicine, Copenhagen N, Denmark

**Objectives** Phthalates are widely used man-made chemicals that in spite of a short half-life in the organism are detectable in urine among more than 95% of investigated men and women. Phthalates are with varying potency anti-androgens through interaction with several metabolic steps involved in endogenous sex-steroid metabolism. Some cross-sectional studies have shown inverse associations between phthalates and plasma testosterone levels of testosterome and some semen characteristics, but the evidence base is limited and results are conflicting. The aim of this study was to examine the hypothesis that phthalates are associated with reduced levels of plasma testosterone and total sperm counts.

**Methods** Spouses of pregnant women from Greenland (n = 196), Poland (n = 190) and Ukraine (n = 203) were enrolled into the study. We measured six metabolites of di-2-ethylhexyl phthalate (DEHP) and diisononyl phthalate (DINP) in serum and concurrent testosterone, sperm concentration, sperm volume and total sperm count. Analyses were stratified by country as well as analysed across countries.

**Results** The most abundant metabolite from DEHP namely 5-cx-MEPP (mean concentration in serum 2.22 ng/ml) was negatively associated with testosterone, sperm volume and total sperm count in the overall analysis after adjustment for country, age, sexual abstinence time and current smoking. Testosterone decreased with 1.08% pr ng/ml 5-cx-MEPP (p = 0.032), volume with 1.59% (p = 0.043) and total sperm count with 3.47% (p = 0.030). When analysed by country the association was strongest in Ukraine and Poland, but the inverse relationship between 5-cx-MEPP and outcomes was observed in all three countries. No significant association between phthalate metabolites and sperm concentration was observed.

**Conclusions** These results are compatible with a weak anti-androgenic action of the DEHP metabolite 5-cx-MEPP on testosterone and total sperm count. Whether this cross-sectional association reflects causal mechanisms remains to be established.

**223 MOTOR DEVELOPMENT FOLLOWING PRENATAL EXPOSURE TO P,P-DDE AND CB-153: A FOLLOW-UP STUDY OF INUIT AND EUROPEAN CHILDREN AGED 5–9 YEARS**

1B B H Høyer, 2Ramlau-Hansen, 3Pedersen, 4Bonde, 5Toft. 1Aarhus University Hospital, Aarhus C, Denmark; 2Aarhus University, Aarhus C, Denmark; 3Centre for Arctic Environmental Medicine, Nuuk, Greenland; 4Department of Occupational and Environmental Medicine, Bispebjerg Hospital, Copenhagen N, Denmark

**Objectives** Both PCB and DDE are lipophilic compounds which bio-accumulate in adipose tissue and cross the placental barrier. Prior studies of the association between prenatal exposure to