

## **Scientists are mired in a bogus safety culture that stifles innovation, acts as a brake on economic growth and actually makes the world a more hazardous place**

Until recently much prosperity flowed from new developments in chemistry and electronics that exploit the outer part of atoms. Only medicine has whole-heartedly engaged with the inner nuclear part. Following the work of Marie Curie the health of people around the world today has improved out of all recognition thanks to radiation and nuclear technology.

Unfortunately many people -- politicians, the media, the wider public, even many scientists -- believe that this same technology used in other contexts is dangerous; the reasons for this are historical and cultural without any basis in science. This belief should be challenged and we should examine the evidence, based on simple ideas, personal experience and the published results of nuclear accidents.

We accept the ultraviolet radiation in sunshine even though it comes from a nuclear reactor and causes skin cancer (9000 deaths a year in USA). We have learnt to enjoy vacations in the sun, to use sun block - and that is sensible. By contrast, the closely related nuclear radiation from the accident at Fukushima (damaged in the 2011 Japanese tsunami) has killed nobody and the intensities are so low that no case of cancer is likely in the next 50 years. Yet the authorities have reacted to it in a way that will reduce economic output and increase damage to the environment.

Much is known about nuclear radiation -- for instance from what happened in the Goiania Accident in 1987. There some adults and children got hold of a discarded radiotherapy source, broke it open and gave themselves large internal radiation doses. Within six weeks four were dead; the lowest dose measured for any casualty was between 1,000 to 10,000 times higher than the largest dose recorded for anyone in an extensive published survey of affected residents after the Fukushima accident.

In the 25 years since 1987 there have been zero cancers from radiation among the 249 people affected at Goiania. Two healthy babies were born, one to a mother amongst the most highly contaminated. However fear of the contamination has been the cause of severe stress and depression. Similar problems with social and mental health have been reported as widespread at Chernobyl and Fukushima, often with fatal results particularly where the elderly have been evacuated.

Modern scientific experiments establish beyond doubt that moderate doses of radiation do no harm. Biologists have learnt how in a billion years life has evolved defences against such attacks and even benefits from modest stimulation of these defences by low chronic doses.

So why are official attitudes and regulations so dangerously inappropriate? They cause serious social harm and benefit nobody – and by closing nuclear power plants they have caused major damage to the environment and the world economy.

The fear of a nuclear holocaust at the time of the Cold War spawned many committees, national and international, who still offer advice to governments to regulate any exposure to radiation to levels “As Low As Reasonably Achievable”. This is about 1000 times lower than a level that would be “As High As Relatively Safe” -- which, after all, is the way that the safety of a bridge or ship might be assessed.

Unwarranted safety is expensive and intimidating. These overlapping committees, should be reduced and should re-dedicate themselves to dispensing explanatory education and improved public trust in science. Only then may the known benefits of nuclear technology (access to clean power, clean water, food preservation, as well as advances in healthcare) be widely accepted and realised. Those countries that first break the mould and start fully exploiting this technology will have a great economic advantage – and they will be safe too.

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