

With a thousand-fold rise in commercial airline flights over the North Pole in the last 10 years, exposure to radiation has become a serious concern.

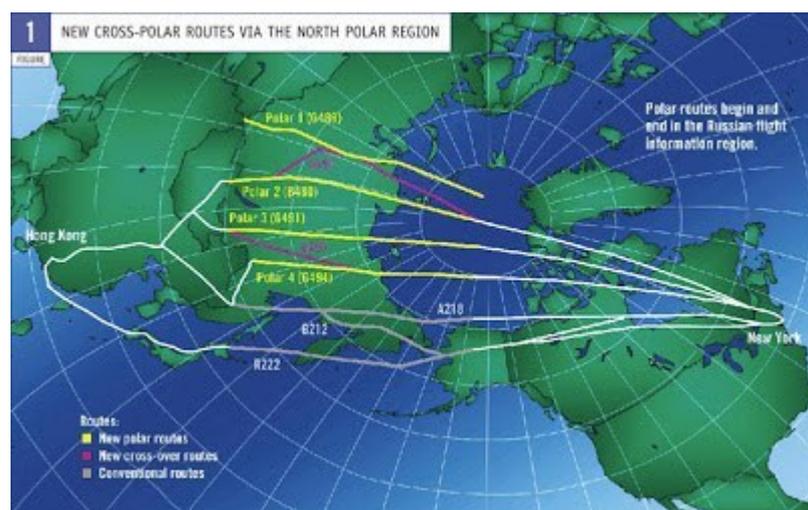
This health news is fact checked.

- **Flying an Airplane for an Hour Exposes Pilots to as Much Radiation as a Tanning Bed.**
- **Almost an Hour of Flying Equals 20 Minutes of Tanning**
- **Strong Link Between UV Rays and Melanoma**
- **Melanoma rates have jumped for young women by 800% in USA**

People who work on commercial airline flights are technically listed as “radiation workers” by the federal government - a classification that includes nuclear plant workers and X-ray technicians.

Exposure to radiation has been shown to increase health risk, according to numerous studies. Space radiation on the ground is very low, but increases significantly with altitude. At 30,000 to 40,000 feet, the typical altitude of a jetliner, exposure on a typical flight is still considered safe - less than a chest X-ray.

Exposure is considerably higher, however, over the Earth's poles, where the planet's magnetic field no longer provides any shielding. **And with a thousand-fold rise in commercial airline flights over the North Pole in the last 10 years, exposure to radiation has become a serious concern.**(<https://www.nasa.gov/centers/langley/science/polar-radiation.html>)



[FAA Advisory circular AC No: 120-61B](#) gives the guidance material on exposure to radiation. Whereas USA federal government categorize crew members as radiation workers, other countries including India does not do the same. The exposure limits are the same as those in the FAA advisory circular. [The Indian Atomic Energy Regulation Board](#) limits are given below.

DGCA India recently put out an [Operations circular 2/2019](#) based on the FAA AC.

Dose Limitations		
Part of the body	Occupational Exposure	Public Exposure
Whole body (Effective dose)	20 mSv/year averaged over 5 consecutive years; 30 mSv in any single year	1 mSv/y
Lens of eyes (Equivalent dose)	150 mSv in a year	15 mSv/y
Skin (Equivalent dose)	500 mSv in a year	50 mSv/y
Extremities (Hands and Feet) Equivalent dose	500 mSv in a year	-

For pregnant radiation workers, after declaration of pregnancy 1 mSv on the embryo/fetus should not exceed.

AERB limits India

The Risk of Melanoma in Pilots and Cabin Crew UV Measurements in Flying Airplanes

Recently, a meta-analysis reported an increased incidence of melanoma in pilots and cabin crew, which was possibly due to occupational exposures.¹ Cabin crews' exposure to cosmic radiation was assessed in different studies and always found below the allowed dose limit.² However, the cumulative exposure of pilots and cabin crew to UV radiation, a known risk factor for melanoma, has not been assessed to our knowledge.

Airplane windshields are commonly made of polycarbonate plastic or multilayer composite glass. UV-B (280-320 nm) transmission through both plastic and glass windshields was reported to be less than 1%. However, UV-A (320-380 nm) transmission ranged from 0.41% to 53.5%, with plastic attenuating more UV radiation than glass.³

Intrigued by our findings and the clinical observation of pilots developing melanomas on

sun-exposed skin, we measured the amount of UV radiation in airplane cockpits during flight and compared them with measurements performed in tanning beds.

The pathogenic role of UV-A in melanoma is well established. UV-A is capable of causing DNA damage in cell culture⁵ and in animal models. Pilots flying for 56.6 minutes at 30 000 feet receive the same amount of UV-A carcinogenic effective radiation as that from a 20-minute tanning bed session. These levels could be significantly higher when flying over thick cloud layers and snow fields, which could reflect up to 85% of UV radiation. Airplane windshields do not completely block UV-A radiation and therefore are not enough to protect pilots. UV-A transmission inside airplanes can play a role in pilots' increased risk of melanoma.

mindFly analysis

[What crew should know about their occupational exposure to radiation.](#)

If NASA's Chris Mertens has his way, weather forecasts and airplane cockpits of the future will include measurements of hazardous radiation in the atmosphere.

Mertens, a senior scientist at NASA's Langley Research Center in Hampton, Va., is developing a system to predict radiation entering Earth's atmosphere from space. The goal is to provide high-flying commercial airline passengers and crew with real-time information about the radiation they will be exposed to in flight.

"Aviation occupational radiation exposure currently is not monitored, measured and quantified," says Mertens. "This will be the first model of its type to do that."

Better be safe than SORRY.

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