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Title: RESULTS OF A NOVEL TRAIN THE TRAINER MODEL FOR SCALING RHD ACTIVE CASE FINDING

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Background & Aims: Echocardiographic screening for rheumatic heart disease (RHD) is recommended for early detection in high endemic settings. However, strategies for scaling up population-based screening outside research settings are still limited. This study aimed to test a train the trainer model for scale up of echocardiographic screening for RHD.

Methods: This was a two-phased prospective cohort study where four nurses from four primary health centers in Lira district, northern Uganda were recruited in phase 1. Nurses underwent a three-day training and certification in simplified RHD screening echocardiographic protocols by experts from Uganda Heart Institute. Thereafter, nurses integrated screening of patients aged 5 - 40 years into their routine clinic workflow for two months, identifying screen positive (RHD based on MR ≥ 2 cm or AR ≥ 1 cm, LV systolic dysfunction or pericardial effusion) or screen negative participants. Screen positive participants were referred to the regional referral hospital for confirmation. Echocardiograms were uploaded to a cloud-based server for interpretation by an expert. The proportion of correctly interpreted studies was calculated using the expert's interpretation as reference. In phase 2, 12 nurses (3 per center) were trained and certified by respective primary trainers from phase 1, and integrated screening as in phase 1.

Results: Phase 1 nurses screened 406 participants, with each nurse screening a minimum of 100 participants. The median age of participants was 21 (IQR, 12 - 30), and 274 (67.7%) were females. There were 23 (5.7%) screen positive, 365 (90.3%) screen negative participants, and 16 (4.0%) inconclusive studies. Of the screen positive participants, 20 (87.0%) had RHD and 3 (13.0%) had other cardiac diseases (one with LV dysfunction and two with congenital heart disease). The trainees correctly identified 73.9%

(95% CI, 51.9 - 89.7) of all screen positive participants and 67.7% (95% CI, 62.6 - 72.4) of screen negative participants. (Figure 1) RHD was correctly identified in 70% (95% CI, 45.7 - 88.1) of participants. The accuracy of trainees in identifying screen positive RHD declined over the screening period. Overall, the image quality improved over the screening period with an average American College of Emergency (ACEP) score of 3.69%. Trainees performed best in PLAX 2D (99.1% of images were diagnostic) and worst in the AP4C view (90.5% were diagnostic). Eight (8) patients were confirmed with RHD, 4 had borderline RHD and 4 had definite RHD. The trainees correctly identified 6 (75%) of the confirmed cases. Data collection for phase 2 study is ongoing and we shall compare the performance of phase 1 and phase 2 nurses.

Conclusions: Our study shows that nurses can integrate simplified echocardiographic protocols for RHD into their routine clinical work at the primary health care centers. However, there is need for a robust competency assessment and remediation plan for ongoing trainee performance. The performance of phase 2 nurses will inform us on the feasibility of a train the trainer model for scale.