Developing and testing a diabetic retinopathy screening programme in Vietnam

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PURPOSE: To compare the diagnostic test accuracy (DTA) of trained diabetic retinopathy (DR) graders in Vietnam against a reference standard from the UK, and assess the impact of additional grader training.

METHODS

DR grader training (Mar 2018): Level 1 DR graders (nurses, endocrinologists, and general practitioners), level 2 graders (mid-level ophthalmologists) and level 3 graders (senior ophthalmologists) in Vietnam received training from UK graders to grade DR severity.

Phase 1 (Sept-Nov 2018): Fundus images were graded for DR by level 1, 2 and 3 graders in Vietnam. A trained grader from the UK graded all images retrospectively in masked fashion and served as the reference standard.

Remedial training from phase 1: Supplementary test and training was delivered to Vietnamese graders between Mar-Nov 2019.

Phase 2 (Mar-Apr 2021): An additional subset of images were graded by level 1, 2 and 3 graders in Vietnam. A trained grader from the UK graded all images retrospectively in masked fashion and served as the reference standard.

Analysis: DTA was calculated using sensitivity, specificity, and positive and negative predictive values (with 95% CIs).

RESULTS

- **Phase 1:** The sensitivity for detecting 'any DR' was low among all graders in Vietnam (level 1 graders; 41.8 (34.0, 50.0), level 2 graders; (42.5 (34.6, 50.7), level 3 graders; 42.2 (33.2, 51.8).
- **Phase 2:** The sensitivity for detecting 'any DR' improved drastically for all graders in Vietnam after remedial test and training was provided (level 1 graders; 95.8 (97.3, 98.9), level 2 graders; (93.0 (83.7, 97.4), level 3 graders; 85.4 (70.1, 93.9).

- *Any DR was defined as grades R1,R2,R3s,R3a and Ungradable

CONCLUSION

- Grading accuracy was low in Vietnam in the first six months of implementing a training programme but after further training was delivered, DTA among all graders increased.
- Findings from this study are particularly important for DR programme planners in low- and middle-income countries.