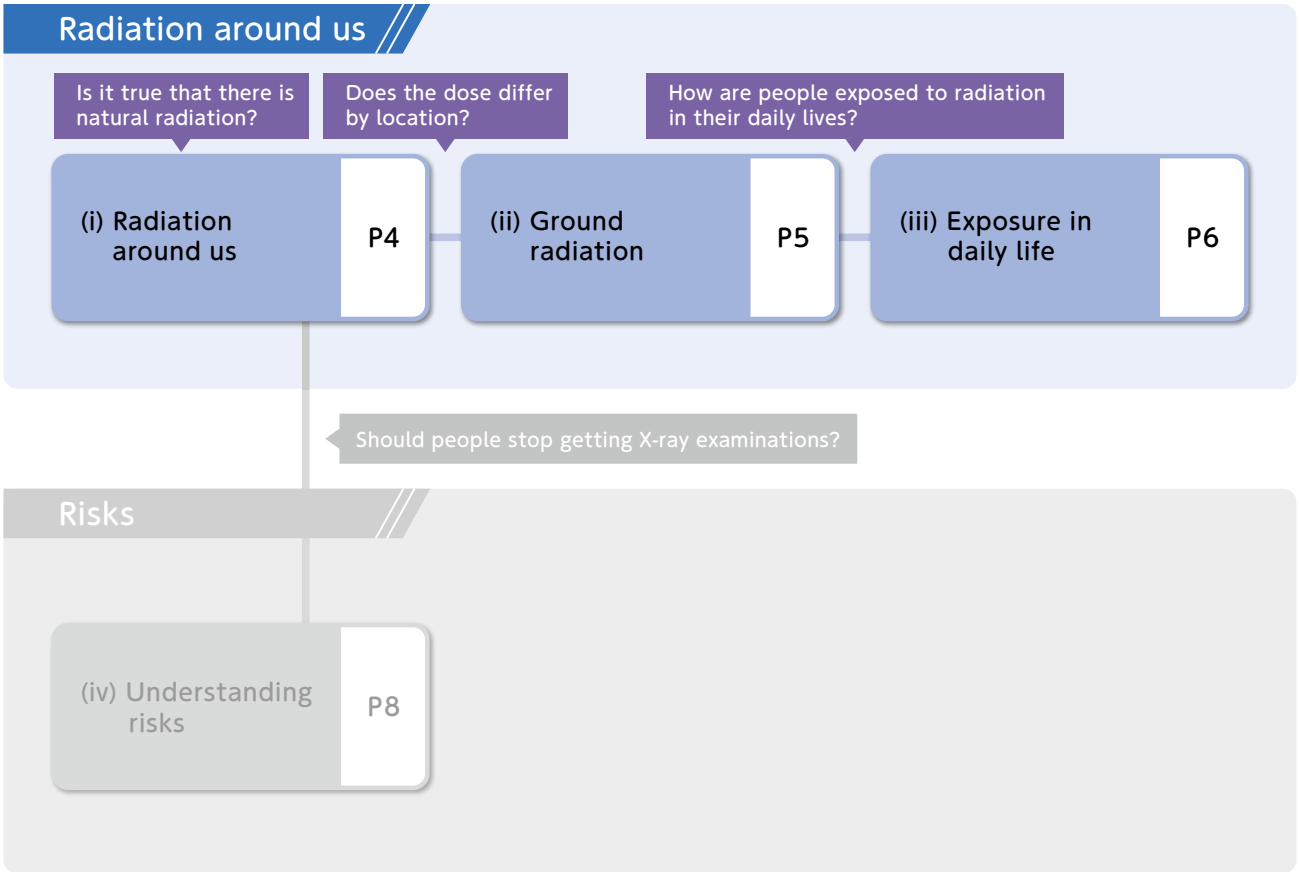
Health Effects of Radiation: 5 Themes | Radiation Around Us

Theme: Radiation around us

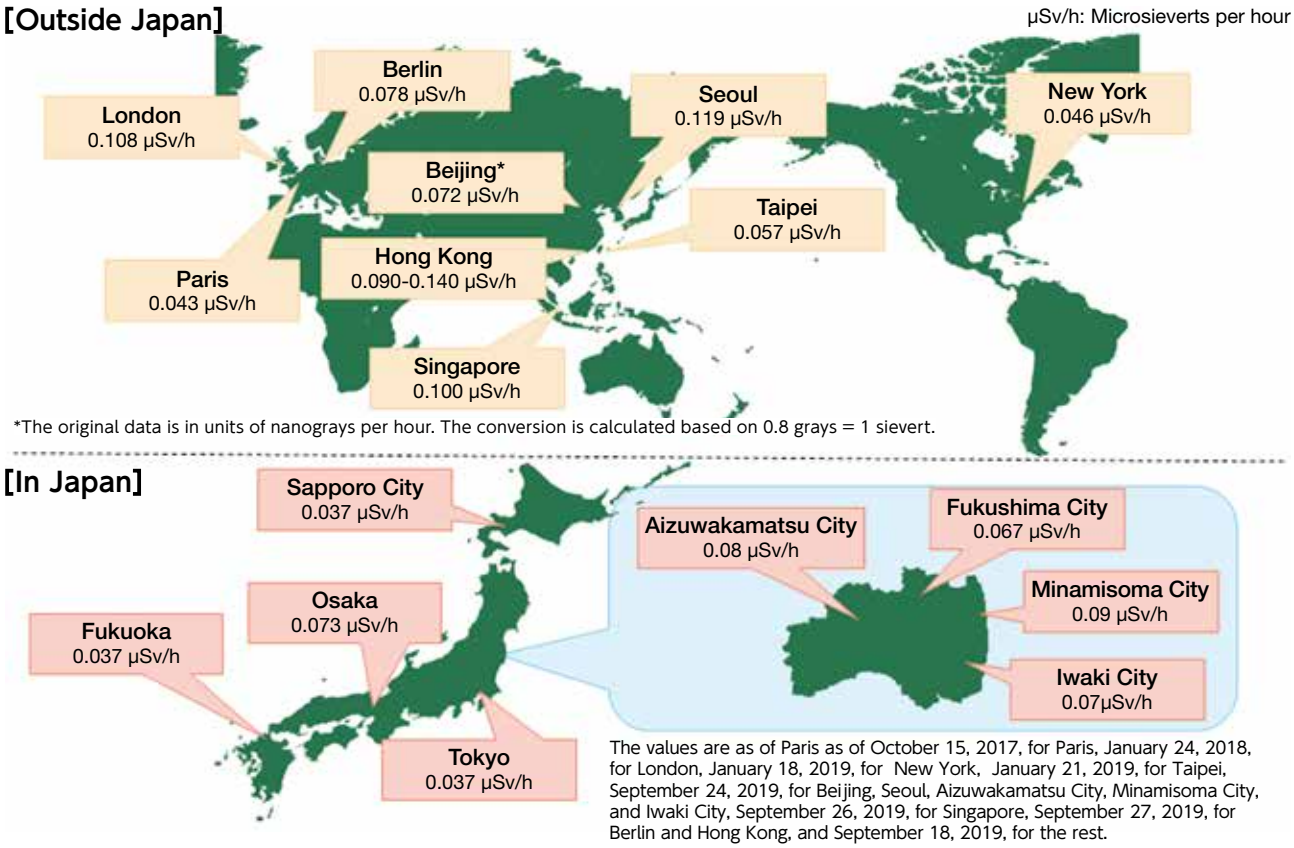
Radiation is invisible to the eye, and it has no smell, so it's hard to get a sense of it, but it exists all around us. In this section, you can learn about radiation doses in Japan and other parts of the world, as well as exposure doses in daily life.



(i) Radiation around us

We are exposed to radiation in our daily lives without realizing it. In addition, there are natural radioactive materials contained in the human body and common foods.

◉ Measurement results for ambient dose rates in major cities



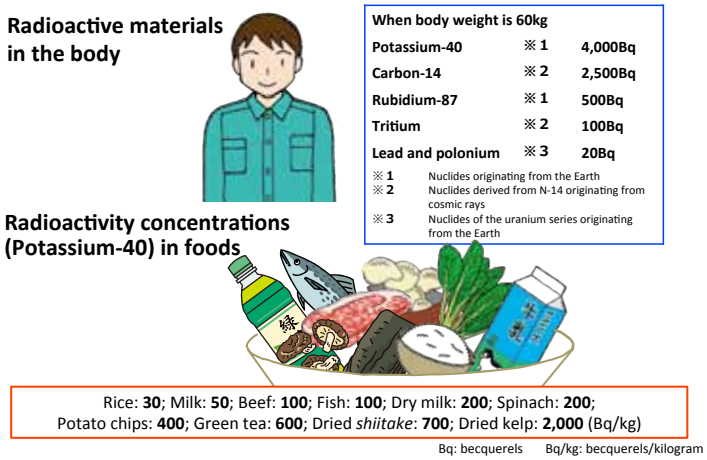
The values are as of Paris as of October 15, 2017, for Paris, January 24, 2018, for London, January 18, 2019, for New York, January 21, 2019, for Taipei, September 24, 2019, for Beijing, Seoul, Aizuwakamatsu City, Minamisoma City, and Iwaki City, September 26, 2019, for Singapore, September 27, 2019, for Berlin and Hong Kong, and September 18, 2019, for the rest.

Source: Prepared based on data by the Japan National Tourism Organization (https://www.japan.travel/en/news/post-2011-3-11-general-information/, as of December 2018)

This figure shows ambient dose rate measurements for major cities in Japan and other parts of the world in 2017 or 2018. Radiation dose can be seen to vary by region. This is due to variations in the amount of ground radiation, mainly caused by differences in soil and rock composition.

For more information about ambient dose rate measurement results for major cities, see page 69 of Vol. 1, FY2022 edition.

◉ Natural radioactive materials in the human body and foods



As shown in the figure to the left, the human body and common foods contain radioactive materials. Potassium is an essential element for life, and because 0.01% of potassium is radioactive, most foods contain radioactive potassium. Radioactive potassium emits β-particles and γ-rays, causing internal exposure from food intake. The internal potassium concentration is held constant, so exposure doses from potassium in foods depend on individuals' physiques and are considered unaffected by diet.

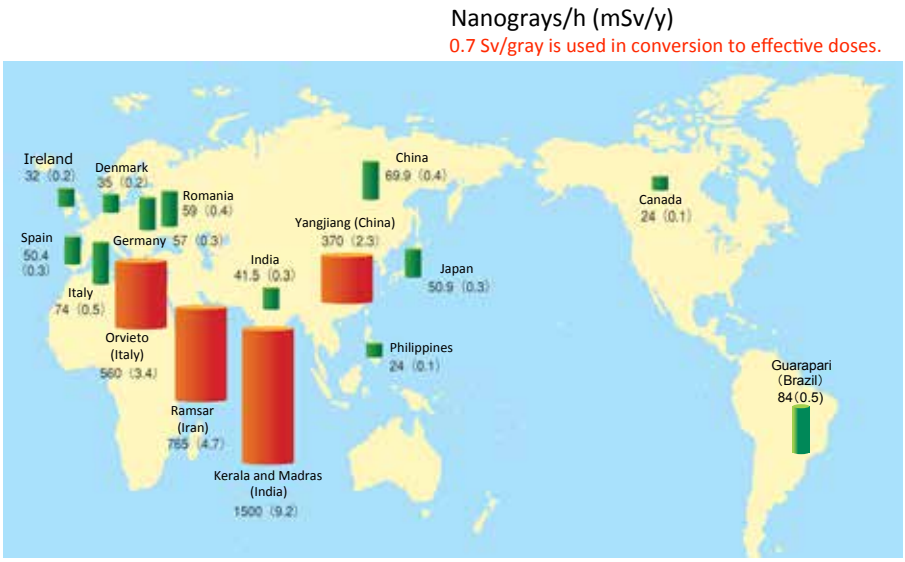
For more information about natural radioactive materials, see page 73 of Vol. 1, FY2022 edition.

Source: Prepared based on "Research on Data about Living Environment Radiation (1983)," Nuclear Safety Research Association

(ii) Ground radiation

The radiation dose is known to vary between areas as a result of variations in soil and rock composition.
Upon closer inspection, there are major differences in these radiation levels worldwide, and regional differences within Japan as well. In addition, no health effects caused by these differences have been reported.

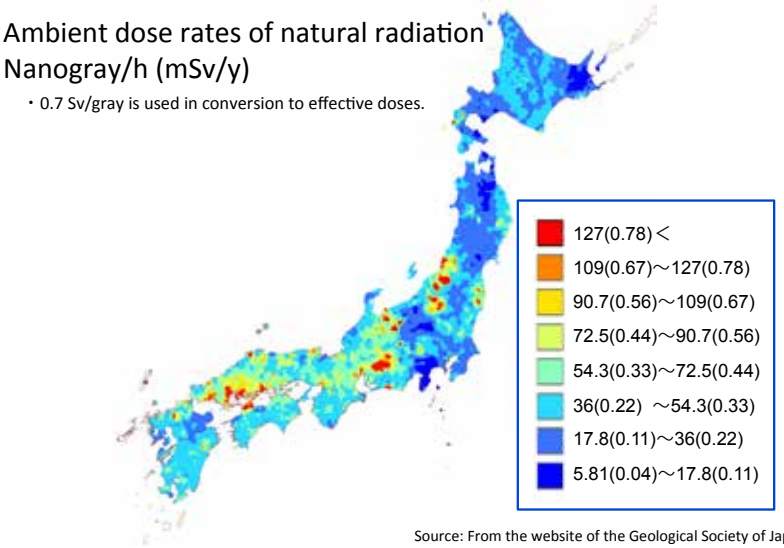
◉ Ground radiation



Sources: Prepared based on the 2008 UNSCEAR (United Nations Scientific Committee on the Effects of Atomic Radiation) Report and "Environmental Radiation in Daily Life (Calculation of National Doses), ver. 3" (2020), Nuclear Safety Research Association

There are regions around the world where natural radiation is seven to 30 times higher than in Japan, such as Yangjiang in China, Kerala in India, and Ramsar in Iran. The high levels of natural radiation in these regions are due to the fact that soil there is rich in radioactive materials such as radium, thorium and uranium.

For more information about ground radiation around the world, see page 67 of Vol. 1, FY2022 edition.



Source: From the website of the Geological Society of Japan

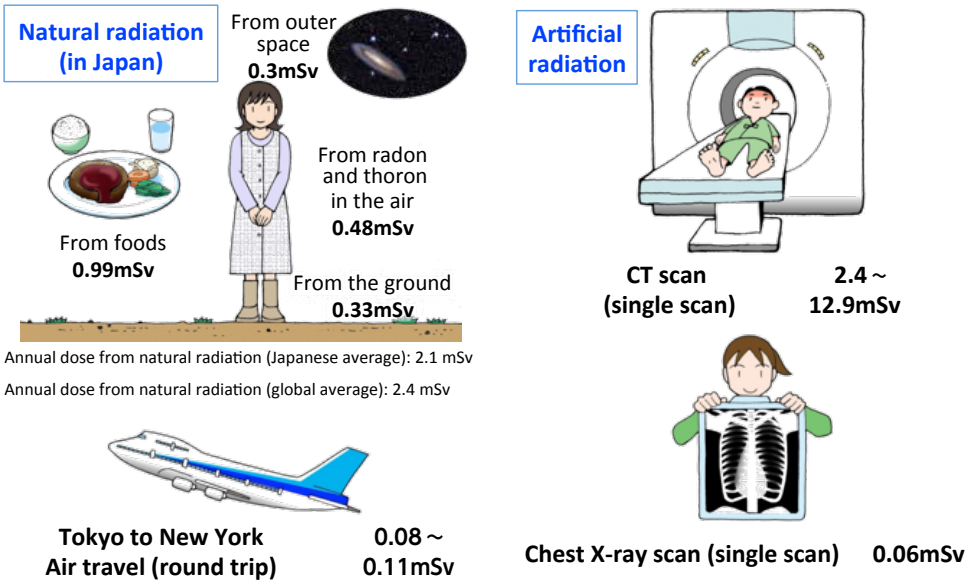
In Japan, like everywhere else, the amount of ground radiation varies from area to area. Comparison of ambient dose rates among different prefectures shows that there is a difference of 0.4 mSv per year between Gifu, where the ambient dose rates are highest, and Kanagawa, where the values are lowest.

For more information about ground radiation in Japan, see page 68 of Vol. 1, FY2022 edition.

(iii) Exposure in daily life

We are exposed to radiation from not only the ground but also other parts of our surroundings. This includes both natural radiation from the ground and foods and artificial radiation from CT scans and other medical examinations.

◉ Natural and artificial radiation exposure dose



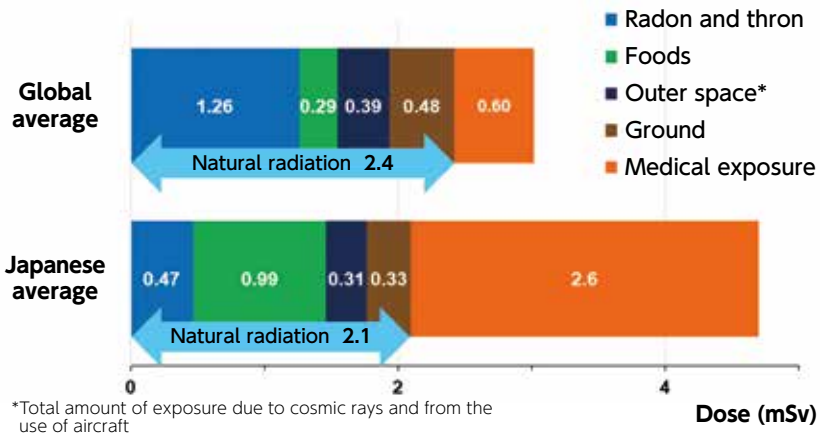
mSv: millisieverts

We are exposed to radiation in our daily lives without realizing it, and it's impossible to eliminate this exposure completely.

Sources: Prepared based on the 2008 UNSCEAR (United Nations Scientific Committee on the Effects of Atomic Radiation) Report; "Environmental Radiation in Daily Life (Calculation of National Doses), ver. 3" (2020), Nuclear Safety Research Association; and ICRP (International Commission on Radiological Protection) 103, etc.

For more information about radiation around us, see page 63 of Vol. 1, FY2022 edition.

◉ Exposure dose in daily life (per year)



*Total amount of exposure due to cosmic rays and from the use of aircraft

The percentage of medical exposure from radiological examinations is known to be high in Japan. This is considered to be because CT scans, which involve high-dose exposures for each examination, are quite common and upper gastrointestinal (UGI) examinations are generally utilized for stomach cancer screenings.

Sources: Prepared based on the 2008 UNSCEAR (United Nations Scientific Committee on the Effects of Atomic Radiation) Report; and "Environmental Radiation in Daily Life (Calculation of National Doses), ver. 3" (2020), Nuclear Safety Research Association.

For more information about exposure in daily life, see page 65 of Vol. 1, FY2022 edition.