Computational and Mathematical Methods in Medicine

Special Issue on
Quantitative Methods and Applications in Diagnostic Research

CALL FOR PAPERS

Diagnosis of a disease is a challenging task. The diagnostic pathway usually starts with medical history and physical examination of the patient and continues with simple tests followed by more invasive and costly procedures. Several factors have increased our ability to reach a proper diagnosis, which is crucial for successful treatment of the underlying disease. Well-known examples are the increase of available technology, the explosion of gene sequencing techniques, and the improved collection of routine health care data. Although these innovations are very promising indeed, a large number of published studies of diagnostic accuracy are still affected by methodological flaws or provide results with limited practical applicability. The adoption of a proper methodology for evaluating the available diagnostic procedures, either alone or in combination, is urgently needed.

The purpose of this special issue is to publish high-quality research papers as well as review articles addressing recent advances on diagnostic research.

Potential topics include, but are not limited to:

▶ Theranostics approaches
▶ Methodological challenges in identifying overdiagnosis
▶ Preclinical and laboratory validation of new molecular tests
▶ Assessment of diagnostic accuracy in primary studies
▶ Diagnostic meta-analysis and systematic reviews (identifying or dealing with publication bias, treatment of missing information due to poor or incomplete reporting, dealing with missing data, new approaches for inference on summary estimates, etc.)
▶ Use of big data such as routine population data and health care registries
▶ Personalised medicine (stratification, subgroup analyses, validation and implementation of multivariable prediction models, etc.)
▶ Statistical techniques for the cost-effectiveness analysis in the assessment of diagnostic test
▶ Challenges in biomarkers discovery (identifying patients who are likely to develop disease, classification into disease subtypes, characterization of response to treatment, prediction of disease progression or recurrence, and identification of patients who are likely to respond to a treatment)
▶ Statistical issues in the biomarker adaptive design for randomized clinical trials (testing procedures to identify predictive biomarkers, subgroup analysis, multiple testing and false discovery rate, and sample size and power)
▶ Original applications of well-known methodology in real-world cases
▶ Methodological challenges in the measurement of diagnostic variables and outcomes (e.g., dealing with complex types of measurement error, incomplete reference standards, and missing data)
▶ Machine learning and optimization approaches to diagnosis

Authors can submit their manuscripts via the Manuscript Tracking System at http://mts.hindawi.com/submit/journals/cmmm/qma/.

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