

METALS EXPOSURE IN PREGNANT WOMEN IN WESTERN AUSTRALIA

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Background and Aims: The Australian Maternal Exposure to Toxic Substances (AMETS) study was initiated to measure the exposure of pregnant women in Western Australia to a range of persistent toxic substances in the environment. Sample collection for this study is continuing until April 2011, however preliminary results for metals in blood and urine are now available.

Methods: Pregnant women from across Western Australia have been recruited via local hospitals and the community. To date 157 women have provided blood and urine samples for the study, of which 80 blood and 120 urine samples have been analysed for metals. Participants have also completed a questionnaire and diet diary and provided samples of their household drinking water, soil and dust.

Results: Metals concentrations were low in biological samples with the exception of cadmium and uranium which were elevated with respect to the international literature (B-Cd mean 0.90µg/L, range 0.12-2.77µg/L; B-U mean 0.08µg/L, range <0.01-0.22µg/L; U-Cd mean 0.92µg/L, range 0.2-2.8µg/L; U-U mean 0.01µg/L, range <0.01-0.17µg/L). Copper concentrations were variable (B-Cu mean 1447µg/L, range 0.27-2410µg/L; U-Cu 11.8µg/L, range 1.4-55.3µg/L). Thirty percent of participants (aged 19-44 years), had urine cadmium concentrations of >1µg/L and almost 50% of participants had creatinine adjusted concentrations of >1µg/g (median 0.29µg/g, range 0.29-4.65µg/g). Concentrations of metals in soil, dust and drinking water samples were generally low.

Conclusions: Elevated biological cadmium and uranium concentrations were found in pregnant women in Western Australia. These concentrations were at levels which have the potential to increase the risks of health effects, such as decrements in bone density, in the women in later life. Environmental concentrations appeared to explain little of the variance in biological concentrations, as did the other variables collected. These results for Australia confirm those conducted in other locations where diet is the likely main source of metals exposure.