

Radiation: Safety and Risk

We constantly live in a natural radiation environment, the eco radiation. In this kind of environment humankind has evolved and it reasonable to assume that we are made for living here. Slightly increased doses also have no detrimental effects, however when the radiation doses reach high levels damage to us can occur.

Is radiation natural?

There are many sources of radiation on Earth. Radiation comes from natural sources like minerals and gases, from space (cosmic radiation) and from human activities.

We all are exposed to low levels of radiation throughout our lives.

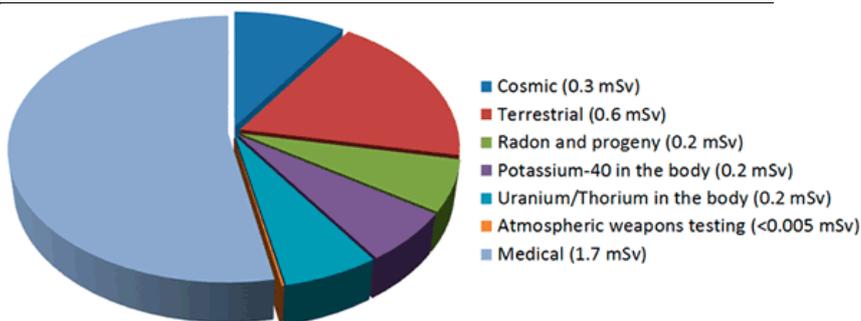
Data collated by the Australian Radiation Protection and Nuclear Safety Agency shows that the typical Australian receives 3 mSv per year of radiation exposure. Half of this is linked to healthcare, including dental X-rays, CT scans and other diagnostic procedures (see Figure below). Countries with a recognized longevity such as Sweden has an annual average natural background dose of about 5-8 mSv

What is radiation?

Radiation is energy that travels through space.

Uranium is known as a radioactive material because it naturally breaks down to release radiation. Uranium breakdown also releases the radioactive gas radon.

Other radioactive materials include, but not limited to thorium, radon and a form of potassium.



Source of radiation exposure in Australians

Which careers heighten radiation exposure?

The typical Australian uranium mine worker receives an additional 1 mSv per year of radiation exposure.

Flight crews receive an extra estimated 2 mSv per year due to heightened exposure to cosmic radiation.

Why should we minimise radiation exposure if possible?

Scientific studies report no direct evidence of health effects for annual radiation doses up to more than 100 mSv (natural background in some places with no health effects range over 200 mSv). Beyond this limit, the threshold at which radiation exposure starts to cause health problems such as cancer is not yet well understood.

The linear no-threshold hypothesis suggests that any amount of radiation, no matter how small, may result in cancer. However the few scientific studies that have been carried out challenge the validity of this hypothesis. The fact that human kind evolved during higher radiation doses adds to the credibility of these later findings showing that the linear dose hypothesis is flawed.

How is radiation exposure measured?

The unit for measuring radiation exposure is the Sievert, often used in the form of the milliSievert (mSv).

At high to very high radiation exposure levels (500-10,000 mSv) serious health problems and death result.

At low exposure (10-20mSv and below), no discernable effects are seen.

Australians are exposed to around 3mSv of radiation per year through normal life.