

Submission to:

SENATE SELECT COMMITTEE ON PFAS (PER AND POLYFLUOROALKYL SUBSTANCES)

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On behalf of the Council for the Human Future

The global perspective

Today around 24 per cent of global deaths, around 14 million fatalities per year, are attributed by the World Health Organisation (WHO) to toxic chemistry in the human living environment.³ This is the largest single act of homicide in human history – about double the annual death rate of WW2, for example. It is mainly attributable to the production of synthetic chemicals, mostly of unknown toxicity, or to naturally-occurring toxic chemicals which are mobilised by various human industrial activities, including mining, mineral processing, farming, transport and construction. It is “one of the largest environmental threats” to humanity.⁴

Industrial civilisation produces at least 350,000 different chemicals,⁵ which are mainly the derivatives of fossil fuels. This may well be an underestimate – and is certainly an underestimate for the millions of daughter products from these substances produced either by breakdown, mixing or recombination with other substances. Science currently estimates there are about 12,000 PFAS chemicals and byproducts.⁶ PFAS thus account for about 3% of all the chemicals synthesised by industry worldwide. Like the famous example of DDT, PFAS consist of exceptionally rugged molecules which are hard to break down, easy to mobilise and which may linger for decades, causing harm.

Unlike greenhouse gases, the total volume of chemicals emitted by human activity into the biosphere has never been scientifically assessed – an appalling oversight. However, including such products as mining spoil, soil erosion, combustion byproducts of fossil fuels, mineral extraction, waste disposal, gases, plastics and contaminated water, total human chemical emissions are today conservatively estimated at around 220 billion tonnes per year.⁷ This total includes ~40 billion tonnes/yr of greenhouse gases, which affect the climate as well as causing air pollution. Global poisoning, it should be noted, is currently 5 times larger and ten times more deadly than climate change – yet receives not a fraction of the recognition and remedial action.

¹ *Earth Detox*, Cambridge University Press 2017

<https://www.cambridge.org/us/universitypress/subjects/earth-and-environmental-science/environmental-science/earth-detox-how-and-why-we-must-clean-our-planet?format=PB>

² Allan and Unwin 2007.

³ WHO <https://www.who.int/data/gho/data/themes/public-health-and-environment>

⁴ Naidu R, Cribb J et al. Chemical pollution: A growing peril and potential catastrophic risk to humanity <https://www.sciencedirect.com/science/article/pii/S2772985024000541>

⁵ Wang Z, Toward a Global Understanding of Chemical Pollution: A First Comprehensive Analysis of National and Regional Chemical Inventories, *Env Sci Technol*, Jan 22, 2020, <https://pubs.acs.org/doi/full/10.1021/acs.est.9b06379>

⁶ Professor Ravi Naidu, CRC CARE

⁷ <https://www.sciencedirect.com/science/article/pii/S0160412021002415>

Manufactured chemicals, at 2.5 bt/yr constitute only about 1.1% of total human chemical emissions, although they are by far the most toxic proportion. Fossil fuels mined contribute a further 7.7%. It can thus be seen that purposefully-made or -extracted chemicals constitute only the mere tip of the iceberg of *total human chemical emissions*. Considering this vast, poisonous waste stream one chemical, or even group of chemicals at a time, is therefore to ignore the totality of the problem, which currently affects *every human being on Earth, every day, for all their life*, killing one-in-four and injuring billions. Any Senator who does not believe this is encouraged to have their blood tested.

So far, out of 350,000 manufactured chemicals, the Stockholm Convention has assessed and banned only 30 chemicals or families of chemicals (including PFAS), since its adoption in 2001 – a rate of just over one per year. At such a rate it would take more than 300,000 years – longer than the entire span of modern human existence so far⁸ – to assess the remainder. However, the US and EU alone add 700 and 1700 *new* chemicals respectively, to their inventories each year,⁹ many without assessment for human or environmental health and safety (UNEP). The scope for fresh disasters like PFAS is thus growing exponentially, while safety assessment (like this current inquiry) one chemical at a time may at present rates take a million years or more.

These toxic emissions observe no boundaries. All are now part of the Global Chemical Circulation¹⁰, a river of human-emitted chemicals that circulates around the planet in air, water, food, on soil particles, in animals and plants both wild and domestic, in and on people and in traded goods. No country's regulatory system, no matter how thorough, can prevent their entry or egress. It is a global problem, not a national one.

The human impact

Given the current very high rate of human deaths attributable to man-made chemicals and their byproducts, regulating them one chemical or chemical family at a time before the deaths reach hundreds of millions is most unlikely to succeed. Even if it were to be achieved in some countries, experience has shown that chemical manufacturers simply move to other countries where regulatory scrutiny is laxer, more corrupt or does not exist. In the industrial age, the quantum of man-made toxic chemical pollution, like the quantum of climate pollution, increases over time.

Health authorities, regulators, chemical corporates and universities are well aware that a high human price is being paid for unrestrained chemical use – yet nothing substantive is being done to prevent or alleviate it. That is why the 14 million deaths are here labelled as homicides, in that they are committed knowingly and with the tacit approval of governments, regulators and chemical companies. The chemical poisoning of humanity is a holocaust 10-15 times worse than the tragic WWII event – and is presently 'denied' (ie. ignored) by every country on Earth, including Australia.

However toxic chemicals have an impact even larger, and potentially worse than the deaths they cause. Many of these substances are neurotoxins, or nerve poisons, and have dire effects on the human brain and central nervous system. Scientists have already noted evidence for a 13

⁸ <https://www.britannica.com/story/just-how-old-is-homo-sapiens>

⁹ <https://pubs.acs.org/doi/10.1021/acs.est.2c09353>

¹⁰ Earth Detox pp49-50

per cent decline in human IQ since 1975¹¹, a decline which remains unexplained other than the conclusion that it is ‘environmental’ (ie caused by something in the human living environment) and not genetic. If current rates of IQ decline persist, the generation of humans born in the 2020s will be around 24% less intelligent than the generation that fought in WWII. This has serious implications for democracy, education, crime rates and the ability of humans to function in an advanced society, as well as for their mental health and care.

The poisonous effect of certain chemicals on the human brain has been known for over 2000 years: the Romans and Greeks were familiar with the toxic effects of lead and mercury on the brain. In more recent times a catalogue of industrial chemicals has added to the damage, notably organochlorine pesticides and PCBs, especially in growing children¹².

The impact of PFAS on human health is still a relatively understudied field, but the latest research strongly links them to neurodevelopmental disorders in children. These disorders include “cognition and memory impairment, autism spectrum disorders, attention deficit hyperactivity disorders, and neuromotor development impairment,” all of which are pandemic among children worldwide today. Early reports also link toxic chemistry to the growth in rates of Alzheimer’s, Parkinson’s and other age-related mental disorders. In short, current science shows that PFAS, even in apparently innocent forms like fabric fire-retardants, fire-fighting foam and plastics, are capable of inflicting life-long damage on individuals.

Recent research has also linked PFAS to plastics¹³, now spread throughout the human environment, in our food¹⁴, water, homes, personal care products and bodies – including our brains¹⁵ – as well as the oceans and atmosphere.

At present, according to WHO, one human in every eight suffers from a mental disorder¹⁶ - currently this totals over one billion people. The spread of mental disease in the human population is rapid and largely unexplained. However, the brain is the most chemically-sensitive organ in the human body. At present rates of increase, by the mid-century a quarter of the human population will either suffer from a mental disease or be involved in caring for someone who does, causing a drastic diversion of human productive capacity from other economic activities. The avalanche of 220 Gt of man-made and -generated toxic chemistry is increasingly regarded by scientists and medical researchers as a probable cause, and PFAS are among the known brain poisons.

Environmental impact

The Global Chemical Circulation is being linked in an increasing number of scientific studies to extensive damage to the Earth’s life support and biotic systems. Worldwide, there has been a collapse in both insect numbers and diversity¹⁷, which has been linked to two forms of man-made chemical pollution: use of pesticides and climate change caused by carbon emissions.

¹¹ <https://www.pnas.org/doi/abs/10.1073/pnas.1718793115>

¹² <https://www.thelancet.com/action/showPdf?pii=S1474-4422%2813%2970278-3>.

¹³ <https://www.sciencedaily.com/releases/2023/03/230307114431.htm>

¹⁴ <https://blogs.edf.org/health/2021/07/07/beyond-paper-pfas/>

¹⁵ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC11100893/>

¹⁶ <https://www.who.int/news-room/fact-sheets/detail/mental-disorders>

¹⁷ <https://www.sciencedirect.com/science/article/abs/pii/S0048969723045643?via%3Dihubs://www.une.org/news-and-stories/story/insect-declines-are-stark-warning-humanity>

The global decline in insects has led to rapid decline in the species that depend on them – birds, frogs, reptiles, fish etc.¹⁸ Half the world’s bird species are in decline, while frogs are the world’s most threatened class of vertebrates and 79% of reptile species are in decline. Man-made toxic chemistry is regarded as a significant causative factor by most studies. That today’s chemicals are becoming far more toxic and hence, dangerous, is illustrated by the following diagram which compares the toxicity of newer farm chemicals with DDT.

RELATIVE TOXICITY FOR BEES, OF SOME COMMONLY USED CROP-PESTICIDES, 1945 - 2014

Pesticides : toxicity / bees (LD₅₀ ng/bee)					
pesticide	®	Use	Dose g/ha	LD50 ng/ab	Tox/DDT
DDT	Dinocide	insecticide	200-600	27 000.0	1
thiaclopride	Proteus	insecticide	62,5	12 600.0	2.1
amitraz	Apivar	acaricide	-	12 000.0	2.3
acetamiprid	Supreme	insecticide	30-150	7 100.0	3.8
coumaphos	Perizin	acaricide	-	3 000.0	9
methiocarb	Mesurool	insecticide	150-2200	230.0	117
tau-fluvalinate	Apistan	acaricide	-	200.0	135
carbofuran	Curater	insecticide	600	160.0	169
λ-cyhalothrine	Karate	insecticide	150	38.0	711
thiaméthoxam	Cruiser	insecticide	69	5.0	5 400
fipronil	Regent	insecticide	50	4.2	6 475
imidaclopride	Gaucho	insecticide	75	3.7	7 297
clothianidine	Poncho	insecticide	50	2.5	10 800
deltamethrine	Décis	insecticide	7,5	2.5	10 800

REF: Dr BONMATIN Jean-Marc, Centre National de la Recherche Scientifique, France

Several new reports link wildlife declines specifically to PFAS poisoning, in birds, turtles, seals, fish, alligators etc.¹⁹ Scientists have found PFAS in 625 species of wildlife worldwide²⁰. The health impacts in humans probably mirror those occurring in wildlife globally, one analysis says.

It is clear that PFAS, along with a battery of other man-made toxins, are implicated in the Sixth Extinction, which poses an existential threat to humans as well as to wildlife.

Neither can survive on a planet where life collapses in a major extinction event.

¹⁸ https://wwflpr.awsassets.panda.org/downloads/lpr_2022_full_report.pdf

¹⁹ <https://news.mongabay.com/2023/09/pfas-forever-chemicals-harming-wildlife-the-world-over-study/>

²⁰ <https://www.ewg.org/news-insights/news/2023/02/wildlife-warning-more-330-species-contaminated-forever-chemicals>

Conclusions

1. PFAS consist only of 3% of 1% of total man-made chemical emissions (0.003%). Even the most rigorous national measures to ban or control these substances are therefore unlikely to alter the trajectory of human and wildlife poisoning overall. This inquiry has not been asked to address the main problem, which is a grave oversight, but only one piece of a 10,000-piece jigsaw. This 'one-chemical at a time' approach is liable to result in permanent, ongoing policy failure.
2. A far more comprehensive approach to overall chemical pollution and poisoning is strongly warranted, and this Inquiry should draw attention to this fact.
3. Australian measures to ban, remove or remediate all PFAS nationally, no matter how comprehensive, will not prevent future exposure of Australians, Australia or its wildlife to PFAS due to the Global Chemical Circulation.
4. There are many, low-cost measures which Australia might take to mitigate the larger threat of global poisoning. These include:
 - a. Help form and lead a *Clean Up the Earth* partnership by joining hands with likeminded organisation and countries all around the Planet
 - b. Eliminate coal, oil, gas & other fossil fuels completely, as the primary sources of toxic chemical pollution and harm to children.
 - c. Ban the deliberate use or incidence of toxins in the food chain and drinking water
 - d. Introduce preventative healthcare, which does not rely on toxic chemotherapies.
 - e. Train all young scientists, especially chemists, – like doctors – to 'first, do no harm'
 - f. Educate consumers and children to choose non-toxic products.
 - g. Encourage them to reward industry by 'buying green'.
 - h. Introduce clean-up measures such as Zero waste, green chemistry, product stewardship, industrial ecology etc.
 - i. Require that *all* chemical products used in Australia be tested and registered for human and environmental safety.
 - j. Help to establish a world database of toxic chemicals as quickly as possible.
 - k. Commission an Intergovernmental Panel on Global Poisoning to quantify and assess the whole of the human chemical emissions and their impact on humanity, the Earth System and wildlife (as is now done by the IPCC for climate).
5. Until 2020 Australia had a government-funded Centre to investigate industrial toxicity and develop solutions to it – CRC CARE. This was defunded three years ago, signally the government's lack of interest in the poisoning of the population. This inquiry should strongly urge the re-establishment of independent, government-funded research into this deadly assault on the public health.
6. Until the late C19th humanity had lived, for over 300,000 years in an environment almost entirely free from man-made toxic chemical pollution. A clean world is thus a human right, enjoyed by many thousands of generations – but denied to the last five or six generations, and the last two in particular. Today no person lives without constant exposure to man-made pollution.

Australia should advocate the introduction in the Universal Declaration on Human Rights of a new right – a *Right Not to be Poisoned*. Without such a right it is doubtful if

humanity will ever be fully aware of the toxic assault to which it is daily subjected, or take timely action to prevent it. ²¹

This inquiry **should recommend to the Government that Australia champion the introduction of a *Right Not to be Poisoned*, under the UDHR** ²² and within the United Nations as an essential step in the global recognition needed to address this vast, gravely underestimated threat to human survival and wellbeing.

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²¹ Earth Detox pp242-4

²² <https://www.un.org/en/about-us/universal-declaration-of-human-rights>