

# Causes of Cancer – Part III: What we've done to the Environment...

by Dr Stephen Hardy PhD.



In the first two articles of this series (1, 2) we discussed preventing 37,000 Australian cancer cases each year by addressing the following six lifestyle factors (3).

- Alcohol;
- Smoking;
- Poor Diet;
- Obesity;
- Lack of regular exercise; and
- Excessive exposure to UV light.

We also discussed the first of the causes of cancer listed by Professor Ian Frazer of the University of Queensland (4):

- 30% of cancer is caused by what we do to ourselves;
- 30% of cancer is caused by what we've done to the environment;
- 30% of cancer is caused by what you catch; and
- Only 5 – 10 % of cancers are genetic.

In this article we will look in more detail at the second: 30% of cancer is caused by what we've done to the environment.

Since the industrial revolution advances in physics, engineering, manufacturing, material science, electronics, mathematics, biology, medicine and particularly chemistry have changed our lives. While no-one would argue antibiotics, plastics, pharmaceuticals, industrial chemicals, pesticides and a host of other artificial chemicals have not brought advantages, at what cost have those advances come?

There are over 80,000 man-made chemicals in common use, with over 2,000 more added each year (5, 6). Produced in massive quantities and used so widely and pervasively, there is no way you can escape being exposed. They are in the air you breathe, the water you drink, the food you eat, the products you buy and out-gassing from your car and the buildings you live and work in. They have spread to every corner of the globe to contaminate the environment. Indeed, significant levels of artificial chemicals can be found in the Arctic and other remote locations and in native peoples living their traditional lives (11), while babies are arriving into the world "pre-polluted", with over 300 artificial chemicals found in umbilical cord blood (6, 7).

Despite their widespread use and global distribution, we only have reliable safety data for around 7% of these artificial chemicals and for over 40%, no data at all (5, 6). What this means is we really do not know whether they are safe or not.

Professor Frazer has proposed what we have done to the environment is responsible for 30 % of cancers. By far the vast majority of this environmental damage is chemical pollution, particularly artificial chemicals. This does not mean all these artificial chemicals cause cancer directly, although some do. They can also cause cancer by either interfering with the systems of the body that protect you from cancer, or by setting up conditions which encourage the development and growth of an existing cancer. For example, chemicals that interfere with your immune system or hormone system (endocrine disruptors), have the potential to influence and encourage the development and growth of cancerous cells.

There is a considerable and growing body of evidence that some of these artificial chemicals are far from benign. Indeed, history is awash with examples of chemicals in widespread use and thought to be safe but later shown to be dangerous: DDT and Poly-Chlorinated Biphenyls (PCB) to name just two.

There is not the time here to discuss specific chemicals, their interactions and behaviour nor their potential health effects. Suffice to say, the list is large and growing (12, 13).

We could also discuss what governments can do to protect us through improving the legislation around the registration and use of these chemicals. While important, this would only be picking at the edges however. The reality is the choices you make every day have by far the greatest influence on the amount and type of potentially harmful chemicals you are exposed to.

Seeing we know so little about the long-term safety of many of these artificial chemicals, it is wise to live by the practical embodiment of the precautionary principle: "Better safe than sorry". The same caution goes for natural chemicals too. Natural doesn't automatically mean safe: Arsenic is natural; Alcohol is natural; Asbestos is natural. Yet all are known carcinogens. When it comes to chemical exposure, don't volunteer to be a victim.

For example: Every year the Environmental Working Group (EWG) ([www.ewg.org](http://www.ewg.org)) publishes the "Dirty Dozen" – a list of 12 common foods most heavily contaminated with pesticides (8). According to the EWG, avoiding the most contaminated fruits and vegetables and eating the cleanest (9) can reduce your pesticide exposure by up to 80 %. (Please refer to our article 'Who are the Dirty Dozen and Clean Fifteen' on page 11 of this edition.)

So where are these chemicals and how do you assess your risk? A sobering exercise to demonstrate how many chemicals you are exposed to daily is to write every chemical you come in contact with through the day on a notepad. What would this list look like?

Soap, Shampoo, Conditioner, Deodorant, Talcum Powder, Toothpaste, Moisturiser, Foundation, Sunscreen, Make Up, Eyeliner, Lip Gloss, Mousse, Hairspray, Perfume.

And that's before you've left the bathroom. It is not uncommon for the list to run to several pages by the end of the day.

The cumulative effects of these daily chemical exposures can be profound. Some estimates put the amount of artificial chemicals absorbed during a lifetime as high as 35 kg for men – almost half the average body weight and 120 kg for women – nearly twice their average body weight (10). Why is a woman's lifetime exposure so high compared to men? Because women, by choice, expose themselves to more chemicals.

So where do you start and what do you do to protect yourself and your loved ones? The first step is to identify the risk by preparing your list of daily chemical exposure, both at home and at work. Become aware of the chemicals in your food; under your kitchen and laundry sink; in your bathroom; medicine cabinet; garden shed; around your home and your workplace. Once you have your list, become an intelligent consumer and ask yourself, honestly, why you are using the chemicals.

Do you really need them? What can you do without? What could be done to minimise your exposure? Is there protective clothing and equipment you could use or implement a change in workflow to minimise your exposure? And of the chemicals that remain, are there safer or healthier alternatives? What cosmetics or personal care products? What cleaning agents? What type of paints and materials? What sprays are you using in the garden? Are you eating foods grown organically, or without the use of pesticides, or grown in a country with stringent safety standards? What about the packaging? Are there other ways of living or working?

The questions you ask, and the honesty of the answers, can have a dramatic effect on your chemical exposure, the potential damage they may do and the load they place on your body. It is also prudent to remember the object of the exercise is to reduce your total exposure to all chemicals, both natural and artificial, not just substitute one for another.

## In the next article we'll look at the third cause of cancer: The things you catch.



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### References and Suggested Reading

1. Hardy, S. J.: *Causes of Cancer: Everything Old Is New Again*. *Healthy Living*, January – March 2016, pages 6 – 7. Available online at: <http://drstephenhardy.com/wp-content/uploads/2016/03/Hardy-Causes-of-Cancer-1-Healthy-Living-January-March-2016-Pages-6-7.pdf>
2. Hardy, S. J.: *Causes of Cancer Part 2: What we do to ourselves*. *Healthy Living*, April – June 2016, pages 8 – 9. Available online at: <http://drstephenhardy.com/wp-content/uploads/2016/04/Hardy-Causes-of-Cancer-2-Healthy-Living-April-June-2016-Pages-8-9.pdf>

3. Whiteman, D. C.; Webb, P. M.; Green, A. C.; Neale, R. E.; Fritschi, L.; Bain, C. J.; Parkin, D. M.; Wilson, L. F.; Olsen, C. M.; Nagle, C. M.; Pandeya, N.; Jordan, S. J.; Antonsson, A.; Kendall, B. J.; Hughes, M. C. B.; Ibiebele, T. I.; Miura, K.; Peters, S.; Carey R. N.: *Cancers in Australia in 2010 attributable to modifiable factors: Introduction and overview*. *Aust NZ J Public Health*; 39:403 – 407, 2015; doi: 10.1111/1753-6405.12468. Available at: <http://onlinelibrary.wiley.com/doi/10.1111/1753-6405.12468/epdf>

4. Frazer, I: *Florey lecture to the University of Adelaide, September 2013*: Available at: <https://www.youtube.com/watch?v=q1Qg-iHhSto>

5. Bennett M, Davis B J (2002) *The identification of mammary carcinogens in rodent bioassays; Environ Mol Mutagenesis*, 39:150-157. Abstract available online at: <https://www.ncbi.nlm.nih.gov/pubmed/11921183>

6. *Preventable cancer in the USA*. *The Lancet*, 375 (May 15): 1665, 2010. Available online at: [http://www.thelancet.com/pdfs/journals/lanct/PIIS0140-6736\(10\)60718-0.pdf](http://www.thelancet.com/pdfs/journals/lanct/PIIS0140-6736(10)60718-0.pdf)

7. *A Present for Life: Hazardous chemicals in umbilical cord blood*. Greenpeace and World Wildlife Fund (WWF), 2005. Available online at: <http://www.greenpeace.org/international/Global/international/planet-2/report/2005/9/man-made-chemicals-in-maternal.pdf>

8. Environmental Working Group (EWG): 'Dirty Dozen': [https://www.ewg.org/foodnews/dirty\\_dozen\\_list.php](https://www.ewg.org/foodnews/dirty_dozen_list.php)

9. Environmental Working Group (EWG): 'Clean Fifteen': [https://www.ewg.org/foodnews/clean\\_fifteen\\_list.php](https://www.ewg.org/foodnews/clean_fifteen_list.php)

10. Asante-Duah, D. K. *Public health risk assessment for human exposure to chemicals (Environmental Pollution Volume 6)*, Springer, London, 2002 and references therein.

11. US Environmental Protection Agency (EPA): *Persistent Organic Pollutants: A Global Issue*, A Global Response: <https://www.epa.gov/international-cooperation/persistent-organic-pollutants-global-issue-global-response>

12. Poulos, A.: "The Silent Threat". *Promoting Good Health*, 2005. Available online at: <http://www.promotinggoodhealth.com/shop/the-silent-threat/>

13. Smith R. and Lourie, B.: "Slow Death By Rubber Duck", 2009. University of Queensland Press, St Lucia, Queensland, Australia.

