**Uses:** residual carbamate insecticide; uses include indoor residual spraying, bed nets for mosquito control.

**Bans:** EU

**Residues:** in cord blood, newborn’s meconium, breast milk;¹ children’s hair;² house dust;³ food.

**Acute toxicity:** moderately toxic, neurotoxin. Symptoms include malaise, muscle weakness, dizziness, sweating, nausea, headaches, abdominal pain, diarrhoea, acute pancreatitis; seizures, coma, cardio-respiratory depression, death. Children have been poisoned in Nicaragua.¹ Poisonings from use, suicides, contaminated food (Thailand),³ deaths from suicides and accidental inhalation of aerosol.⁴

**Neurological:** prenatal exposure associated with poorer motor development in children.⁵ In rats, behavioural changes,⁶ impaired cognitive function⁷ and memory.⁸

**Cancer:** US EPA probable human carcinogen because of rat bladder tumours.⁹

**Genotoxicity:** mutagenic and genotoxic,¹² including in human cells.¹³¹⁴

**Endocrine disruption:** oestrogenic causing breast cancer cells to grow.¹²

**Reproduction:** ovarian haemorrhage (rats EPA).⁹

**Immune:** suppresses immune system.¹⁵

**Environmental effects:** Aquatic: high acute and chronic aquatic toxicity.¹⁶

**Terrestrial:** highly toxic to birds, moderately toxic to bees, beneficial insects.¹⁶

**Environmental fate:** Moderately persistent in soil and water, and may leach to groundwater.¹⁶ found in surface waters,⁹ wellwater.¹⁷

**Hazard to children:** childhood leukaemia;¹⁰¹¹ developmental neurotoxin, endocrine disruption, immune suppression, acute poisoning; later in life risk of breast and other cancers

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References:


