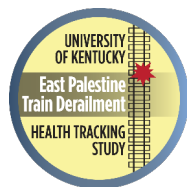




## **College of Public Health**

Department of Epidemiology and Environmental Health



# **East Palestine Health Tracking Study**

## **Serum Dioxin Pilot Study**

### **Purpose of the study**

Measure dioxin levels in the blood (serum) of East Palestine residents and compare with levels typically found in the United States.

### **What did the study involve?**

Twenty East Palestine Health Tracking Study participants were invited to participate. Eighteen enrolled and provided enough blood for analyses on July 17 and 18, 2023. Samples were analyzed by the Centers for Disease Control and Prevention (CDC), National Center for Environmental Health, Division of Laboratory Sciences, Organic Analytical Toxicology Branch.

### **What are dioxins?**

Dioxins are a group of chemicals including polychlorinated dibenzo-p-dioxins and furans (PCDD/F) and coplanar polychlorinated biphenyls (cPCBs). Dioxins and furans were chemicals of concern following the train derailment and subsequent rail car burn. They form when burning occurs (forest fires or household trash) or during chemical reactions. PCBs are man-made products which were banned in 1979 and are not thought to be associated with the derailment, but because these PCBs are similar to dioxins and

furans, the blood test also includes them. All of these chemicals can enter the food chain and accumulate in the human body. Thus, older adults typically have higher levels in their bodies than younger adults and children.

## **How are people exposed to dioxins?**

People can be exposed to dioxins by eating high-fat foods such as milk products, eggs, meat, and some fish. All Americans have some dioxin in their body from these sources.

## **How was the TEQ calculated?**

There are 20 dioxin and dioxin-like chemicals that can be analyzed. The concentration of all dioxins measured in serum is commonly given as a Toxic Equivalent (TEQ) value. The TEQ is measured by picograms per gram of serum lipid (pg/g lipid). A picogram is one-trillionth of a gram, which is very, very, very small. This amount can be compared to one teaspoon of a chemical in the combined water of 1,000 Olympic sized swimming pools. The TEQ represents the biological activity of the dioxins. The TEQs are calculated by multiplying the value of each chemical measured in serum by a factor related to how toxic that chemical is and then summing the resulting value for each chemical.

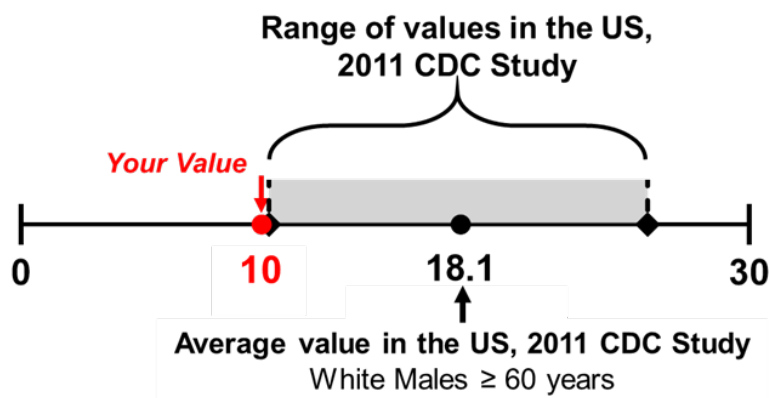
## **How did East Palestine pilot study participants compare to U.S. average values?**

Each participant's value was **below or within the range** of levels found in a 2011 CDC study in the U.S. for their specific age range, race, ethnicity, and sex. Thus, although dioxins may have formed during the derailment and burning of chemicals in the railcars, the level of dioxin experienced by our participants was not high enough to increase the serum dioxin level beyond what is typically found in the U.S.

There are a few important considerations:

- National dioxin levels have been decreasing over time, so we need to compare our findings to more recent national data when available.
- Dioxins are only one class of chemicals of concern related to the derailment and burn.

## **Representative example: a participant's TEQ value compared to U.S. values**



Data shown in the chart above:

| Measurement                              | Value (pg/g lipid) |
|------------------------------------------|--------------------|
| Representative participant value         | 10                 |
| U.S. average, white males 60+ (2011 CDC) | 18.1               |
| U.S. range, white males 60+ (2011 CDC)   | 10.2 to 25.8       |

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## To learn more about the study

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