

# MATERNAL RESIDENCE NEAR AGRICULTURAL PESTICIDE APPLICATIONS AND AUTISM: A FOLLOW-UP STUDY

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**Background and Aims:** Our previous work documented associations between maternal residence near organochlorine pesticide applications during the approximate period of brain embryogenesis (gestational days 21 through 49) and mid-infancy (months 4 through 6 of life) with the development of autism spectrum disorders (ASD). We sought to confirm these findings using a larger sample, to examine differences in associations for male and female children, and to consider other pesticides having toxicological mechanisms theorized as being relevant to autism in the literature.

**Methods:** We identified 2,553 males and 523 females with ASD born during 1996-2005 in California's Central Valley using the California Department of Developmental Services (DDS) electronic files. These were matched them by sex and maternal date of last menstrual period to 46,140 live-born, normal birthweight, term infants as a comparison group. We determined proximity (residence recorded at delivery within 500 meters) to applications of organochlorine, organophosphate, pyrethroid, and anilide pesticides using California Department of Pesticide Regulation records refined via Department of Water Resources land use polygons. Probability of ASD was analyzed using conditional logistic regression controlling for maternal age, educational attainment, race/ethnicity, and DDS Regional Center responsible for ASD classification.

**Results:** Proximity to organochlorine applications during brain embryogenesis was associated with ASD for males (OR for ten-pound increase 4.81 [95%-confidence interval 2.41-9.54]) but not for females (0.90 [0.29-2.84]). For applications occurring during mid-infancy, these ratios were 1.76 (1.37-2.26) and 1.18 (0.53-2.67), respectively.

**Conclusions:** Proximity to organochlorine pesticides during each time-period of interest was associated with ASD in a linear fashion among males but not females. We conduct further analysis to understand (a) the sensitivity of these findings to chosen definitions of time period for each pesticide class, and (b) the potential for spatial confounding.