Abstract

Radiation exposure during diagnostic radiology remains a critical occupational radiation safety concern as the global volume and complexity of medical imaging procedures continue to increase. This study assessed personal dose equivalents received by 14 radiographers in three high-workload hospitals in Kitui County, Kenya. Personal dose equivalents were monitored monthly for three consecutive months using TLD-100 (LiF:Mg,Ti) dosimeters, with readouts performed using the Harshaw 8800 reader system at Kenyatta National Hospital (KNH). Descriptive analysis showed modest inter-hospital variability in occupational doses, which may reflect differences in workload, examination practices, and occupational positioning. The mean monthly personal dose equivalents for Hp(0.07) ranged from 0.112 to 0.246 mSv, while those for Hp(10) ranged from 0.101 to 0.205 mSv. Across all monitored worker-month observations, the pooled mean personal dose equivalents were 0.156 mSv for Hp(0.07) and 0.141 mSv for Hp(10), corresponding to annualized projections of 1.87 and 1.69 mSv y^{-1}, respectively, assuming comparable exposure conditions throughout the year. Ambient dose-equivalent rates, H*(10), measured in 61 rooms across five selected hospitals, ranged from 0.09 to 0.34 $\mu Sv \cdot h^{-1}$, with a mean dose-equivalent rate of 0.198 ± 0.026 $\mu Sv \cdot h^{-1}$. Under an assumed indoor occupancy factor of 0.8, the corresponding annualized ambient dose equivalent ranged from 0.63 to 2.38 $mSv \cdot y^{-1}$, with a mean of 1.388 $mSv \cdot y^{-1}$. The findings indicate relatively low occupational personal dose equivalents and ambient dose-equivalent rates across the surveyed facilities, although continued occupational monitoring and optimization of radiation-protection practices remain warranted.