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Letter to the Editor

Using the interquartile range in infection prevention and control research

Dear Editor,

Presenting the variability of specific variables within the domain of infection prevention and control (IPC) research, together with the median, gives valuable insights into the data's distribution. Instead of opting the traditional range, an alternative approach is to display the interquartile range (IQR). Although both terms incorporate the word "range", they fundamentally diverge in their interpretations. The range is constructed as the area of variation between the uppermost and lowermost limits on a given scale; representing the extreme values within the dataset. In contrast, the IQR represents the middle fifty percent of the data. Consequently, the IQR is less influenced by exceptional data points, commonly referred to as outliers. The IQR is often visualized by using a box and whisker plot.

In the context of the IQR, one might assume this is represented by Q1, corresponding to the 25^{th} percentile, and Q3, corresponding to the 75^{th} percentile (i.e., depicted as the box of the box and whisker plot), with these percentages separated by a dash. While this representation might increase interpretability and embodies elements of the IQR, it is essential to clarify that this does not constitute the formal definition of the IQR. The IQR is, in fact, the numerical difference between Q3 and Q1, yielding a single numerical value.

In our examination of original articles published in IPC journals, it is common to encounter the median along with the IQR, represented as Q1 and Q3, instead of in a single numerical value [1–6]. We believe that inclusion of the term "range" in IQR may potentially mislead researchers, leading to misconceptions about its true meaning. This misunderstanding persists, even though widely-used statistical software such as IBM SPSS (IBM, Armonk, NY) and R (R Foundation for Statistical Computing, Vienna, Austria) consistently produce a single numerical outcome when computing the IQR. In light of these observations, researchers seem to either disregard this output and or prefer to manually calculated Q3 and Q1 values. Therefore, we propose adapting the term to "interquartile distance" going forward. Interquartile distance (IQD) is defined as follows:

$$IQD = Q3 - Q1$$

This nomenclature is already integrated directly into numerous languages, such as Dutch ("interkwartielafstand" for distance), German ("Interquartilsabstand" for distance), French ("Écart interquartile" for distance), Norwegian ("interkvartil avstand" for distance); or is expressed in different wordings, for instance, Swedisch ("Interkvartilintervallet" for interval), Italian ("intervallo interquartile" for interval), Finnish ("interkvartiili alue" for area), Portuguese ("intervalo interquartílico" for interval), Bahasa Indonesia ("jangkauan interkuartil" for reach or extent). Notably, none of these incorporated the term "range". By employing interquartile distance (IQD), we believe that researchers are more likely to employ this measure of dispersion in accordance with its precise mathematical definition in the context of IPC research.

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Cynthia P. Haanappel, Anne F. Voor in 't holt*
Department of Medical Microbiology and Infectious Diseases, Erasmus MC University Medical Center, Rotterdam, the Netherlands

* Corresponding author. Address: Department of medical microbiology and infectious diseases, Erasmus MC university Medical Center, Rotterdam, the Netherlands. Tel.: +31(0) 107033510.
E-mail address: a.voorintholt@erasmusmc.nl (A.F. Voor in 't holt)

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