



**Australian Government**  
**Department of Veterans' Affairs**

## **Literature review of effects of fuel and solvent exposure on human female reproductive outcomes**

### **Lay summary**

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Royal Australian Air Force (RAAF) personnel, including female personnel, may be exposed to aviation fuel (jet fuel) and a range of solvents. At the request of the Department of Veterans' Affairs (DVA), researchers at Monash University conducted a literature review of the scientific evidence regarding whether occupational exposures to jet fuels and specified solvents of most relevance to the military were associated with risks to the reproductive health of women.

The literature examined was restricted to human studies and was based on scientific literature published in English during the search period (1 January 2000 - May 2017). The key outcomes assessed were the relationships between exposure to jet fuels and/or ten specified solvents and the risks of adverse reproductive health in women including infertility, poor pregnancy outcomes, Premature Ovarian Failure (POF) and early onset menopause.

For jet fuels, 11 eligible reports were identified. Of these, four were scientific peer review research publications, one was an unpublished report of a study, and six were publicly available government agency or independent medical scientific advisory committee reports, toxicological profiles or risk assessments.

One study reported hormonal changes in women exposed to jet fuel suggesting that exposure may impact on fertility, but the authors concluded the findings were not definitive and indicated that further research was needed. A further study finding was that jet fuel exposure was not linked with menstrual disorders. Although investigated, there was no evidence that exposure to jet fuel at the time of conception or in early pregnancy was linked with adverse pregnancy outcomes. In particular, exposure to jet fuels was not linked with risks of birth defects, preterm birth, or small for gestational age babies

For the specified solvents, 27 records met the inclusion criteria. Of these, 13 were scientific peer review research publications, two were peer review publications summarising or

updating the findings of reports, and the other 12 were reports. There was no consistent pattern in associations between any of the ten specified solvents and menstrual disturbances, infertility and adverse birth outcomes, but evidence was also limited due to the small number of studies on each exposure and each reproductive health outcome.

Overall, limitations of the small number of studies included the small numbers of cases for adverse reproductive health outcomes, limitations in exposure assessment or in health outcome assessment such as in self-reported outcomes, recall bias, and co-exposures with other chemical(s) or solvent(s) or fuel exposures at the workplace which made it difficult to attribute any observed effect to the specified jet fuel or solvent. Only three of the epidemiological studies identified had been conducted in female military populations. There were no studies identified that considered POF or early onset menopause, and only one study which investigated the association of one of the specified solvents with fertility.

The available literature on associations of exposure to jet fuels or the specified solvents with adverse reproductive health outcomes is very limited in its extent and in its applicability to women in the Australian military; there was no consistent pattern in associations, and overall the body of evidence could not be described as definitive.