

# Publication

A prospective cohort study of school-going children investigating reproductive and neurobehavioral health effects due to environmental pesticide exposure in the Western Cape, South Africa : study protocol

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Research on reproductive health effects on children from low-level, long-term exposure to pesticides currently used in the agricultural industry is limited and those on neurobehavioral effects have produced conflicting evidence. We aim at investigating the association between pesticide exposure on the reproductive health and neurobehavior of children in South Africa, by including potential relevant co-exposures from the use of electronic media and maternal alcohol consumption.; The design entails a prospective cohort study with a follow-up duration of 2 years starting in 2017, including 1000 school going children between the ages of 9 to 16 ayears old. Children are enrolled with equal distribution in sex and residence on farms and non-farms in three different agricultural areas (mainly apple, table grapes and wheat farming systems) in the Western Cape, South Africa. The neurobehavior primary health outcome of cognitive functioning was measured through the iPad-based CAmbridge Neuropsychological Test Automated Battery (CANTAB) including domains for attention, memory, and processing speed. The reproductive health outcomes include testicular size in boys and breast size in girls assessed in a physical examination, and blood samples to detect hormone levels and anthropometric measurements. Information on pesticide exposure, co-exposures and relevant confounders are obtained through structured questionnaire interviews with the children and their guardians. Environmental occurrence of pesticides will be determined while using a structured interview with farm owners and review of spraying records and collection of passive water and air samples in all three areas. Pesticide metabolites will be analysed in urine and hair samples collected from the study subjects every 4 months starting at baseline.; The inclusion of three different agricultural areas will yield a wide range of pesticide exposure situations. The prospective longitudinal design is a further strength of this study to evaluate the reproductive and neurobehavioural effects of different pesticides on children. This research will inform relevant policies and regulatory bodies to improve the health, safety and learning environments for children and families in agricultural settings.

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