

Wahlang, B., Gao, H., Rai, S. N., Keith, R. J., McClain, C. J., Srivastava, S., & Cave, M. C. (2023). Associations between residential volatile organic compound exposures and liver injury markers: The role of biological sex and race. *Environmental Research*, 221, 115228. <https://doi.org/10.1016/j.envres.2023.115228>

## **Definitions**

- **Volatile Organic Compounds (VOCs):** Harmful chemicals that easily become gases. They come from things like car exhaust, factories, and cigarette smoke.
- **Liver Injury Markers:** Substances in the blood that indicate damage to the liver, such as certain enzymes and bilirubin.
- **Biological Sex:** The physical characteristics (male or female) that people are born with.
- **Race:** A group of people identified by their shared physical or social qualities.

## **Key Findings**

- Exposure to VOCs is linked to liver damage, with differences based on sex and race.
- Female and White individuals show more positive associations between VOCs and liver injury markers.
- Male smokers show negative associations between VOCs and liver injury markers.

## **Introduction**

This study looks at how exposure to volatile organic compounds (VOCs) at home affects liver health. Researchers want to see if these effects differ based on sex and race.

## **Main Content**

### **Background**

VOCs are harmful chemicals found in the air from various sources like car exhaust, industrial activities, and cigarette smoke. These chemicals can cause health problems, including liver damage.

### **Objectives**

The study aims to find out how sex and race affect the relationship between VOC exposure and liver injury markers.

### **Methods**

Researchers collected urine and blood samples from 663 participants. They measured 16 VOC metabolites in the urine and several liver injury markers in the blood. They also collected information on participants' sex, race, smoking habits, and other factors.

### **Results**

- **Sex Differences:** In females, higher levels of VOC metabolites were linked to increased levels of liver injury markers, such as alkaline phosphatase (ALP). In men, these associations were mostly negative.
- **Race Differences:** White participants showed more positive associations between VOC metabolites and liver injury markers compared to Black participants.
- **Smoking Status:** Positive associations between VOC metabolites and liver injury markers were found in female smokers but not in male smokers.

## **Conclusion**

The study shows that exposure to VOCs is linked to liver damage, with different effects based on sex and race. Female and White individuals are more affected by VOC exposure in terms of liver injury markers. These findings highlight the importance of considering sex and race when assessing the health impacts of air pollution. Further research is needed to better understand these differences and to develop strategies to protect vulnerable populations from VOC exposure.

Word Count: 376