# DRINKING WATER CONTAMINATED WITH PERFLUORINATED CHEMICALS – THE USE OF MODELLED AND MEASURED SERUM CONCENTRATIONS IN EPIDEMIOLOGICAL ANALYSES.

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**Background and Aims**: The C8 Science Panel Community study in the Mid Ohio Valley comprises a number of inter-linked epidemiology studies on various outcomes, including cancer, in relation to PFOA exposure in contaminated drinking water. PFOA exposure is available as (1) measured serum levels and (2) annual modelled serum levels using fate/transport and pharmacokinetic models. The aim of this presentation is to explore the application of different exposure classification strategies, using a study of the prevalence of cancer to illustrate the issues.
**Methods**: Questionnaire data on cancer diagnosed in the ten years prior to the survey of 2005-6, covariate information on smoking, SES etc, and measurement of serum PFOA were available for 49,082 adults who had spent at least 12 months in one of 6 water districts contaminated with PFOA. To assess stability of ranking of individual serum levels over time, we compared serum PFOA in 2005/6 and 2010 in a nested sample of 755 participants. We use random effects logistic regression models to calculate the odds of the cancers in relation to both individual and water district area averages of serum levels, using the two measures of exposure.
**Results**: Among cancers diagnosed between 1996 and 2006 there were: prostate 259, breast 231, colon 125. Correlation of PFOA measured in 2005/6 to 2010 was very high (r=.79). Analyses are currently underway and results will be presented of confounder adjusted prevalence using different PFOA exposure metrics.
**Conclusions**: For epidemiological analyses, measured serum levels reflect individual differences both in exposure and in accumulation/excretion rates; modelled exposures track historical patterns of exposure, but with limited individual information on intake and none on accumulation/excretion rates; marked geographical clustering of exposure offer challenges and opportunities for confounder control. Serum levels correlate highly between 2005 and 2010 measurements partly due to the long serum half-life.