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Title: The Echocardiographic Diagnosis Of Rheumatic Heart Disease: A Review of the Performance and Application Of The World Heart Federation Criteria

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Background & Aims: The World Heart Federation (WHF) published the first international evidence-based guideline on the echocardiographic diagnosis of Rheumatic Heart Disease (RHD) in 2012. This guideline has since been applied widely in RHD endemic regions for research, global burden of diseases data collection, and in clinical practice. There has been substantial research evaluating the performance and applicability of these guidelines. This review aimed to summarise the evidence regarding the performance of the WHF 2012 criteria and inform the subsequent revision of the WHF guidelines.

Methods: A scoping review assessing the performance of the WHF 2012 criteria was performed. We searched Cochrane, Embase, Medline, PubMed Lilacs, Sielo, and Portal BVS databases for relevant studies between January 2012 - March 2023. Of the 4047 papers that met the search criteria, 34 papers that assessed the specificity, inter-rater reliability (IRR), hand-carried ultrasound application, and modification of the criteria for simplicity were included. The review followed the PRISMA Extension for Scoping Reviews guideline.

Results: The WHF 2012 criteria are 100% specific for definite RHD when applied in low-prevalence populations. The criteria demonstrate substantial and moderate IRR for detecting definite and borderline RHD, respectively. The IRR for morphological features is lower than for valvular regurgitation. When applied to hand-carried ultrasound performed by an expert, modified versions of the criteria demonstrate a sensitivity and specificity range of 79 - 90% and 87 - 93%, respectively, for detecting any RHD; however, they perform best for definite RHD. The sensitivity and the specificity are reduced when performed by non-experts in task-sharing but remain moderately accurate.

Conclusions: The WHF 2012 criteria are highly specific and accurate for detecting definite RHD. However, evidence highlights the difficulty in determining borderline cases. There are limitations in applying all aspects of the criteria in specific settings, including task-sharing. This summary of evidence can inform the updated version of the WHF guidelines to ensure applicability across RHD endemic regions.