



CALIFORNIA REGIONAL EXPOSURE STUDY

Findings from Los Angeles County

Everyone comes into contact with chemicals every day, no matter where they are – at home, in school, or at work.



What is the California Regional Exposure (CARE) Study?

The CARE Study is part of the State of California's efforts to reduce exposures to harmful chemicals. In this study, we measure chemicals in Californians by testing blood and urine samples from volunteers across the state. We also collect information that tells us about how people come into contact with (or are "exposed to") these chemicals.

CARE Study participants get their test results along with fact sheets about the chemicals, including possible health concerns and ways to reduce their contact with harmful chemicals. Summaries of the study findings are also shared with community groups, scientists, policy makers, and the general public.

Results from the CARE Study are also used to:

- Identify and inform individuals and communities with higher chemical exposures
- Support communities in reducing their exposures
- Improve public and environmental health policies in California

What is Exposure?

Exposure means to come into contact with something.

We study people's chemical exposures by looking for chemicals in blood and urine samples, and measuring how much is there.

We also use surveys (questions about where people go, what they eat and drink, the products they use, and their jobs and hobbies) to try to understand how people have been exposed to the chemicals we found in their bodies.

The CARE Study focuses on one region of the state at a time. Our first region was Los Angeles (LA) County.

The CARE Study in LA County (CARE-LA)

CARE-LA took place from February to June 2018. 430 people participated in the study.

All participants were tested for 22 potentially harmful chemicals: 10 metals and 12 perfluoroalkyl and polyfluoroalkyl substances (PFASs).

Most participants gave us permission to use their samples for additional testing. We tested 60 female participants for additional chemicals found in plastics and personal care products like shampoo and sunscreen. We also tested 159 participants for a chemical found in diesel exhaust.

For more information on the CARE Study, visit www.cdph.ca.gov/CARE

What did we learn about CARE-LA participants?

Metals

We tested all CARE-LA participants for ten metals: arsenic, cadmium, lead, mercury, antimony, cobalt, manganese, molybdenum, thallium, and uranium.

- **100%** of CARE-LA participants had lead and arsenic in their bodies.
- More than **90%** of participants had seven or more metals in their bodies.
- **35** participants had levels of metals that were high enough to be of concern, and we contacted them to follow up on their results.
- Asian participants had the highest levels of mercury and arsenic.

Metals are found in nature and are used in many industries and products. People are exposed to metals from many different sources, including food and drinking water, soil and dust in and around homes, and everyday items like jewelry, paint, batteries, and plumbing fixtures.

Helpful or Harmful?

Some metals, like manganese, are essential nutrients, and are good for us in very small amounts, but can be harmful in larger amounts.

Others, like **arsenic, cadmium, lead,** and **mercury,** can be harmful even at low levels.



Lead is harmful even at low levels.

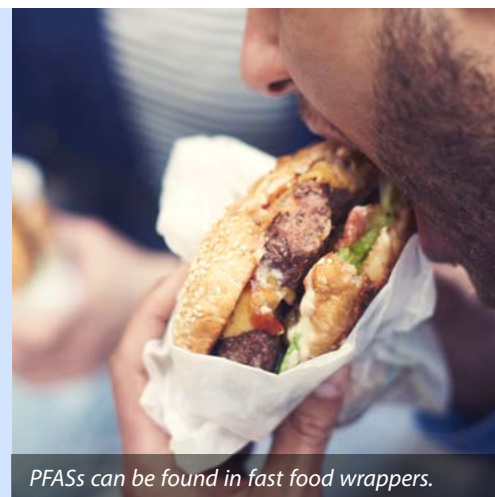
Perfluoroalkyl and Polyfluoroalkyl Substances (PFASs)

We tested all CARE-LA participants for 12 PFASs.

- **99%** of CARE-LA participants had multiple PFASs in their bodies.
- PFOA and PFOS were found in over **97%** of participants.
- Asian participants had the highest levels of certain PFASs in their bodies.

PFASs are human-made chemicals used to make products resistant to oil, stains, grease, and water. They are used in products such as stain- or water-resistant carpets, grease-repellent take-out containers and fast food wrappers, and some personal care products. PFASs are also used in fire-fighting foam and some industrial processes. Studies across the U.S. have found that many drinking water sources, including some in California, have been contaminated with PFASs.

PFASs may affect growth and development of the fetus, infants, and children; harm the immune system and the liver; and increase the risk of thyroid disease and cancer.



PFASs can be found in fast food wrappers.

Metals and PFAS results shown here have also been used to estimate chemical exposures across the entire LA County population. Population estimates are available through Biomonitoring California.

Phenols

We tested 60 women in CARE-LA for phenols. These chemicals are used in receipts and plastics, and as preservatives in personal care and food products.

- **47%** had bisphenol A (BPA), 77% had bisphenol S (BPS), and 23% had bisphenol F (BPF) in their bodies.
- **95%** of the women tested had methylparaben in their bodies; levels were highest among Black women.

We also tested these 60 women for triclosan, an antibacterial chemical that is added to some household items such as cutting boards and shower curtains, and personal care products like toothpaste and make-up.

- **82%** of the women tested had triclosan in their bodies.

Bisphenols are added to receipt paper and some plastics. Some bisphenols can affect the reproductive system and might increase cancer risk.

Parabens are added as preservatives to many personal care products, including make-up, lotions, shaving cream, and shampoo, and some foods. Parabens may affect the way hormones work and may affect fertility.

Triclosan can affect the way the body's hormones work. Overuse of triclosan may cause bacteria to become more resistant to antibiotics.



Bisphenols are used in some receipt paper.

Diesel Exhaust

We tested 159 CARE-LA participants for a chemical called **1-nitropyrene** (1-NP), which is found in diesel exhaust.

- **95%** of the 159 participants chosen for this additional testing had 1-NP in their bodies. This means they were exposed to diesel exhaust.
- We found higher levels of 1-NP in participants who work around diesel equipment.
- Participants who were tested in February generally had higher levels than participants who were tested later in the study. This is probably because air pollution is usually worse in the winter than the spring or summer.

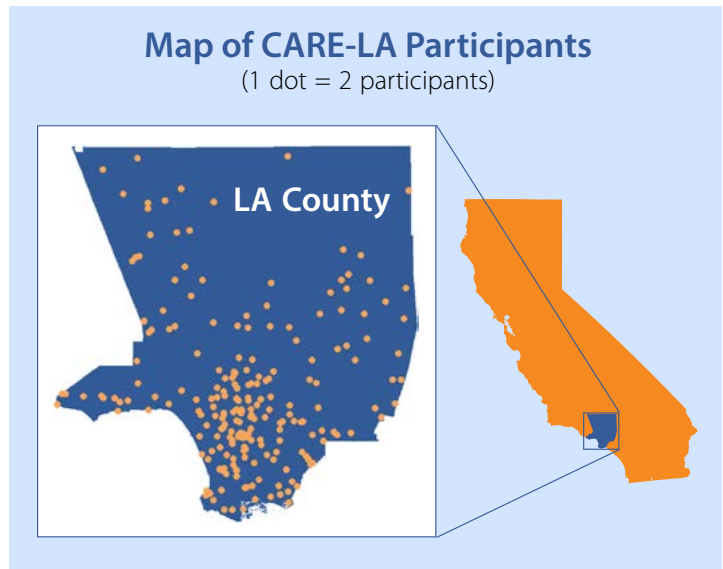
Diesel exhaust is produced by trucks, trains, and other vehicles and machinery that run on diesel fuel. It is a mixture of many chemicals, including 1-NP. Exposure to diesel exhaust can cause cancer and other health problems. We are still learning what measuring 1-NP can tell us about exposure to diesel exhaust.



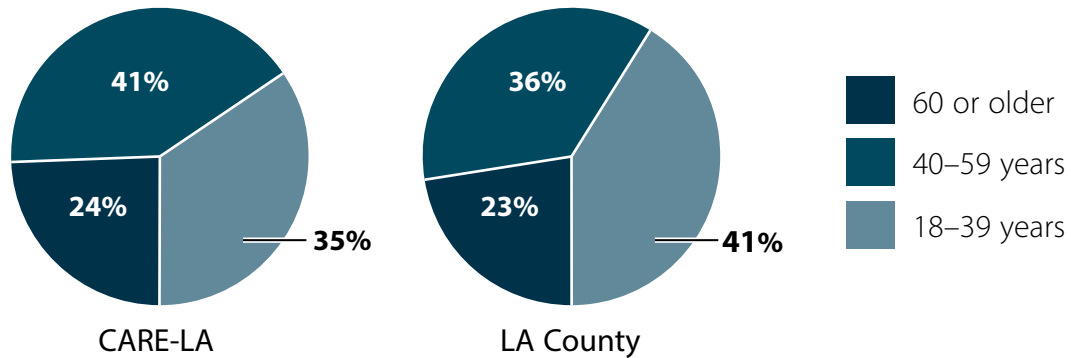
Who participated in CARE-LA?

CARE-LA included people from many different backgrounds.

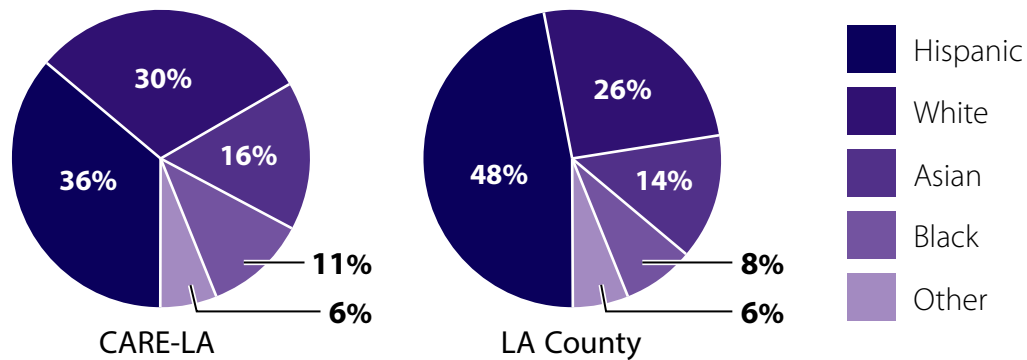
- As shown in the figures below, study participants were similar to the LA County population by age, race, and household income.
- More women (61%) participated than men (38%). 1% of study participants did not identify as either male or female.
- Participants came from across LA County, and 31% were born outside the United States.



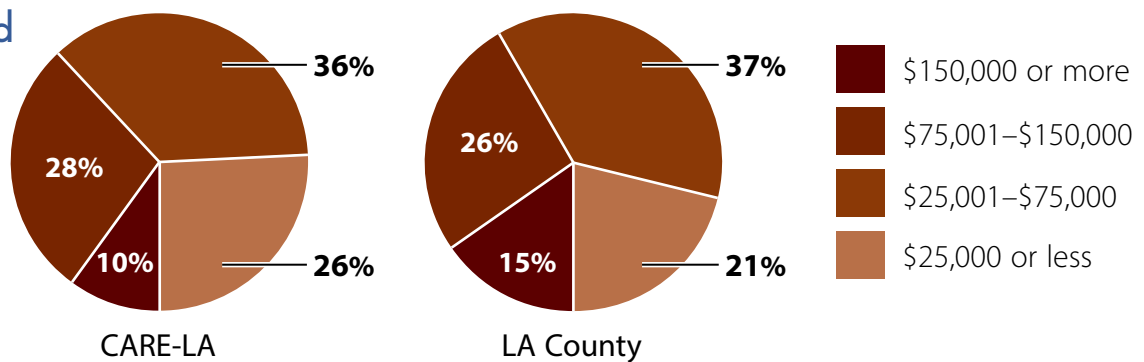
Age



Race



Household Income



The California Regional Exposure (CARE) Study is a Biomonitoring California project.

Biomonitoring California's mission is to:

Measure levels of harmful environmental chemicals in Californians

Track trends in the levels of these chemicals over time

Report our findings to study participants, the public, and policy makers