

Agent Orange still linked to hormone imbalances in babies in Vietnam, study suggests

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Could herbicides that were sprayed during the Vietnam War still be causing health problems?

Exposure to Agent Orange sprayed during the Vietnam War has been linked to increased levels of certain hormones in women and their breastfeeding children decades later, potentially putting them at higher risk of health problems, according to a new study in *Science of the Total Environment*.

Previous research has shown a link between exposure to herbicides that contain chemicals called dioxins—such as Agent Orange—and prostate cancer in men. The new study, by researchers at Kanazawa University in Japan, reveals for the first time the impact of [dioxin exposure](#) on women and babies.

"Dioxin hotspots in the South of Vietnam are of the most severely polluted regions in the world," said Prof. Teruhiko Kido, lead author of the study from Kanazawa University, Japan. "We know exposure to dioxins has an impact on our hormone levels, and we wanted to know if this was being passed through generations and potentially putting babies at risk in these areas."

Agent Orange is one of the dioxin-contaminated herbicides that were sprayed during the Vietnam War and used in different industrial and

agricultural activities. Their use has resulted in hotspots of dioxin contamination, with concentrations of the chemical two to five-fold higher in affected areas in southern Vietnam than in non-contaminated regions.

Dioxins are endocrine-disrupting chemicals (EDCs)—they interfere with how hormones send messages to each other around the body. EDCs have been implicated in causing birth defects, cancer and neurodevelopment disorders. In particular, dioxins have an effect on a hormone called Dehydroepiandrosterone (DHEA), which is responsible for male and female characteristics in humans. Dioxins put these out of balance, leading to [health problems](#) and disfigurement.

"Decades of industrial development and chemicals released during the Vietnam War have led to high levels of dioxins in the soil and atmosphere and people are absorbing these chemicals from the food they eat and the air they breathe," said Prof. Teruhiko Kido. "We know dioxins have an impact on our hormones, so we wanted to see whether they were being passed from mother to baby."

In the new study, the team assessed 104 women with their newborn babies from two carefully selected locations. They chose a region in northern Vietnam, which was not occupied by the United States Air Force, and Bien Hoa, an industrial city where the Americans stored approximately 50 percent of Agent Orange and where there were at least four leaks in 1969-1970. Despite the natural elimination of dioxins in the past five decades, environmental and human samples around this area still contain high levels of the chemical.

The scientists analyzed the level of dioxin in the mothers' breast milk, and tested non-invasive samples of saliva from the babies for levels of the hormone DHEA. The results showed a nearly three-fold increase in DHEA in [babies](#) from the dioxin hotspot compared to non-contaminated

regions. This was linked to dioxins being transferred from mother to baby through their umbilical blood and breast milk.

"Our study confirms how sensitive and vulnerable children are to the environmental toxins their parents and even earlier generations have been exposed to," said Prof. Kido. "There is a lot we still don't know about what this means for children's health and what the long term impact could be, but studying people in these dioxin hotspots gives researchers the chance to understand the implications better."

Prof. Kido and the team plan to follow the children in the study up to the age of 10 to assess more accurately the endocrine impact of [dioxin](#) exposure during pregnancy and early life.

More information: Le Thai Anh et al. A relationship in adrenal androgen levels between mothers and their children from a dioxin-exposed region in Vietnam, *Science of The Total Environment* (2017). [DOI: 10.1016/j.scitotenv.2017.06.264](https://doi.org/10.1016/j.scitotenv.2017.06.264)

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