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TPS 623: Exposures to pesticides, Johan Friso Foyer, Floor 1, August 26, 2019, 3:00 PM - 4:30 PM

The effects of the pesticide during pregnancy have been investigated increasingly. Studies on environmental exposure to pyrethroids have adverse effects on pregnancy and infant pregnancy, including the immune system of birth size and neurological development. The realization of a birth cohort to investigate the effects of environmental pollution and children's health in the city of Rio de Janeiro (MRJ) - Brazil is a proposal of the Childhood and Environmental Pollution Project (PIPA), which included a study pilot (PS). This work aims at the profile of exposure to an animal pesticide in pregnant women resident in MRJ- Brazil. Methods: Cohort study with 10 months duration. Population composed of pregnant women and their children born in a maternity school. The study protocol included investigations in the third trimester of gestation at birth and continuing through the 6th month. Biological samples from the mother and baby were collected and clinical evaluations were performed in the children. For the collection of the social date, demographic, anthropometric, nutritional, health and reference programs we applied a questionnaire. A total of 142 pregnant women participated in the study. Results: The mean age of pregnant women was 27.5 years (SD 8.05), 78% had less than 11 years of schooling and an average percapita was \$ 242.83 (min \$ 8.53 - max \$ 1,616,28). The use of Spray insecticide was reported by 45.2% (61) of the pregnant women, 24 (16.9%) used more than 3x / week. The use of repellents was reported by 75 pregnant women (55.6%), the use of lice medicine by 6 pregnant women (5.1%) and the handling of pet products by 24 (20.7%). Conclusions: Knowing the exposure profile of the population can direct the actions and identify the associated risks, subsidizing public policies.

### Pesticides in indoor dust – A possible important route for residents' exposure

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Approximately 30% of Dutch homes are located within 250 meters of agricultural fields. Concerns have been raised about the exposures of residents from these homes to pesticides. A possible source of exposure being contamination of indoor dust. Due to the lack of information on levels in homes close to agricultural fields, pesticides were measured in dust from newly placed clean doormats (ddm) and vacuumed floor dust (vfd).

Homes located within 250 m from bulb fields were invited to participate in the study. Homes not having agricultural fields within 500 m were selected as controls. In total 96 homes (16 being controls) participated in the study. In all homes, dust was collected one week after a spraying event. Besides sampling during spraying season, we also sampled dust outside of the spraying season. For determination of pesticides in the dust, a multi-residue method was used based on quechers extraction and lc-ms/ms. a total of 46 pesticides were analyzed.

We evaluated concentrations in dust of pesticides that were applied on bulbs during and outside spraying seasons. In addition, we compared concentrations in dust from homes located within 250 m from bulb fields and control locations. We assessed correlations between vfd and ddm as these types of samples provide information regarding routes for

pesticide distribution in the environment that contribute to residents' exposure via dust (e.g. air and drag-in).

All of our samples have been collected, pesticide levels have been assessed, data analyzed and conclusions have been drawn. Results are currently embargoed but will be presented during the conference.

### Air Pollution and Health Benefits from Cleaner Vehicles and Increased Active Transport: A Health Impact Assessment Approach for Seattle, WA

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OPS 58: Predictors and impact of active travel, Room 210, Floor 2, August 28, 2019, 10:30 AM - 12:00 PM

Aim: Transportation sector interventions can influence public health through multiple pathways, including air pollution and physical activity. Health impact assessments can help describe these health benefits, but often lack quantification of key pathways. In this study, our goal was to quantify the health benefits of urban transportation policies promoting electric vehicle (EV) use and replacement of short car trips with walking and bicycling in Seattle, Washington.

Methods: We compared a business as usual scenario projected to 2035 with intervention scenarios in which 35% of gasoline vehicles were switched to EVs, 50% of car trips less than 1.5 miles were replaced by walking, and 50% of trips 1.5-5 miles were replaced by bicycling. To quantify changes in air pollution, we modeled primary traffic-generated PM<sub>2.5</sub> and NO<sub>x</sub> under each scenario at randomly selected residences in the Seattle area using the Mobile Vehicle Emission Simulator (MOVES) and the Research Line Source Dispersion Model (RLINE). Using data from a local travel survey, we simulated changes in weekly walking and bicycling activity resulting from eliminating short car trips. Then, we leveraged the published epidemiological literature to estimate the annual health benefits in terms of reduced mortality and DALYs from changes in air pollution and physical activity due to the transportation policies.

Results: We estimated that increasing EV use and active transport would result in 19 (95%CI: 7-31) fewer premature deaths and 390 (95%CI: 140-650) fewer DALYs per year by reducing NO<sub>x</sub> and PM<sub>2.5</sub> from traffic. We also estimated 91 (95%CI: 41-129) fewer premature deaths and 13,000 (95%CI: 5,200-19,000) fewer DALYs each year due to increased physical activity.

Conclusion: This study demonstrated that moving towards cleaner vehicles and active transport can help to improve air quality and reduce burden of disease. Most health benefits were the result of increased physical activity due to increased active transport.

### Cadmium exposure and breast cancer risk: a systematic review and dose-response meta-analysis of cohort studies

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PDS 63: Chemicals and metals: health effects, Exhibition Hall (PDS), Ground floor, August 27, 2019, 10:30 AM - 12:00 PM

**Background and aim:** Cadmium is a heavy metal which has been implicated in breast cancer etiology because of its toxic properties such as endocrine disruption. The general population is exposed to cadmium through dietary intake, cigarette smoking, emissions of motorized traffic and industrial facilities. We carried out a systematic review and dose-response meta-analysis of the cohort studies investigating the association between cadmium exposure and breast cancer risk, for which inconsistent results have been reported in the literature.

**Methods:** Following online database search up to January 2019, we carried out a dose-response meta-analysis to identify the relation between cadmium exposure and disease risk. We used a restricted cubic spline model and the 'one-stage' approach, stratifying for exposure assessment method and menopausal status.

**Results:** We identified 12 studies, 9 using breast cancer incidence and 3 mortality as an outcome. In six studies cadmium exposure was assessed through dietary questionnaires, in five through urinary excretion levels, and in one based on environmental air levels. Seven studies included post-menopausal women only. Overall, we observed a positive linear relation between breast cancer risk and dietary cadmium intake (relative risk (RR) 1.04, 95% confidence interval (CI) 0.81-1.33 at 10 µg/day, and RR 1.12, 95% CI 0.80-1.56 at 20 µg/day). On the converse, risk was not associated with urinary excretion. Analysis restricted to post-menopausal women showed a positive association between cadmium exposure assessed through either dietary intake or urinary excretion, for levels higher than 20 µg/day and 1.65 µg/g creatinine, respectively.

**Conclusions:** Our dose-response meta-analysis suggests that cadmium exposure may be positively and linearly associated with breast cancer risk. Results were, however, dependent on the method used to assess exposure. For post-menopausal women, the shape of the association suggests that a threshold of exposure may be needed to raise cancer risk.

### **Air pollution health risk perception among residents in Biancavilla: a national priority contaminated site**

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TPS 642: Environmental justice and impacts, Exhibition Hall, Ground floor, August 26, 2019, 3:00 PM - 4:30 PM

#### **Background/Aim**

Environmental risk perception is an important source of stress in exposed population. Limited evidence suggests an association between perceived and actual air quality and concern for health. The present survey estimated the air pollution health risk perception and the quality of life among residents in Biancavilla, a national priority contaminated site and compared it to urban and suburban areas in Sicily (south Italy).

#### **Methods**

A survey was conducted in the period December 2018 – February 2019. Participants answered a series of questions about demographic data, air pollution risk perception (passive smoking, air pollution from cars, industries, eruption, incinerator-landfill, indoor air pollution, asbestos/fluoro-edenite) and a list of 4 sources of information on health risks (TV and radio, newspaper/magazines, doctors, internet). EuroQoL questionnaire was used to evaluate quality of life. A Risk Perception Index was used to express the propensity of respondents to rate environmental health issue as high health risks. Responses for each hazard were allocated a numerical result, with 1=no risk, 2=low risk, 3=moderate risk, and 4 = high risk and a mean response value was calculated. Bivariate analysis was performed.

#### **Results**

The survey involved 121 (52.1% females) subjects, median age 38 years (IQR 25.5-63.3). Subjects recruited in the three areas investigated

had similar socio-demographic characteristics; they only differed in marital status (p=0.04). Urban residents showed significantly higher risk perception for industries air pollution than suburban and Biancavilla areas (p=0.027). Residents in Biancavilla expressed the maximum risk perception for fluoroedenite. Internet was the higher confidence source of information on health risks (mean 3.53, 95%CI 3.43-3.64). Self-reported quality of life was no different in each of the three areas.

#### **Conclusions**

The results of the present study offer the opportunity to investigate health risk perception and its determinants.

Understanding people's risk perception leads to better risk communication and policy implementation.

### **Residential proximity to dioxin-emitting facilities and risk of non-Hodgkin lymphoma in the NIH-AARP Diet and Health Study**

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TPS 761: Health effects of pollution sources and components, Johan Friso Foyer, Floor 1, August 28, 2019, 3:00 PM - 4:30 PM

**Background:** Polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/Fs) are persistent organic pollutants emitted from industrial combustion facilities and various manufacturing processes. Residential proximity to facilities emitting PCDD/Fs has been associated with increased PCDD/F levels in homes and risk of non-Hodgkin lymphoma (NHL), though few studies have investigated these relationships.

**Methods:** We evaluated associations between residential proximity to dioxin-emitting facilities and NHL among participants of the NIH-AARP Diet and Health Study, a prospective cohort (N=548,845) in 6 states and 2 cities in the U.S. We linked geocoded enrollment addresses (1995-1996) with a U.S. Environmental Protection Agency database of 4,478 historical PCDD/F sources, which contained toxic equivalency quotient (TEQ) emissions estimates from 1995. We evaluated NHL risk with proximity metrics indicating presence/absence of one or more facilities within 3 or 5-km of participant homes, overall and separately by facility type (e.g. coal-fired power plants, municipal solid waste incinerators). We also examined risk by exposure intensity within 5km using a distance- and toxicity-weighted average emissions index (AEI [ng TEQ/km<sup>2</sup>]). Cox regression was used to estimate associations (hazard ratio, HR; 95% confidence interval, 95%CI) with NHL and major subtypes, adjusting for demographic, lifestyle, and dietary characteristics.

**Results:** With 6,747 incident cases through 2011, we found no associations between overall or facility-specific PCDD/F proximity metrics and risk of NHL or major subtypes. However, participants with an AEI >95th percentile had significantly increased risk of developing NHL compared to unexposed participants (HR=1.27; 95%CI=1.05-1.53; p-trend=0.01). Risk of follicular lymphoma was also significantly elevated among participants with the highest quartile of the AEI (HR=1.33; 95%CI=1.02-1.74; p-trend=0.04). We saw no significant associations with other NHL subtypes.

**Conclusions:** Using exposure metrics that accounted for distance and the toxicity of emissions, we found evidence of an association between residential exposure to high PCDD/F and risk of NHL overall and follicular lymphoma in particular.

### **Folic acid intake, urinary creatinine, and arsenic concentrations in Canadian pregnant women**

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TPS 621: Exposure to metals, Johan Friso Foyer, Floor 1, August 26, 2019, 3:00 PM - 4:30 PM