

# Myths and Reality about Risks Related to Radiation Exposure

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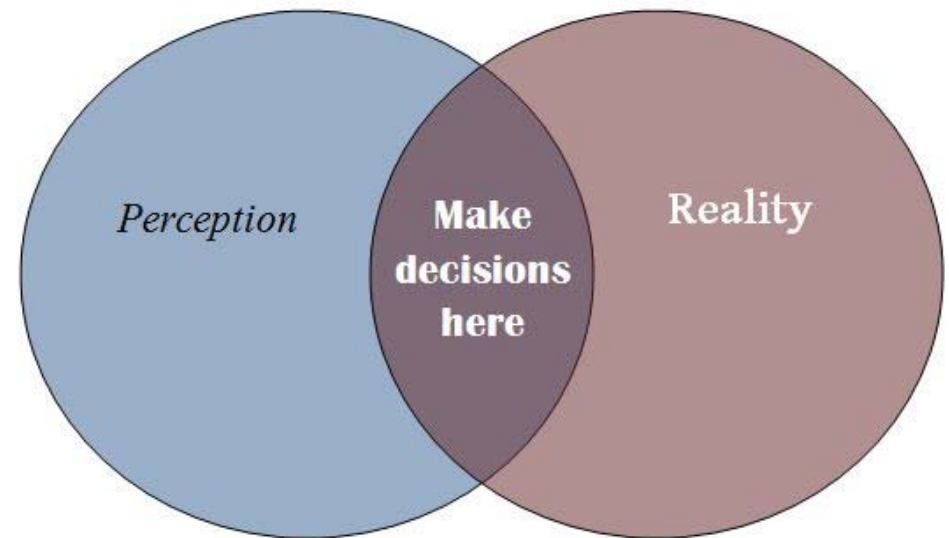
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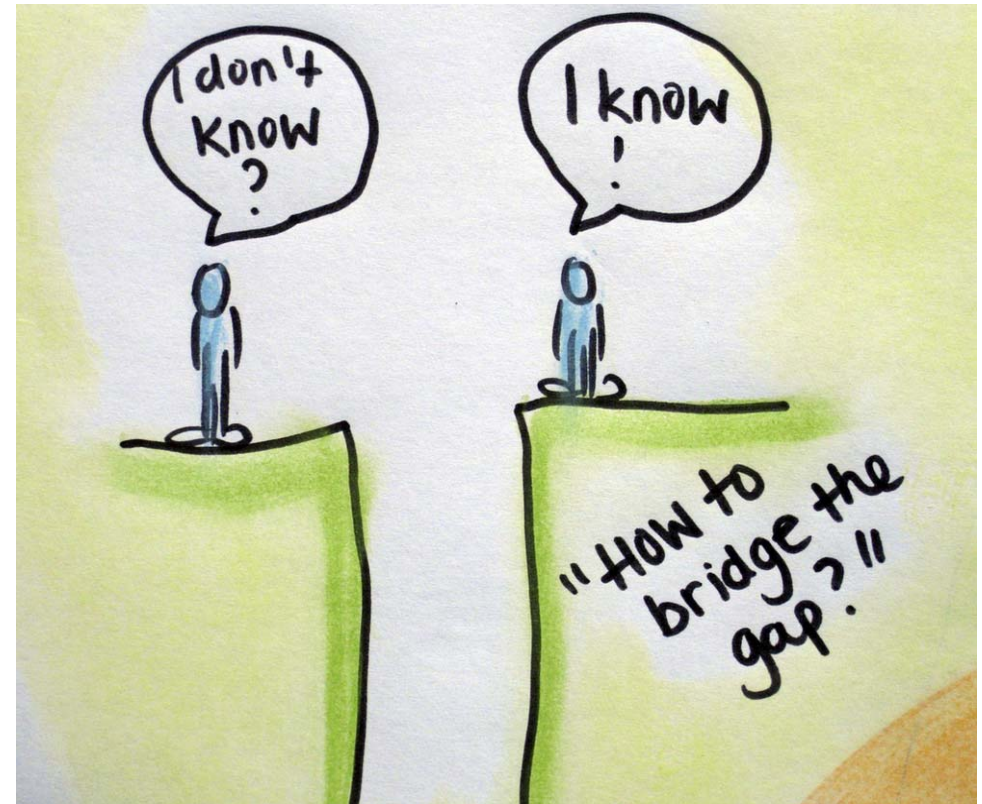
# Myths & Reality

- Provocative question: what is reality?
- „Perception is Reality“ (Is it?)
- Myths vs. Reality = Stories vs. Fact/Knowledge/Science
- Interception: perception
- Radiation perception gap



# Gap – how to react to it (what to do)?

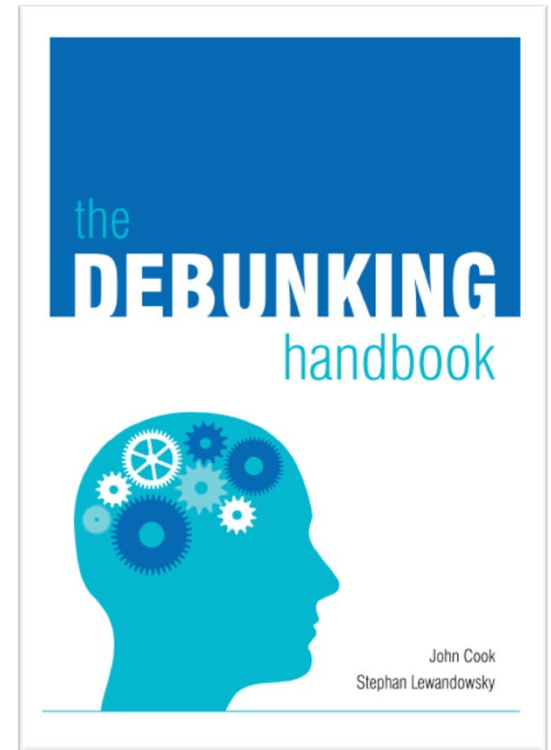
- Scientific frustration
- Experts - personal experience
  - Experts as “responsible” citizens
  - Radiation stigma
- Need (or even urge) to act
- How to act?
  - More information?
  - More knowledge?
  - Raise awareness?
  - More channels?



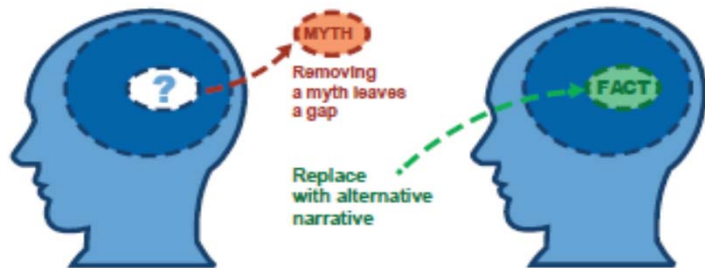
# Myths are hard to debunk!

## But...

- Debunking methodology exists:
  - How to react to myths?
  - How to avoid back-fire effect (i.e. reinforcing the myth)?
  - How to fill the gap generated by removing a myth?
  - Anatomy of an effective debunking



[http://www.skepticalscience.com/docs/Debunking\\_Handbook.pdf](http://www.skepticalscience.com/docs/Debunking_Handbook.pdf)



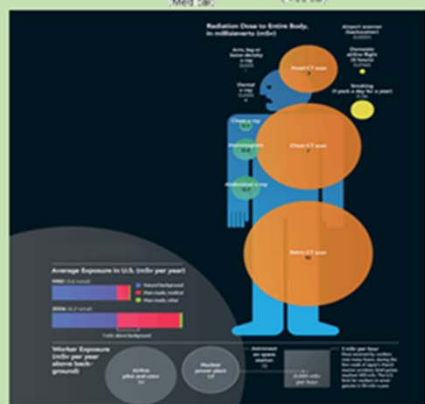
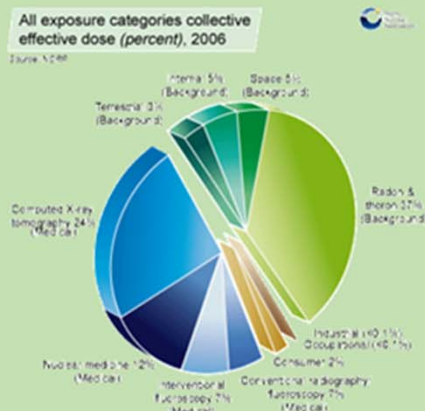
**Example of debunking a climate myth**

<b>Sun and climate are going in opposite directions</b>	• Core fact emphasised in headline
Over the last few decades of global warming, the sun has shown a slight cooling trend. Sun and climate are going in opposite directions. This has led a number of scientists to independently conclude that the sun cannot be the cause of recent global warming.	• Core facts reinforced in initial text
One of the most common and persistent climate myths is that the sun is the cause of global warming.	• Myth
This myth cherry picks the data - showing past periods when sun and climate move together but ignoring the last few decades when the two diverge.	• Explaining how the myth misleads (alternative explanation, see Page 5)

**Radiation and radioactive material is part of nature and medicine: less than 2% of all ionising radiation in our everyday life comes from industrial or other non-medical sources.**

The largest part (normally more than 50%) of all ionising radiation in our everyday life comes from natural sources. Among them, radon is the largest source. It is a radioactive material (gas) that is present in the air.

The remaining smaller part comes from man-made, artificial sources. Among them, medical sources (e.g. medical x-rays and nuclear medicine) present the biggest chunk.



Core fact

Opening paragraph

Infographic

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However, there is a lot of misunderstanding surrounding perception of radiation among different stakeholders which results in scientifically unfounded fear of radiation. People perceive different types of radiation risks in very different ways. Public opinion surveys show that people perceive nuclear power and nuclear waste as presenting a disproportionately high risk, but perceive other sources of radioactivity - such as naturally occurring radon gas and medical x-rays - as posing much lower risk than they actually are, if certain measures not taken.

For example, many people believe that population around nuclear power plants receive higher doses than the rest of the population and that this causes cancer and other harmful effects.

However, after more than a half-century of radiological monitoring and medical research, there is no evidence linking normally operating nuclear power plants to negative effects on the health of the public or workers. In comparison to other energy sources and electricity generating technologies, nuclear power has one of the best safety records, including radiation safety.

Even in the near vicinity of nuclear power plant less than 0.01% of the average yearly radiation dose comes from nuclear power. This is 100 times less than we get from coal, 200 times less than a flight from Europe to USA, and about the same as eating 1 banana per year.

Explicit warning

Myth

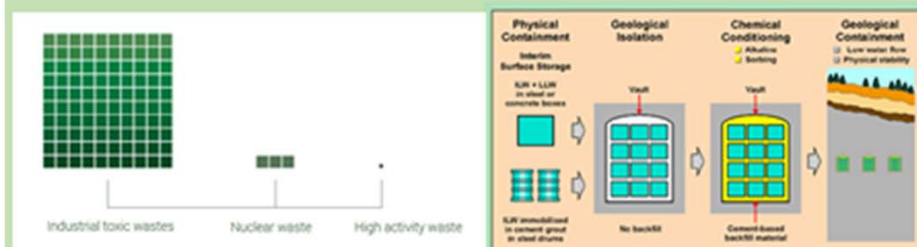
Gap-filling explanation

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**Radioactive waste and used nuclear fuel are being safely managed. The amount of this waste is small in comparison to other types of waste.**

Today, safe management practices are implemented or planned for all categories of radioactive waste. Low-level waste (LLW) and most intermediate-level waste (ILW), which make up most of the volume of radioactive waste products (= 97%), are being disposed of securely in near-surface repositories in many countries so as to cause no harm or risk to health and environment in the long-term. The management practice for LILW (low- and intermediate level waste) has been carried out for many years in many countries as a matter of routine.



One of the key features of LILW management is isolating radioactive waste deep inside a suitable rock or other material to ensure that no harmful quantities of radioactivity ever reach the surface environment.

This is achieved through the use of multiple (natural and engineered) barriers that work together to provide protection over hundreds of thousands of years.

Beside the technical solutions for radioactive waste management, the amounts of radioactive waste are small, in comparison to the amounts of other waste types. If we take a look at the yearly amount of waste in Slovenia, we can see that from the 4.5 million tons of all waste types only 3% (120.000 tons) is dangerous waste. And from this 3% only 0,04% (i.e. 50 tons) is radioactive waste, including used nuclear fuel.

Core fact

# about radioactive waste.

Opening paragraph

However, those who are not familiar with facts regarding safe management of radioactive waste are often afraid of its impacts on health and environment.

Explicit warning

Some people feel that the nuclear industry has no solution for its radioactive waste and that radioactive waste is posing an immediate and acute danger to the environment. They believe that radioactive waste disposals are not safe because they emit dangerous amounts of radiation and that there is no solution for huge amounts of nuclear waste being generated.

Myth

Infographic

However, radioactive waste from nuclear plants is highly regulated, strictly controlled and monitored. No member of the public has ever been harmed by the handling, transportation, storage or disposal of any of the radioactive material from the nuclear power plants.

Gap-filling explanation

# Conclusions: 3 take-home messages

- Radiation perception gap exists. > We need more knowledge!
- Debunking methodology is available. > Let's use it effectively!
- Radiation and nuclear myths debunking should be applied to radiation/nuclear communications in general, i. a.:
  - emphasize core scientific facts, promote science and technology,
  - use reader/viewer friendly formats, combine facts and design,
  - myths are only part of the story (deal with them but don't focus too much).

# Public acceptance of new technologies: fear or understand?



The final confrontation with the Environmental Anti Fire Party,  
perhaps 25,000 BC

