

# Our everyday *toxic* life

Authors of *Slow Death by Rubber Duck*, Rick Smith and Bruce Lourie, say most people are being poisoned every day of their lives by toxic products at home or at work. Even those seeking to live an organic life can find it hard to avoid the dangers. JO IMMIG met with the authors to discuss their findings.

ON FIRST MEETING IT'S EASY TO see how Smith and Lourie ended up in an apartment together for a week experimenting on themselves with toxic chemicals. There's a humorous, boyish rapport between the two, which is also present throughout their book.


Of course, there's a serious side too. They're on a mission to find out the truth about the toxic chemicals in everyday products and to do something about it. They hope the book will help to educate people and, ultimately, influence decision-makers the world over to start making changes that make our lives safer. Many of the chemicals they tested have been implicated as hormone disruptors or have been found to be potentially carcinogenic, as recognised by organisations such as the United Nations (see its Stockholm Convention on Persistent Organic Pollutants<sup>1</sup>).

The authors give a blunt warning early on in our conversation:

"Unless Australia catches up with rapidly changing chemical regulations around the world, like the REACH program<sup>2</sup> in the European Union (EU), it risks becoming the recipient of crappy toxic items the rest of the world doesn't want any more," says Smith. "It's outrageous, I found BPA [bisphenol-A, a common industrial chemical used in the manufacture of some plastics] baby bottles for sale here that are illegal in Canada and in many states of the USA."

(As we go to print, it was announced that BPA baby bottles would be phased out of major Australian stores).

The idea to focus on "personal



Phthalates are used as softening agents in many products, including toys. When kids chew on such a toy, the phthalates are released into their mouth and start accumulating in their bodies.

pollution” came about during a brainstorming session with campaigners at Environmental Defence, Canada’s leading environment group, where Smith is executive director and Lourie is president.

“Everyone felt the pollution debate had grown stale and that we needed to find new ways of breathing life into it,” Smith says. The eureka moment came when a young campaigner suggested that instead of always measuring pollution “out there” in the environment, we should measure the pollution inside people.

And so the Toxic Nation project was born. Coordinated by Environmental Defence, it campaigns to expose the dangers of pollution through testing Canadians and measuring the levels of toxic chemicals in their bodies.

So far the project has analysed the blood of disparate groups

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from politicians of all persuasions to Indigenous people and children.

“It doesn’t matter who you are or what you do for a living, how rich or poor you are, or if you eat organic granola every day of your life... we’re all polluted and have these measurable levels of chemicals in us,” says Smith.

Being able to measure the toxic chemicals in blood samples was one thing, but what Toxic Nation and the authors couldn’t do was clearly answer the first question everybody asked after getting the bad news about their contaminated blood: “How did these chemicals get into my body?” – followed by, “Are they doing any harm and how can I get rid of them?”.

While they knew chemicals such as brominated flame retardants (BFRs) and bisphenol-A (BPA) were commonly

found in products around the home, what they didn’t know was whether everyday exposure to these products could account for the levels they were finding in blood samples.

“One sort of dared the other,” Smith and Lourie say, pointing at each other. The plan for self-experimentation was born. Lourie’s apartment in downtown Toronto became their home for a week as they set about doing what millions of people are doing every day – cooking, eating, bathing, cleaning and hanging out. The cardinal rule established at the outset was that the experiments had to mimic real life.

In preparation for testing, the authors underwent a ‘detox’ from exposure to the chemicals involved for at least 48 hours, by avoiding all known contact with them. Being

aware of the dangers of these chemicals for some time, they had already been avoiding them where possible in their daily lives.

Blood and urine samples were taken before they started and during the week, as they tested for different chemicals. Seven chemicals were chosen, based on results from the Toxic Nation blood samples, and advice from chemical experts around the world (see *Seven Baddies*, page 92). “We went halves with the toxic chemicals and wrote those chapters in the book,” says Smith.

They set about finding everyday items known to contain the seven chemicals – phthalates, BFRs, mercury, BPA, triclosan, perfluorinated compounds (PFCs – “non-stick” chemicals) and the herbicide 2,4-D. Here are results from phthalates, triclosan and 2,4-D.



Triclosan is a chemical added to many everyday products such as toothpaste.

PHOTO: ISTOCKPHOTO/SEANSHOT



Bisphenol-A (BPA), one of the most common industrial chemicals, is still found in some baby bottles.

### Phthalates

Smith drew the phthalate straw. These are a class of chemicals used, among other things, to help body care lotions penetrate the skin and fragrances in products like shampoo to last longer, and as ‘plasticisers’ to keep substances such as vinyl soft.

This is where the rubber duck from their book title comes in. “Sometime in the 1970s the rubber duck and other allegedly ‘rubber’ toys actually ceased to be made out of rubber. So rubber ducks are actually vinyl ducks,” Smith says.

“Vinyl in its natural state is quite a rigid material, so if you want to make a vinyl duck soft, squeaky and lovable, you have to add phthalates to it. And if your kids are anything like mine, they chew on the vinyl duck and the phthalates are released into their mouth and start accumulating in their bodies.”

The rubber duck turned out to be the perfect symbol for this new kind of pollution.

“This is not pollution from obvious industrial sources, like a big, belching smoke stack or sewer pipes dumping into the ocean,” Smith says. “We’re talking about minuscule exposures to hundreds and thousands of pollutants every day that are in innocent-looking

items such as ‘rubber’ ducks. These chemicals rub off onto our hands, or we inhale them as we go about our daily activities.”

For the phthalates experiment, Smith used about half-a-dozen products containing phthalates over 48 hours and measured his blood levels of phthalates before and after.

“All I did was shampoo and condition my hair normally (and I don’t have a lot of hair, so it’s not a very lengthy activity), shaved normally, and used antiperspirant – and I got a 22 times increase in a chemical linked to breast cancer and testicular cancer in my urine.”<sup>3</sup>

### Triclosan

Perhaps the most startling result was for triclosan, the chemical added to many everyday products such as toothpaste, soaps and sponges that claim to be “antibacterial”.

According to Smith, “Triclosan is actually a registered pesticide that someone in the 1980s said, ‘Let’s put it in toothpaste’...”

In the book, Smith writes of his utter disbelief on discovering that even his garden hose was impregnated with triclosan: “Is there no corner of

our lives that hasn’t been invaded by chemical companies peddling their modern-day snake oil?” he asks.

For two days Smith used an antibacterial toothpaste, bath soap, dishwashing liquid, antiperspirant and shaving gel, all of which contained triclosan. His blood levels increased a whopping 2900 times.

“I think a large part of the increase came from the toothpaste, because you’re putting it in your mouth,” he says.

“Even the conservative American Medical Association has recently called for a household ban on triclosan because of concerns that it is leading to thyroid problems and is contributing to the development of ‘superbugs,’” Smith says.<sup>4</sup>

### 2,4-D

Another of the chemicals the authors chose to investigate was the controversial herbicide 2,4-D, widely used on lawns and crops. The idea was for Lourie to spray a lawn with 2,4-D and measure his blood levels before, during and after. But the experiment didn’t get off the ground – for good reasons.

They couldn’t experiment in Toronto because the city had, in 2004, banned the ‘cosmetic’ use of pesticides on lawns (for example, to kill harmless weeds for aesthetic reasons). So they looked to Ontario. But during the planning phase, Ontario, too, introduced a ban on all cosmetic uses of herbicides on lawns.

By this stage they were having second thoughts about the ethical implications of “deliberately poisoning someone else’s yard” and opted instead to do a test on Lourie’s blood for pesticide residues.

Despite his largely organic diet, Lourie had pesticide residues in his blood which were from the long-banned organochlorine group – lindane, DDT, chlordane, and HCB (hexachlorobenzene).

### Into the body

Lourie points out, “At first, product manufacturers and the chemical industry claimed the chemicals in their products ‘don’t get into our bodies.’

# SEVEN BADDIES

Phthalates are among several toxic chemicals found in many shampoos.



## 1 Phthalates

Phthalates are a class of more than a dozen commonly used chemicals. Smith and Lourie say that more than 8.1 billion kilograms of phthalates are produced each year globally. In excess of 60 per cent are used as softening agents in vinyl and polyvinyl chloride (PVC) products such as flooring, food wrap, cosmetics, children's toys and teething rings.

Diethyl phthalate (DEP), however, has become ubiquitous in personal care products, "allowing lotions to penetrate and soften the skin and help the fragrance in scented products last longer", the authors say. Shampoos and air fresheners are among the multitude of products DEP is found in.

Australia's federal regulator, National Industrial Chemicals Notification and Assessment Scheme (NICNAS) is assessing eight phthalates. An 'interim' 18-month ban is in place prohibiting the supply of certain plastic products such as toys and eating utensils for children under three containing more than 1% by weight of the most toxic phthalate, DEHP (Di-2-ethylhexyl phthalate).

## 2 Brominated flame retardants (BFRs)

Brominated flame-retardants (BFRs) are used in many products including electronics, white goods, car interiors, carpets and polyurethane foam in furniture and bedding. Australian Government studies reveal Australians have twice the level of some BFRs in their blood and breast milk compared to European counterparts, with the highest levels in children under four. Two of the most toxic BFRs were recently banned under the global Stockholm Convention on Persistent Organic Pollutants (POPs). Australia is yet to ratify and take action.

## 3 Perfluorochemicals (PFCs – includes "non-stick" chemicals)

Different perfluorochemicals are used in everyday products to create "non-stick", grease- and water-repellent qualities. Products include cookware, textiles, carpets, paints, electronics and medical equipment. Australian Government studies reveal Australians have more PFCs in their blood than Europeans. Only the US has higher levels. Perfluoro-octane sulfonate (PFOS) was listed as a POP under the Stockholm Convention. Most countries have adopted new listings of PFOS, but Australia is yet to ratify and take action. Perfluoro-octanoic acid (PFOA) is subject only to voluntary action in Australia.

## 4 Bisphenol-A (BPA)

Bisphenol-A (BPA) is one of the most commonly used industrial chemicals and is found in a wide variety of products including shatter-proof polycarbonates plastics in food and beverage containers, baby bottles, kitchen appliances, CDs, the epoxy linings of canned foods and tinned beverages, nail polishes and composite dental fillings. BPA has not been reviewed by NICNAS, but they maintain, along with the food authority FSANZ, that levels of exposure are low and there are no issues of concern. BPA has been found in the effluent of wastewater treatment plants flowing into

Australia waterways. Bans are in place in Canada, some US states and EU countries for its use in baby bottles.

## 5 Mercury

Mercury is still used in medical equipment and a fungicide used on sugarcane in Australia. Australia's coal-fired power stations emit tonnes of mercury each year. Negotiations for a United Nations Treaty on mercury start this year with the aim to ban the mining, trade and use of mercury and focus on clean-up of contaminated soils and safe storage of mercury stockpiles.

## 6 Triclosan

Triclosan is used in numerous products claiming to provide "antibacterial" protection, including toothpaste, soaps, paints, sponges and plastic goods. NICNAS has completed a review of triclosan but this assessment did not include triclosan imported as part of finished plastic and textile products. There are international concerns that triclosan is a hormone disrupter and is contributing to antibiotic resistance.

## 7 2,4-D

2,4-D is a herbicide designed to disrupt plant 'hormone' processes. There are 198 products with 2,4-D registered in Australia and it's used widely on a range of broad-leafed weeds in turf, forestry and on crops such as wheat, maize, oats, barley and sugarcane. It has been under review by the Australian Pesticides and Veterinary Medicines Authority (APVMA) since 1995 because of risks to the environment and impacts on public and occupational health. The APVMA is currently reconsidering approvals because of significant concerns about spray drift.

• Adapted from information by the National Toxics Network on persistent pollutants: [www.ntn.org.au](http://www.ntn.org.au)  
• For more details on the regulatory status of these chemicals, go to: [www.nicnas.gov.au](http://www.nicnas.gov.au) and [www.apvma.gov.au](http://www.apvma.gov.au)

“Now they say, ‘OK, they do, but only in small amounts, and they’re not doing any harm’.

“I think we’ve proven quite dramatically with our experiments that these chemicals do get into our bodies and the levels can escalate quickly. Overall the levels are small, in the parts per billion range, but what the latest research is actually showing us is that these chemicals can cause harm, even at these very small levels.

“Many of these chemicals disrupt hormones. It’s not so much the quantity of the chemical that’s being introduced into your body, it’s the timing of the chemical exposure that’s critical,” he continues.

Lourie says this is especially crucial for a developing child or foetus.

“There’s an epidemic of childhood health issues in industrialised countries with autism, ADHD, asthma and obesity on the rise. These are things that aren’t well explained in any other way because

they are much more prevalent in industrialised countries and have increased dramatically in the last decade,” Lourie concludes.

But the authors don’t like to end on a negative note. They are optimistic about the growing environmental health movement around the world, which is gaining momentum and influencing governments and change.

Another positive is that while our levels of toxic chemicals can skyrocket if we expose ourselves to products containing them, they can equally plummet if we choose our everyday products wisely. **OG**

• Jo Immig is an environmental scientist and coordinator of the National Toxics Network.

*Slow Death by Rubber Duck*, by Rick Smith and Bruce Lourie, is published by University of Queensland Press. Paperback is RRP\$34.95.



## References

- *Slow Death By Rubber Duck* is extensively referenced with peer-reviewed scientific studies, independent reports and articles; however, we’ve added some specific references of our own for this article.
- **1.** UN Stockholm Convention on POPs: <http://chm.pops.int/default.aspx>
- **2.** Find details of the REACH program at: [http://ec.europa.eu/environment/chemicals/reach/reach\\_intro.htm](http://ec.europa.eu/environment/chemicals/reach/reach_intro.htm)
- **3.** Soto AM; Sonnenschein C: Environmental causes of cancer: endocrine disruptors as carcinogens, *Nature Reviews Endocrinology*, 2010. See <http://www.nature.com/nrendo/journal/v6/n7/full/nrendo.2010.87.html>
- **4.** 2000 Annual Meeting of the AMA, Reports of the Council on Scientific Affairs. See <http://www.ama-assn.org/ama1/pub/upload/mm/443/csaa-00.pdf>
- **See also:** article on page 78 which refers to the US President’s Cancer Panel report *Reducing Environmental Cancer Risk*.