Introduction: Copper contamination is increasing and can be a threat to human health. This study tries to summarize copper levels measured in humans in Iran.

Methods: Persian databases such as SID, Magiran, IranMedex and English databases such as Scopus, Pubmed, Science Direct and the Google Scholar were searched using both English and Persian keywords. 28 articles that measured the concentration of copper in human samples in Iran were included.

Results: According to the results of the reviewed studies, copper levels in some Iranian populations was higher than normal levels. These populations included pregnant women with preeclampsia, patients with oral cancer, patients with Giardiasis infection, Parkinson's patients, children under the age of 12 years with β-thalassemia major, pregnant women in the third trimester, type 2 diabetic patients. Copper levels were less than normal, in patients with tuberculosis after treatment and post-menopausal women with osteopenia and osteoporosis. Also, Copper concentrations in patients with with tuberculosis, cutaneous leishmaniasis, brucellosis and Molybdenum unit workers was higher; and copper concentrations in patients with Pemphigus Vulgaris and coronary artery disease was less than their controls, but all were in the normal range (70-140 μg/dl). The amount of copper adsorption in different teeth is different.

Conclusion: High levels of copper have been reported in some Iranian populations and this can be a threat to human health. Monitoring copper levels in some Iranian populations is necessary.

Attributable Risk of Mortality associated with Heat and Heat waves: A time-series study in Kerman, Iran during 2005-2017
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OPS 13: Heat, cold and mortality, Room 117, Floor 1, August 26, 2019, 1:30 PM - 3:00 PM

Background: The association between heat or heat waves and mortality should often be reported in a way that makes it sensible by health policymakers. In this study we aimed to assess the effect of heat and heat waves on mortality using attributable risks.

Methods: Nine Heat Waves (HW) were defined using a combination of severity and duration of mean daily temperature. Heat wave effects were assessed using adjusted and main effects. Adjusted effects were assessed as a binary variable and main effects were assessed by comparing the median temperature (in heat wave days) to Minimum Mortality Temperature (MMT). The effects of heat, mild heat and extreme heat on mortality were also assessed. Distributed Lag Non-linear Models were used to assess the relations in a bi-dimensional perspective in which the quadratic b-spline was chosen as the basis function for the dimension of the exposure and the natural cubic b-spline was chosen for lag dimension. The backward perspective was used to estimate the attributable risks.

Results: The total mortality attributed to non-optimal temperatures for all days was 1.91% (CI 95%: -6.36, 8.47). The Attributable Risks (AR) were 2.23%, 2.02% and 0.25% for heat, mild heat and extreme heat days, respectively. AR was more for females and the above 65 years old groups than other groups in heat, mild heat and extreme heat days. While the stronger heat waves defined based on temperature above the 95 and 98th percentile had a significant attributable risk for total mortality in the added effects; the weaker heat waves (defined based on temperature above of the 90th percentile (HW1, HW2, HW3) had higher attributable risks, significant for HW1 and HW2 in the main effects.

Conclusion: Apparently weaker heat waves show more immediate effects, while stronger heat waves increase mortality over several days.

Air pollution and cardiovascular death in Tehran, Iran
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TPS 681: Short-term health effects of air pollutants 1, Exhibition Hall, Ground floor, August 26, 2019, 3:00 PM - 4:30 PM

Background: There is evidence that shows exposure to air pollution can be related to cardiovascular deaths. This study aimed to estimate the effect of ambient air pollutants on cardiovascular deaths in Tehran, Iran; which is one of the most polluted cities in the world.

Methods: In this ecological study, air pollutant data was inquired from the air quality control units of municipalities and the Tehran Province Environmental Protection Agency. Meteorological data was enquired from the meteorological organization, and death data was inquired from the Tehran’s cemetery registration (Behesht-e-Zahra). Generalized Additive Models (GAM) were used for data analysis and Incidence Rate Ratios with different lags were calculated for up to 30 days.

Results: During 2005 until 2014, 21537 cardiovascular deaths happen in Tehran in which 122911 (57.07%) were male. NO2 and PM10 were associated with total cardiovascular deaths. The strongest relationship between NO2 and respiratory death was seen after 4 day lags (RR= 1.00106, 95% CI: 1.00073-1.00140), and for PM10 was seen on the same day (lag 0) (RR= 1.00053, 95% CI: 1.00030-1.00076).

Conclusion: The result of this study showed that PM10, and NO2 are probably responsible for part of the cardiovascular deaths that happen daily in Tehran. There should be more efforts to control air pollution in Tehran.

Organophosphate Exposures, Financial Hardship and Child Neurodevelopmental Outcomes in the CHARGE study
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OPS 55: Pesticides and neurological outcomes, Room 412, Floor 4, August 26, 2019, 1:30 PM - 3:00 PM

In-utero exposure to organophosphate pesticides has been associated with neurodevelopmental delay. This study examined whether maternal report of inability to pay for basic needs (food, housing, medical care and heating) modified the relationship between prenatal pesticide exposure and autism spectrum disorder (ASD).

Methods: We studied 488 children with ASD and 329 typically-developing controls aged 2-5 years enrolled between 2003 and 2008 in the CHARGE (Childhood Autism Risks from Genetics and the Environment) study, a population-based, case-control investigation. Diagnoses were confirmed by standardized assessments and information regarding maternal factors was determined from a structured interview with the mother. Residential proximity to agricultural application of organophosphate pesticides, based on California Department of Pesticide Regulation data, was determined by spatial analysis of maternal residence before and during pregnancy. Multiple logistic regression was used to examine the association between exposure during several time points during the pregnancy, and effect modification by the experience of financial hardship.

Results: 213 (26%) CHARGE study mothers lived within 1.5 km of agricultural application of organophosphate compounds during their pregnancies. ASD odds were elevated in those exposed to pesticides between the 3 months prior to conception up through delivery (adjusted odds ratio (aOR) 2.44; 95% CI [1.05, 5.63]). Odds for mothers with 2nd trimester organophosphate exposure was higher for women with financial hardship compared to those without, 3.01; 95% CI [1.34, 6.75] vs 1.92; 95% CI [1.35, 2.76], respectively. This disparity was