

Doctors raise the alarm:

How ill are we becoming from plastics?

In 2050 we will be able to wrap the planet 800 times with the plastic that we will produce in that one year. According to the [Ellen McArthur Foundation](#), there will then be more plastic in the oceans than fish. Exactly one century before 2050, in 1950, there were still only 1.5 million tons of plastic being produced and with all those light disposable products, the life of the housewife appeared more modern and rosy than ever. Tidying up and cleaning were seen as a waste of time, and 'Throw away living' as *the* modern way of life. Since then, the world has undergone a rapid and life threatening change.



SOME FIGURES

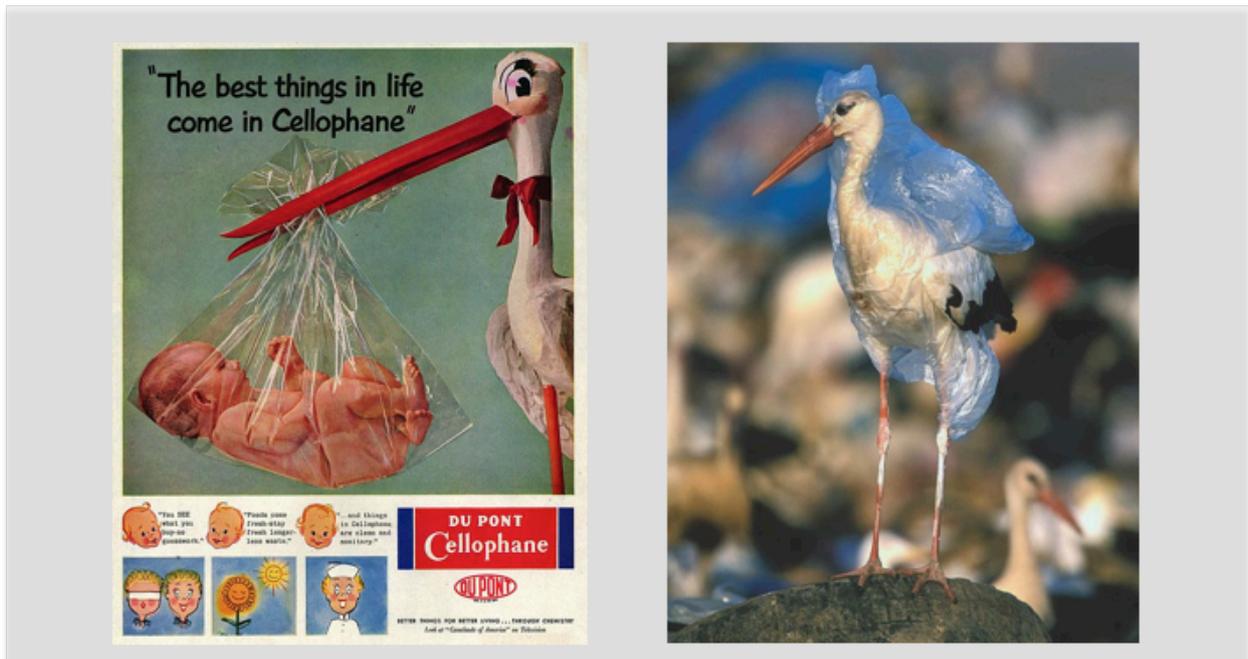
Since plastic was invented, its production increased to 311 million tons in 2014. This will double in 20 years' time to 622 million tons.

[According to UNEP](#), the United Nations Environment Programme, plastic pollution costs 75 billion US dollars every year. Of this, the plastic soup costs at least 13 billion dollars every year, though the researchers think that this is vastly underestimated. These amounts are exclusive of any resulting costs of health care of humans and animals.

HOW ILL ARE WE BECOMING OF PLASTICS?

SCIENTIFIC UNDERPINNING

What is all this indiscriminate production and consumption of plastic doing to our bodies? More and more scientists and doctors are becoming increasingly concerned about this, including the American oceanographer and discoverer of the Great Pacific Garbage Patch and the Plastic Soup, Captain Charles Moore: “Plastic is in the air that we breathe, it has become part of the soil and the animal kingdom. We are becoming plastic humans.”



Are illnesses such as cancer, diabetes, obesity, fertility problems, birth defects and ADHD increasing at the same rate as the annual production of plastic? The plastics of which we discard half, the single use plastics, within 20 minutes.

What we do know is that evidence of the dangers of plastics and their added plasticizers and flame retardants is piling up dramatically. Also, we are becoming aware that some of these additives contain chemical substances that have a serious effect on our hormone balance.

- Animals such as whales, sea birds, fish and shellfish confuse plastic with food and suffer the consequences of ingestion.
- In 2013, scientists at the Plymouth Marine Laboratory in England [filmed](#) plankton, the base of the food chain, [consuming plastic](#).
- Researchers at the University of Lund (Sweden) have [demonstrated](#) that nanoplastics can move through the food chain and affect the animals at the top it.



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- Microplastics are found in 63% of the [prawns](#) in the North Sea.
- [Japanese oysters](#) filter microplastics out of the water, the consequences of which are fertility problems and deformed offspring.
- Italian research shows that the consumption of polyvinyl chloride (PVC) can [damage](#) the intestines of sea bass.
- [American scientists](#) have discovered that microplastics can cause liver cancer in fish kept under laboratory conditions.
- A quarter of the fish bought at local fish markets has [plastic in their digestive tracts](#). Scientists concluded this from researching fish from fish markets in Indonesia and California.
- And very recently, in July 2016, scientists demonstrated for the first time that [microplastics can leak toxic chemicals in the bodies of fish](#). Scientists at three Japanese universities had previously linked [chemicals in the tissue of sea birds to plastics in their stomachs](#).



FROM ANIMALS TO HUMANS

There are enough reasons to do more scientific research into the health risks for humans. In June 2016, the Dutch scientists Dick Vethaak and Heather Leslie addressed this issue in a pioneering publication in the *Environmental Science & Technology* journal entitled '[Plastic Debris is a Human Health Issue](#)'. They looked at three core issues:

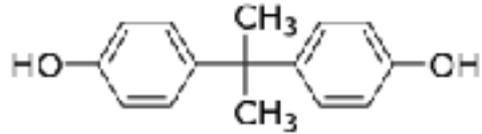
- Plastic contains several added chemicals, including hormone disruptors. What damage do these chemical substances cause and/or what are the physical consequences?
- Plastic can be a carrier of viruses and parasites. What is this doing to our bodies?
- Nanoplastics can pass through our cell membranes. What are the consequences?

Vethaak and Leslie estimate that the damage caused to human health can amount to billions and they link this to the overproduction and over consumption of plastic coupled with a lack of knowledge.

HOW ILL ARE WE BECOMING OF PLASTICS?

Desktop research shows a few indications that demonstrate the urgency of this issue:

- The hormone disruptors that are added to plastics are already found in our blood. This was proven by Professor Sauer, pediatrician in Groningen, the Netherlands, in 2004. He researched six hazardous substances, including plasticizers, bisphenol A (BPA) and flame retardants. Several of the substances were [found](#) in every blood sample.



- Anna Cummins, co-founder of the American 5 Gyres Institute, also wanted to see what substances her blood contained. She had her blood tested for various toxins – the so-called Persistent Organic Pollutants (POPs) – that can attach to plastics. To her horror, the examination showed traces of toxic polychlorinated biphenyl (PCB), dichlorodiphenyltrichloroethane (DDT), perfluorinated compounds (PFC) and a high concentration of flame retardants.
- Greenpeace found similar results in 2004. An analysis of the blood of 91 people showed that [their blood contained](#) chemical substances such as plasticizers and flame retardants, sometimes in dangerously high concentrations. One year prior to this, in 2003, the WWF had [comparable results](#) when they tested the blood of 39 members of the European Parliament for toxic chemicals.
- Researchers from the American Silent Spring Institute demonstrated in 2011 that the levels of additives BPA and DEHP in urine [drastically declined](#) if people avoided plastic-packaged food. On average, BPA levels decreased with 66% and DEHP with 56%. This year, Austrian scientists [achieved similar results](#) when the same chemicals were analyzed in urine of an Austrian family.
- Entirely new and shocking is the [evidence](#) that nanoplastics can pass through our cells and cell membranes. Plastic in our bodies can come from various sources. We can swallow plastic microbeads in products such as toothpaste, or we can consume it through eating fish and shellfish and a host of other products. We can also [breathe in](#) the microplastics and nanoplastics that float around in the air.

IGNORED 'CALLS FOR ACTION'

It is not only scientists that are worried about the risks attached to plastic. Large independent authorities are worried too.

In 2012, the World Health Organization (WHO) had already published a report, based on the scientific evidence available at that time, which concluded that hormone disruptors were a worldwide hazard.



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In 2013, 89 international scientists issued a warning. They signed the [Berlaymont Declaration](#) in which they stated that there had never been so many endocrine-related diseases before. They pointed to the huge increase in breast-, prostate- and testicular cancer and other hormone-related conditions in Europe.

In June 2016, the Dutch WEMOS foundation issued a clear report entitled "[Maatregelen tegen hormoonverstorende stoffen](#)" (measures against hormone disruptors, in Dutch) which examined national regulations in Denmark, Sweden and France.

- The Swedish government is worried about hormone disruptors and has come up with an action plan called *Toxic free environment*. It banned BPA in food packaging for children aged up to 3 years old as early as April 2012. On top of this, Sweden is trying to avoid importing products with BPA and phthalates.
- Before this, France had already called for more research into BPA given the 'red flags'. BPA was banned in baby bottles in 2010 and in all packaging and contact materials on December 23rd 2012.
- In contrast, Denmark refrained from banning hazardous phthalates in medical tools. Under EU regulations, national governments may not individually ban medical equipment that meet EU standards.
- A recent [evaluation by the University of Utrecht](#) shows that about 80 diseases are linked to exposure to hormone disruptors. These include endocrine-related tumors, as well as diseases such as obesity, cryptorchism, endometriosis, asthma and ADHD. A cost estimate was made of 16 of the more than 80 diseases. This revealed that it costs Europe approximately 46 to 288 billion euro in sickness costs.



Inconceivably, the European Union is taking no action, even though they should have already taken measures at the end of 2009 with a deadline in 2013. The EU came with so-called impact assessments instead. In reaction to this, Sweden instituted proceedings against the EU with Dutch support and won: In December 2015, the European Court of Justice passed judgement that the [European Commission had violated the law](#). In May 2016 this resulted in a proposal by the European Commission to come with a definition for hormone disruptors. The criteria are so extensive however, that based on this, barely any additives will be banned and – according to Wemos – that means that a great amount of research money used to determine the harmful effects of hormone disruptors was spent in vain

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One salient point is that a number of hospitals have taken it upon themselves to reduce or ban PVC, a type of plastic that contains many hormone disruptors.

- Vienna Hospital, Austria: has had a PVC free ward for sick and premature babies since 2001.
- Karolinska University Hospital, Sweden: has been reducing the use of PVC since 1997.
- West-Fries Gasthuis, Hoorn, the Netherlands: the only hospital in the country that has an almost PVC free children's ward.



The [European Food Safety Authority \(EFSA\)](#) revealed in June 2016 that it views microplastics and nanoplastics as a potential hazard for food safety. The consumption of fish and shellfish that contain microplastics and nanoplastics may pose health risks.



The United Nations Environment Programme (UNEP) also expressed her concerns about this in [a new report](#) issued this year. Apart from shellfish, the intestines of fish for human consumption are almost always removed. What is the risk that chemical substances from ingested plastic are passed onto humans?

In this case there is a little light at the end of the tunnel. In 2016, [Canada](#) was the first country in the world to add plastic microbeads to its list of toxic substances.

A NEW CALL FOR ACTION

“Those who do not want to listen, will have to feel”, says the Austrian eye specialist and board member of *Surfing Medicine International*, Ognjen Markovic. “This is why we are calling for action.” Markovic represents a group of about 1,000 doctors and scientists across the world. He says that “there are many indications that plastic is dangerous for our health, but there is no hard evidence. This is why we want money to be made available as quickly as possible for major research that will look at questions such as:

- How much plastic is there in our blood and tissues?
- Are small plastic particles accumulating in our liver and/or brains?
- How do these small plastic particles enter our bodies?
- What is the most important route? Is it by breathing plastic particles, touching toys, through plastic packaging, from wearing synthetic clothing, using cosmetics or through the food chain?

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- Are we gradually being poisoned by plastics and their associated hormone disruptors and/or the chemical substances such as POPs that attach to plastics?
- To what degree is our health really at risk?
- Are pregnant women and children at greater risk?"
Recent research by Wemos shows the presence of hormone disruptors in the fluid behind the lungs of newborn babies.



To fortify the Call for Action, *Surfing Medicine International* calls upon doctors and scientists around the world to support the call by leaving their name on: www.change.org/p/noplasticsinmybody.

WEMOS is the first organisation to support the doctors.

The Dutch Plastic Soup Foundation supports the Call for Action and facilitates where possible. Maria Westerbos, founder and director: "It is hard to believe that even the largest health organisations and most prominent scientists are stoically ignored by the European Union. Even the plastics industry ignores the signals over and over again. And in the meantime, the production of plastics is increasing dramatically even in the face of all the negative consequences. I sometimes think that the world has gone mad and that everything only revolves around making money."

The Plastic Soup Foundation calls upon everyone in the world to support *Surfing Medicine International's* Call for Action.

Westerbos: "We can only make a difference if we stand together. So let's do this and try to leave a healthier world behind for our children instead of a completely sick planet."

STAKEHOLDERS

Plastic Soup Foundation

The Plastic Soup Foundation (PSF) wants to call a halt to the increasing plastic contamination of our oceans. The PSF wants to strongly advocate for that no more plastic enters in the sea in the future

www.plasticsoupfoundation.org



Surfing Medicine International

Surfing Medicine International wants to support, research, and create botanical remedies for human disease and water pollution.

www.surfingmed.com



SURFING MEDICINE
INTERNATIONAL

Wemos

WEMOS advocates for improved human health worldwide and proposes policy improvements that prioritise health.

www.wemos.nl

