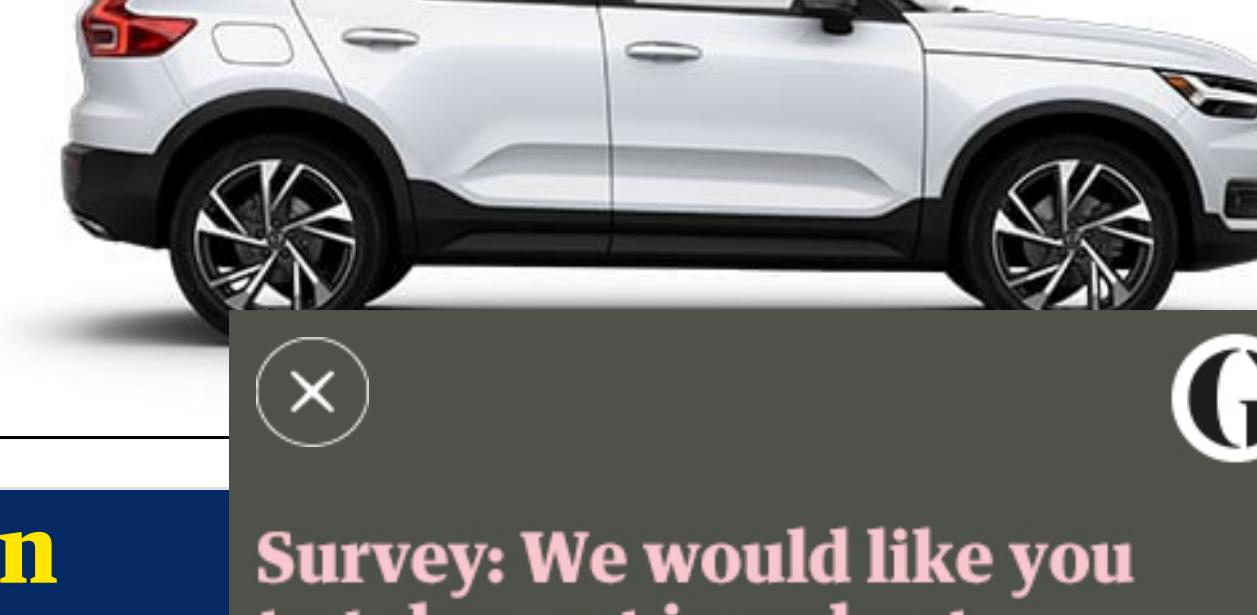
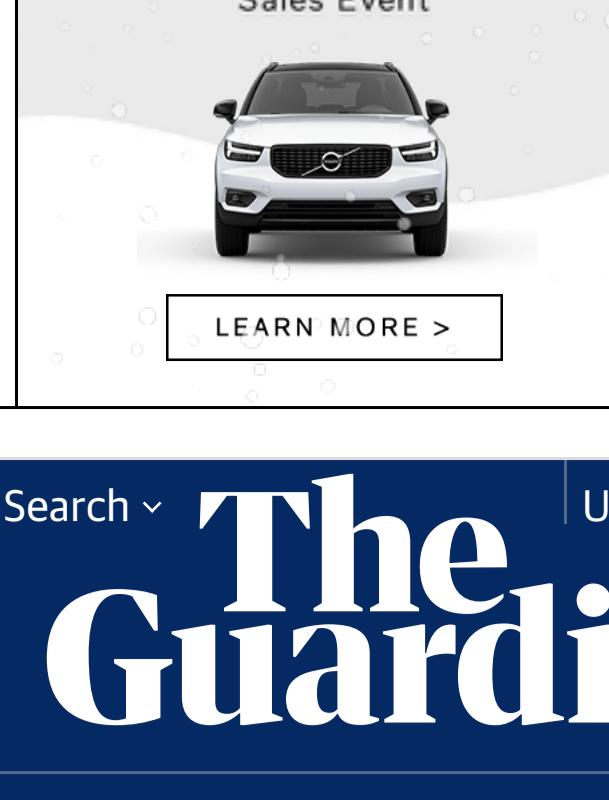


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### Coronavirus

**Oliver Milman**

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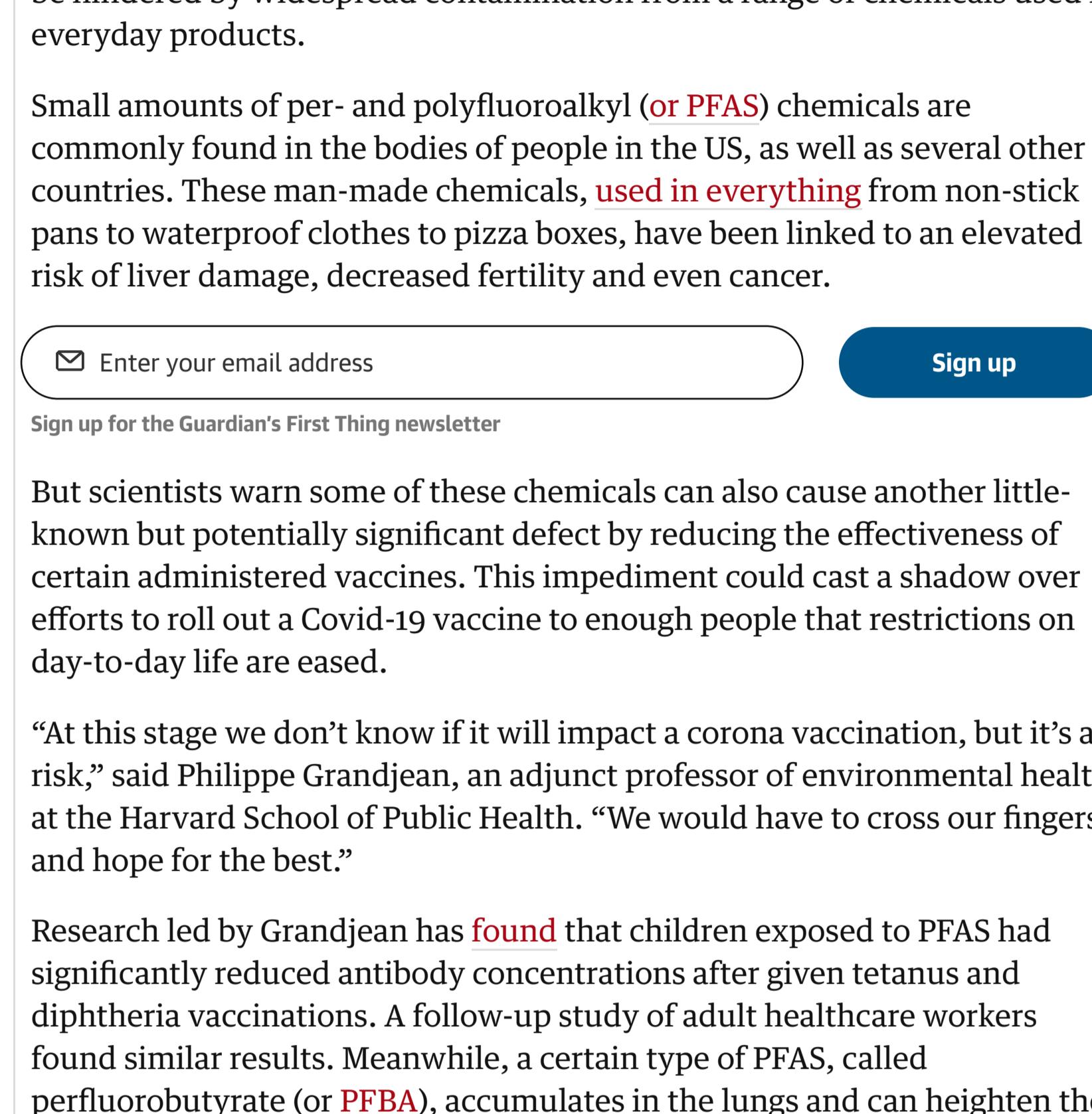
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## Covid: chemicals in everyday products could hinder vaccine

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Researchers worry PFAS, commonly found in the bodies of Americans, will reduce the immunization's effectiveness



▲ David Rach volunteers to test the Covid-19 vaccine developed by Pfizer. Photograph: PFIZER/Reuters

The successful uptake of any vaccine for Covid-19, a crucial step in returning a sense of normalcy after a year ravaged by the coronavirus pandemic, could be hindered by widespread contamination from a range of chemicals used in everyday products.

Small amounts of per- and polyfluoroalkyl (or PFAS) chemicals are commonly found in the bodies of people in the US, as well as several other countries. These man-made chemicals, used in everything from non-stick pans to waterproof clothes to pizza boxes, have been linked to an elevated risk of liver damage, decreased fertility and even cancer.

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But scientists warn some of these chemicals can also cause another little-known but potentially significant defect by reducing the effectiveness of certain administered vaccines. This impediment could cast a shadow over efforts to roll out a Covid-19 vaccine to enough people that restrictions on day-to-day life are eased.

"At this stage we don't know if it will impact a corona vaccination, but it's a risk," said Philippe Grandjean, an adjunct professor of environmental health at the Harvard School of Public Health. "We would have to cross our fingers and hope for the best."

Research led by Grandjean has found that children exposed to PFAS had significantly reduced antibody concentrations after given tetanus and diphtheria vaccinations. A follow-up study of adult healthcare workers found similar results. Meanwhile, a certain type of PFAS, called perfluorobutrate (or PFBA), accumulates in the lungs and can heighten the severity of illness suffered by people who are infected with Covid-19, separate research by Grandjean, yet to be peer-reviewed, has suggested.

German company BioNTech and the US pharmaceutical giant Pfizer provoked a surge of optimism over an impending Covid vaccine after announcing a contender was 90% effective in preventing people from falling ill with the disease. The scientist behind the vaccine has predicted it will "bash the virus over the head" and help lift the pandemic that has crippled much of the world since the beginning of the year.

The Pfizer vaccine is based on messenger RNA genetic material and it's uncertain if PFAS contamination would disrupt its efficacy in patients. But there are several other vaccine contenders that are formulated around the protein spikes of the virus, similar to vaccines for tetanus and diphtheria, and they may well also have poor results in people who have ingested PFAS.

"People with high exposure to PFAS have a non-protective and very low antibody levels after four vaccinations for diphtheria and tetanus," Grandjean said. "So if a vaccine for Covid is similar, the PFAS will likely inhibit the response from a vaccine. But it is an unknown at this stage."

The US president-elect, Joe Biden, has promised to crack down on PFAS pollutants by classifying them as hazardous substances. It is estimated more than 200 million Americans eat food and drink water laced with PFAS, known as "forever chemicals" as they linger long in the body, with hotspots found in areas around military bases where the chemicals are used in firefighting foam.

Despite this, only a few states require drinking water to be largely free from PFAS, a situation that a Biden-controlled Environmental Protection Agency will probably intervene in with new federal limits.

Any new regulation of PFAS will now have an added urgency, with a Covid vaccine expected for the vast majority of Americans by mid-2021. "I do worry constantly about exposure for both known and unknown PFAS, and the impacts they are having on both our immune systems and on our health in general," said David Andrews, a senior scientist at the Environmental Working Group. "PFAS exposure is an urgent public health crisis."

### The real work is just beginning ...

... following Joe Biden's victory in the 2020 election. A majority of Americans chose a different path. These voters rejected four years of divisiveness, racism and sustained assaults on constitutional democracy - but it is clear that the country remains bitterly divided. Removing the sitting president from the White House is one thing, but fixing America is another - because many of the problems facing America pre-date President Trump.

As the country begins a new chapter, the need for robust, fact-based journalism that highlights injustice and also offers solutions is as great as ever. In addition to a pandemic, the new president will need to confront a divided country, a stark racial wealth gap, a climate crisis and an electoral college that increasingly favors a demographic minority to dominate the levers of power.

The Guardian welcomes the opportunity to refocus our journalism on the opportunities that lie ahead for America minus the distraction of a daily White House soap opera. We will focus on the need to fix a broken healthcare system, restore the role of science in public life, repair global alliances, and address the corrosive racial bias in our schools, criminal justice system, housing and other institutions.

But we can't do this on our own. We need your support to carry on this essential work. We rely to an ever greater extent on our readers, both for the moral force to continue doing journalism at a time like this and for the financial strength to facilitate that reporting.

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