

Reproductive outcomes in agricultural workers, laboratory technicians, hairdressers and shift workers

A study based on the Danish National Birth Cohort

Jin Liang Zhu

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Official Opponents: Jens Peter Bonde, Helena Taskinen, and Bernard Jeune.

Tutors: Jørn Olsen and Niels Henrik Hjollund.

Correspondence: Jin Liang Zhu, The Danish Epidemiology Science Centre, University of Aarhus, Vennelyst Boulevard 6, 8000 Aarhus C, Denmark. E-mail: zjl@soci.au.dk

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ABSTRACT

This PhD study was carried out at the Danish Epidemiology Science Centre, University of Aarhus. It consists of seven articles.

Exposure to pesticides, organic solvents, radioisotopes, dyes, and shift work during pregnancy may relate to adverse reproductive outcomes. The Danish National Birth Cohort (DNBC) was used to investigate reproductive outcomes in agricultural workers, laboratory technicians, hairdressers, and shift workers.

The first of the four computer-assisted telephone interviews for the DNBC was used to identify the exposed and the reference (unexposed) cohorts: 226 gardeners and 214 farmers vs 62,164 other workers, 1025 laboratory technicians vs 8037 teachers, 550 hairdressers vs 3216 shop assistants, and 8075 shift workers vs 33,694 daytime workers. The reproductive outcomes included time to pregnancy (reported in the first interview), fetal loss, preterm birth, postterm birth, small-for-gestational-age, congenital malformations, and developmental milestones (reported in the fourth interview). Data on pregnancy outcomes were obtained by linkage to the National Hospital Register. Cox regression was applied to analyze time to pregnancy, fetal loss, and congenital malformation. Logistic regression was used to analyze other outcomes.

No significant differences were observed in the reproductive outcomes under study between gardeners or farmers and all other workers, between laboratory technicians and teachers, between hairdressers and shop assistants, or between rotating shift workers and daytime workers. However, working with radioimmunoassay, radio-labelling, or organic solvent in laboratories was associated with an increased risk for preterm birth and for major malformations. Fixed night work was associated with an increased risk for later fetal loss and for postterm birth.

The results of the study do not indicate that gardening or farming, laboratory work in general, work in hairdressing salon, and rotating shift work during pregnancy have a high risk of fetal impairment. However, exposure to radioisotopes or organic solvents in the laboratory may impair fetal development, and fixed night work may impair fetal development perhaps by interrupting circadian rhythms. The findings on exposure to radioisotopes or fixed night work can be retested using data from national registers with information on occupation, or birth cohorts around the world. Occupational reproductive hazards beyond this thesis, as well as the possible interaction of the susceptibility genes with environmental agents, can be examined using data from the DNBC.