

Cosmic and solar radiation: the basics

Cosmic radiation is the term used to describe the radiation that reaches us from other stars. Solar radiation is the term used to describe the radiation from our sun. Exposure to these forms of radiation is not much of an issue on the surface of the earth because the atmosphere serves as a protective layer. But when you are traveling at altitude, you have less of that protective layer above you and so your exposure to the radiation is higher.

There are four factors that will affect your dose: (1) latitude; (2) altitude; (3) time spent in flight; and (4) solar activity. There are three types of health risks associated with in-flight exposure to cosmic and solar radiation: (1) cancer; (2) genetic damage that might get passed on to a future baby (by men and women); and (3) damage to the fetus.

The activity of our own sun cycles and it usually peaks every 11 years. The last peak was in 2000-2001. However, there was a rash of solar storms in Oct–Nov 2003 that included the strongest on record, during which the levels of solar radiation increased by 1000 times in a matter of hours. Exposure during each hour of flight during those storms was equivalent to having two to three chest X-rays. This is a real concern for pregnant women. The airlines should post warnings and allow pregnant women to postpone or cancel their trips without penalty or discipline. Currently, there are no such requirements.

Unlike in Europe, there are no radiation protections for crewmembers to inform them of the possible health risks, monitor their estimated on-the-job radiation dose, or offer options during pregnancy. Information is provided here so that crewmembers can at least make an educated decision as to what level of risk is acceptable.