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LETTER OPEN ACCESS

Reply to the Comments on "Diagnostic reference levels based on clinical indications for paediatric computed tomography examinations at the Mohammed VI University Hospital Center in Marrakech-Morocco"

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First, we would like to express our gratitude to the authors of the Letter to the Editor for their comments on our article (Boulanouar *et al.*, 2025). Our response gives us the opportunity to further explain our work. In response to the meticulous and critical analysis of our study on DRL-CI in paediatric CT, clarifications have been made here in order to improve the understanding of the article. The authors raised three points to which we respond.

Stratification of children

The first comment deals with the reporting of age stratification between the methods and results. The European Commission (2018) has recommended stratifying children according to their age for head CT and to their weight for other anatomical regions. However, radiology professionals at Mohammed VI UHC do not include children's weight in their protocols. In this study, age was used as the grouping parameter for all paediatric CT indications in order to compare our results with literature data.

As indicated in the article, children were divided into three age groups (1–5 years, 5–10 years, and 10–15 years). Because CT scans are rarely recommended in infants ($\leq$1 year) at the Mohammed VI UHC, with non-irradiating modalities such as ultrasound and MRI being preferred, the number of subjects available in this age group proved to be insufficient. Thus this age group was excluded from our analysis, and we believe that our work does not suffer ambiguity.

DRLs

For this study, DRLs were defined as the 75th percentile of the CTDIvol and DLP distributions. But we know that a weakness of the 75th percentile has progressively appeared for two reasons: (1) it restricts the whole distribution of doses to one single value, thus masking the large-scale dispersion of doses in reality, and (2) DRLs are used for optimization on each equipment of each center but become insufficient when optimization has been reached since image quality is altered by inappropriate further dose decrease. This is the reason why there are no dose limitations for medical exposures. It is certainly necessary that the definition of DRLs for the optimization of medical exposures be re-examined by the ICRP during the revision of the general recommendation for radiation protection by 2030 (Laurier and Schneider, 2025).

Thus, besides DRL evaluations, we investigated the distribution of doses as the minimal, the 25th, 50th, and 75th percentiles and maximal values for each indication. The Kruskal-Wallis test was used because it does not allow direct comparison with a specific quartile (such as the 75th percentile), but it does offer the possibility of identifying an overall difference in the distribution of doses (Frost, 2023).

Clinical translation in an evolving technology landscape

We acknowledge that CT equipment is evolving rapidly and that DRLs can therefore be influenced by the CT generation. Our study was conducted in the Mohammed VI University Hospital in Marrakech using a Siemens Somatom Emotion 16-slice scanner, equipped with automatic tube current modulation and regularly maintained to ensure its updates. Consequently, our results cannot be extrapolated to all currently marketed scanners but are certainly useful for equipment of the same quality.

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