

AbstractID: 6772 Title: US Population Dose From Medical Exposures: Analysis of Recent Trends

Background. NCRP Report 93 estimates that diagnostic x-rays contributed an average effective dose of 0.39 mSv in 1980, and accounted for 11% of the total US population dose from all sources of man made and background radiation. The last 25 years has seen a dramatic increase of medical imaging, particularly CT, but corresponding data on US population doses are virtually non-existent.

Purpose. To estimate the average effective doses to the US population from diagnostic radiology.

Method. We obtained data on the number of CT scans performed in the US in 2005 from M Bhargavan and JH Sunshine, PhD¹. Average effective doses for CT examinations were obtained from the 2000 UNSCEAR report. Assuming that CT accounts for about 70% of all medical exposures, as reported by Mettler et al² we computed the average dose to the current US population of 300 million.

Results. The average effective dose per CT examination is reported to be 8.8 mSv. The average dose from diagnostic radiology in the US in 2005, where 60 million exams were reported to be performed in 2005, would be approximately 2.5 mSv. This value is comparable to values reported in the literature, including 1.8 mSv for Belgium (1999), 2.0 mSv for Germany (1997) and 2.0 mSv for Luxembourg (2002). In the US, average natural background is 1 mSv from cosmic/terrestrial/internal sources, and 2 mSv from Radon exposure. Medical exposures are becoming the dominant sources of population radiation exposure in industrialized countries.

Conclusion. Population doses from medical imaging in the US may appear to have increased a factor of six or so in the last generation.

¹ Bhargavan M, Sunshine JH. Utilization of radiology services in the United States: levels and trends in modalities, regions, and populations. *Radiology* 2005; 234:824–832

² FA Mettler, PW Wiest, JA Locken and CA Kelsey CT scanning: Patterns of use and dose *J Rad Prot* 2000; 20:353-9