

Gulf War syndrome and soldier complaints

Main article: Gulf War syndrome

Increased rates of **immune system** disorders and other wide-ranging symptoms, including chronic pain, fatigue and memory loss, have been reported in over one quarter of combat veterans of the 1991 **Gulf War**.^[93] Combustion products from depleted uranium munitions are being considered as one of the potential causes by the Research Advisory Committee on Gulf War Veterans' Illnesses, as DU was used in 30 mm and smaller caliber machine-gun bullets on a large scale for the first time in the Gulf War. Veterans of the conflicts in the **Persian Gulf**, Bosnia and Kosovo have been found to have up to 14 times the usual level of chromosome abnormalities in their genes.^{[94][95]} Serum-soluble genotoxic teratogens produce **congenital disorders**, and in white blood cells causes immune system damage.^[96]

Human epidemiological evidence is consistent with increased risk of birth defects in the offspring of persons exposed to DU.^[10] A 2001 study of 15,000 February 1991 U.S. Gulf War combat veterans and 15,000 control veterans found that the Gulf War veterans were 1.8 (fathers) to 2.8 (mothers) times more likely to have children with birth defects.^[97] After examination of children's medical records two years later, the birth defect rate increased by more than 20%:

"Dr. Kang found that male Gulf War veterans reported having infants with likely birth defects at twice the rate of non-veterans. Furthermore, female Gulf War veterans were almost three times more likely to report children with birth defects than their non-Gulf counterparts. The numbers changed somewhat with medical records verification. However, Dr. Kang and his colleagues concluded that the risk of birth defects in children of deployed male veterans still was about 2.2 times that of non-deployed veterans."^[98]

In early 2004, the UK Pensions Appeal Tribunal Service attributed birth defect claims from a February 1991 Gulf War combat veteran to depleted uranium poisoning.^{[99][100]} Children of British soldiers who fought in wars in which depleted uranium ammunition was used are at greater risk of suffering genetic diseases such as **congenital malformations**, commonly called "birth defects," passed on by their fathers. In a study of U.K. troops, "Overall, the risk of any malformation among pregnancies reported by men was 50% higher in Gulf War Veterans (GWV) compared with Non-GWVs."^[101]

The U.S. Army has commissioned ongoing research into potential risks of depleted uranium and other projectile weapon materials like tungsten, which the U.S. Navy has used in place of DU since 1993. Studies by the U.S. Armed Forces Radiobiology Research Institute conclude that moderate exposures to either depleted uranium or uranium present a significant **toxicological** threat.^[102]

One particular subgroup of veterans which may be at higher risk comprises those who have internally retained fragments of DU from shrapnel wounds. A laboratory study on rats produced by the Armed Forces Radiobiology Research Institute showed that, after a study period of 6 months, rats treated with depleted uranium coming from implanted pellets, comparable to the

average levels in the urine of [Desert Storm](#) veterans with retained DU fragments, had developed a significant tendency to lose weight with respect to the control group.^[103]

Substantial amounts of uranium were accumulating in their [brains](#) and [central nervous systems](#), and showed a significant reduction of [neuronal](#) activity in the [hippocampus](#) in response to external stimuli. The conclusions of the study show that brain damage from chronic uranium intoxication is possible at lower doses than previously thought. Results from computer-based neurocognitive tests performed in 1997 showed an association between uranium in the urine and "problematic performance on automated tests assessing performance efficiency and accuracy."^[104]

In 2003 Professor Brian Spratt FRS, chairman of the [Royal Society's](#) working group on depleted uranium, said: "The question of who carries out the initial monitoring and clean-up is a political rather than scientific question," and "[the coalition](#) needs to acknowledge that depleted uranium is a potential hazard and make in-roads into tackling it by being open about where and how much depleted uranium has been deployed."^[34]

[edit][Iraqi population](#)

Since 2001, medical personnel at the [Basra](#) hospital in southern Iraq have reported a sharp increase in the incidence of child leukemia and genetic malformation among babies born in the decade following the Gulf War. Iraqi doctors attributed these malformations to possible long-term effects of DU, an opinion which was echoed by several newspapers.^{[76][105][106][107]} In 2004, Iraq had the highest mortality rate due to [leukemia](#) of any country.^[108] The [International Coalition to Ban Uranium Weapons](#) (ICBUW) has made a call to support an epidemiological study in the Basra region, as asked for by Iraqi doctors,^[109] but no peer-reviewed study has yet been undertaken in Basra.

A medical survey, "[Cancer, Infant Mortality and Birth Sex Ratio in Fallujah, Iraq 2005-2009](#)" published in July 2010, states that the "Increase in cancer and [birth defects](#) are alarmingly high" and that infant mortality 2009/2010 has reached 13.6%. The group compares the dramatic increase, five years after the actual war 2004, or exposure, with the [lymphoma](#) Italian peacekeepers^[110] developed after the [Balkan wars](#), and the increased cancer risk in certain parts of [Sweden](#) due to the [Chernobyl](#) fallout. The origin and time of introduction of the [carcinogenic agent](#) causing the [genetic stress](#), the group will address in a separate report.^[111]

[edit][1999 NATO bombing of Yugoslavia](#)



Sites in [Kosovo](#) and southern Central [Serbia](#) where NATO aviation used depleted uranium during the 1999 [Kosovo War](#).

In 2001, doctors at the Serb-run hospital in [Kosovska Mitrovica](#) say the number of patients suffering from malignant diseases has increased by 200% since 1998.^[112] In the same year, the [World Health Organization](#) reported that data from [Kosovo](#) was inconclusive and called for further studies.^[113]

A 2003 study by the [United Nations Environment Programme](#) (UNEP) in [Bosnia and Herzegovina](#) stated that low levels of contaminate were found in drinking water and air particulate at DU penetrator impact points. The levels were stated as not a cause for alarm. Yet, [Pekka Haavisto](#), chairman of the UNEP DU projects stated, "The findings of this study stress again the importance of appropriate clean-up and civil protection measures in a post-conflict situation."^[114]

^[edit]**Contamination as a result of the Afghan War**

The Canadian Uranium Medical Research Centre obtained urine samples from bombed civilian areas in [Jalalabad](#) that showed concentrations of 80-400 ng/L of undepleted uranium, far higher than the typical concentration in the British population of ~5 ng/L