

An Overview on Assessing Agreement with Continuous Measurements

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In medical science and health care practice, accurate measurements are essential for proper evaluation. As new concepts, theories and technologies continue to develop, new scales, methods, tests, and instruments for evaluation become available for measurement. As errors are inherent in every measurement procedure, one needs to ensure that the measurement is reliable and accurate before its use in future studies or in practice. In this talk, we provide an overview on assessing agreement with continuous measurements by combining and unifying a large and diverse body of literature on various concepts and associated statistical methodologies for assessing agreement that have evolved over several decades. We classify the existing approaches as (a) descriptive tools, (b) unscaled summary indices: repeatability coefficient and reproducibility coefficient, limits of agreement, coverage probability, and total deviation index), and (c) scaled summary indices attaining values between -1 and 1: intraclass correlation coefficient (ICC), concordance correlation coefficient (CCC), and coefficient of individual agreement (CIA). We discuss the interpretation of the magnitude of the agreement values on using the measurements in clinical practice; illustrate the methodologies with examples and identify gaps that require further research, and provided future directions on assessing agreement.