

# **More than 10% of the US population has high concentrations of 10 or more persistent organic pollutants (POPs)**

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A study led by researchers at the IMIM (Hospital del Mar Medical Research Institute) and Universitat Autònoma de Barcelona (UAB) has analysed the number of persistent organic pollutants (POPs) detected at high concentrations in the population of the U.S. and found relationships with socioeconomic factors, including gender, race, body mass index, education and poverty. More than 10% of the U.S. population has 10 or more POPs, each and all of them at a 'top 10' concentration; that is, at a concentration above the 90th. percentile.

OPs are a group of chemical contaminants that humans can barely excrete and that degrade very slowly, therefore accumulating in our bodies and environment. Most POPs have been used as pesticides or are industrial residues; most POPs contaminate animal and human food webs.

Normally, the 'internal contamination' (within a person's body) by these chemicals is evaluated by checking for each pollutant separately, without analysing the mixture or 'cocktail' of POPs that is always found in a person. And when you look at each pollutant separately, it is clear that the vast majority of the population has low concentrations, while only a small minority of the population has high concentrations of the pollutant when each POP is studied individually.

However, Miquel Porta, José Pumarega and colleagues at IMIM realised

that nobody was looking at all POPs combined in the body of each individual person, and therefore, no one had checked the assumption that the vast majority of the population had low levels of all POPs. The assumption turned out to be untrue.

The 'simple change' made by the researchers (which turned out to be quite radical) was to stop focusing on each POP separately and to focus on all POPs detected in each individual. And they thus discovered that the majority of individuals had at least one POP at high concentrations: specifically, 67 percent of participants in the study had one or more POPs at concentrations above the 90th percentile (the 'top 10' or highest 10 percent).

They also discovered that a significant minority had several POPs each at high concentrations. In fact, 13 percent of the U.S. [population](#) has 10 or more POPs at high concentrations; i.e., each POP is in a 'top 10' concentration (that is, at a concentration above the 90th. percentile).

The study analysed POP levels in 4,739 people included in the U.S. National Health and Nutrition Examination Survey (NHANES). They calculated the number of POPs with blood concentrations greater than levels considered to be high.

"This pattern of many POPs at high concentrations is nine times more common in black people and four times less common in Mexican Americans than in the non-Hispanic whites. Therefore, the number of POPs at high concentrations is related to race (or ethnicity). We also found that the poorest people have more POPs at high levels, and such number of POPs at high concentrations also increases with age and the [body mass index](#)," says José Pumarega, researcher at IMIM and at CIBER de Epidemiología y Salud Pública (CIBERESP).

**More information:** José Pumarega et al. Number of Persistent

Organic Pollutants Detected at High Concentrations in Blood Samples of the United States Population, *PLOS ONE* (2016). [DOI: 10.1371/journal.pone.0160432](https://doi.org/10.1371/journal.pone.0160432)

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