

the production of bio-char from combustible healthcare waste and compare pyrolysis efficiency and calorific value of locally made pyrolysis equipment with commercial one.

**Methods:** Healthcare wastes were collected from different wards of the Jimma University Hospital for seven consecutive days in 2017. The wastes were segregated to separate the organic biomass, mixed, weighed, sterilized, dried, shredded, and samples taken for pyrolysis. Pyrolysis experiments were carried out on a fixed bed of reactor under atmospheric pressure at different temperatures of 300<sup>o</sup> and 400<sup>o</sup>C using both locally made and commercial pyrolysis equipment.

**Results:** About 65% of the general healthcare waste was found to be combustible. Higher temperature gave less char in all types of pyrolysis reaction. Volatile matters were observed to be nearly the same figures in all observations. The yield of the bio-char at 300<sup>o</sup>C for commercial pyrolysis and Local pyrolysis was 40.56 and 33.13 wt.% and was estimated to produce bio-char of heating value of 24.85 and 25.83 MJ/Kg respectively. There was less bio-char yield and calorific value in the bio-char produced by commercial pyrolysis at 400<sup>o</sup>C. Generally the calorific value of bio-char produced by both local and commercial pyrolysis fulfills FAO standards.

**Conclusions:** Combustible healthcare wastes have the potential to be a very effective feedstock for bio-char production. For energy efficiency, both local and commercial pyrolysis at 300<sup>o</sup> were recommended. Pyrolysis of healthcare waste in different proportion by mixing with municipal solid waste may need another investigation. Life cycle analysis shows that bio-char reduces greenhouse gas emission.

### **A National Study of Maternal and Paternal Occupational Exposure to Endocrine Disrupting Chemicals and Pregnancy Outcomes**

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TPS 742: Adverse birth outcomes 1, Exhibition Hall, Ground floor, August 27, 2019, 3:00 PM - 4:30 PM

**Background:**

Endocrine disrupting chemicals (EDC) are substances that can alter the endocrine system function. EDC may affect fetal growth and other pregnancy outcomes.

**Aim:**

This study aims to assess whether maternal and paternal occupational exposure to EDC are associated with pregnancy outcomes.

**Methods:**

This study was based on a national birth retrospective cohort registry of the entire Israeli population, 2000-2014. A total of 2,048,191 maternal and paternal job titles for singleton live births without congenital malformations, were coded according to SOC2000 and linked to a job exposure matrix that assessed occupational exposure to 10 EDC groups. Exposure to EDC was estimated for maternal and paternal job titles (628,350 and 595,824 births, respectively). Multiple linear and logistic regression were used to evaluate the associations between overall EDC exposure and specific EDC groups and pregnancy outcomes, adjusted for socio-demographic variables.

**Results:**

Maternal occupational exposure to EDC was associated with increased mean birth weight (13.07 gr, 95%CI: 8.47, 17.67), increased odds for macrosomia, large for gestational age newborns and reduced odds for low birth weight (LBW) and small for gestational age (SGA) newborns. The main exposure effects were due to exposure to metals.

Paternal occupational exposure to EDC was associated with decreased mean birth weight (-5.14 gr, 95%CI: -7.59, -2.70) and increased odds for SGA and preterm delivery. Paternal occupational exposure to polychlorinated organic compounds and brominated

flame retardants were associated with increased mean birth weight and reduced odds for LBW.

**Conclusion:**

The results of this national-scale study suggest that parental occupations classified as exposed to EDC are associated with adverse pregnancy outcomes. These associations differed between maternal and paternal exposures.

This study directs further research and provides a unique platform for future studies on occupational legislations that will protect newborns health and will improve public health.

### **Hemorrhagic fever with renal syndrome and climate variability in China**

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TPS 662: Climate change effects on labour, migration and infections, Exhibition Hall, Ground floor, August 28, 2019, 3:00 PM - 4:30 PM

**Background:** Hemorrhagic Fever with Renal Syndrome (HFRS) is a rodent-borne disease, known to be affected by environmental factors with approximately 10,000 cases reported each year across mainland China. There is, however, limited evidence about the relationship between climate factors and the incidence of HFRS in China, and globally.

**Objective:** We aimed to study the association between HFRS incidence and climate factors across China.

**Methods:** 132,549 HFRS cases during 2006-2016 and monthly weather data from over 800 meteorological monitoring stations were obtained across all China. The study assessed relationships separately for three climate zones where most cases occur. A symmetric bi-directional case-cross over design was employed. The hazard period was defined as six calendar months preceding the month when an incident HFRS case was diagnosed, and controls were selected by two referent exposure windows symmetric to the case exposure window one year before and one year after. Air temperature and precipitation were assessed in distributed lag models (Lag 0- month of the incident case up to Lag 6 - 6 months preceding the case). Climate-zone based conditional logistic regression models were then used to examine the effect of climate variables on the risk of HFRS.

**Results:** Estimated cumulative effect (Lag0-Lag6) of 1<sup>o</sup>C increase for HFRS incidence above thresholds showed strong association in the subtropical zone(OR-1.10, 95% CI 1.01-1.18) and precipitation above thresholds for the temperate zone, warm temperate zone showed positive association with HFRS incidence and negative effects for subtropical zone, respectively. Below the threshold estimated effects (decrease of 1<sup>o</sup>C) for temperature in the temperate zone, warm temperate zone and subtropical zone were OR-1.05 95% CI 1.04-1.07, OR-1.15, 95% CI 1.13-1.17; OR-0.94 95% CI 0.91-0.96, respectively.

**Conclusions:** Overall, air temperature and precipitation showed different relationships with HFRS incidence in different climate zones of China.

### **Estimating annual residential exposure averages by extrapolating snapshot PM2.5 campaign results and translating ambient measurements**

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