

COMPARATIVE RISK OF MEDICAL USES OF X & GAMMA RADIATION  
TO PEOPLE LIVING IN HIGH RADIATION BACKGROUND AREAS

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Exposure to all types of ionizing radiation pose cancer risk, the statistical risk of developing cancer being  $1.25 \times 10^{-4}$  per man-rem or  $1.25 \times 10^{-2}$  per man-sievert. However exposure to radiation is unavoidable with one of the main sources of exposure being the use of X-rays, gamma - rays and radio - isotopes in medical diagnosis. The strategy of minimizing the overall societal risk is by minimizing radiation exposure to levels as low as reasonably achievable.

Radiation risk at high levels of exposure is well worked out. However risk associated with low level radiation exposure is calculated by linear extrapolation of high level exposure risk which is linear.

Linear extrapolation to low levels is questionable as man is endowed with several DNA-repair mechanisms which repair damage to DNA molecules caused by radiation.

In our work, we have identified areas in Sri Lanka where the natural radioactivity levels are very high, mainly due to the presence of Thorium bearing monazite sand. People living in these areas are continuously exposed to very high levels of radiation and they have been exposed to these high levels of radiation for generations. The highest levels of natural radiation so far found by us are in the Beruwala - Induruwa area.

It has recently been found that people who live in high radiation background areas have enhanced DNA-repair mechanisms. As such the risk of radiation exposure due to the use of radiation for medical diagnosis for people from high radiation background areas will be lower than for the average man for whom the risk levels in literature have been worked out.