Development of a district-based competency assessment system in Mubende Region Uganda, February to July 2023

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Background: Competency assessments (CA) are critical in identifying performance gaps among laboratory workers that can hinder high-quality patient care. Until April 2023, there was no comprehensive system for assessing laboratory personnel's technical competence in Mubende Region. We established a district-based technical CA system for laboratory workers.

Methods: We organized a cascaded training for CAs in 8 districts in Mubende Region, Central Uganda. First, we developed standard operating procedures (SOPs) and an observational form to conduct CAs and trained three district-based laboratory staff (trainers) from each district on how to conduct them. Seven laboratory tests were included in the CAs: HIV Rapid Diagnostic Testing (HIV-RDT), HIV-Rapid Testing for Recent Infection (RTRI), stool analysis, TB Ziehl-Neelsen (TB-ZN) staining, serum Cryptococcus Antigen (CrAg), CD4 Visitect testing, and blood examination for malaria parasites (BMPs). Trainers were assessed pre- and post-training using written examinations and observations and scored in areas of patient preparation, sample accession, collection, testing, storage, results interpretation, biosafety, work area management, and results documentation. Trainers then trained facility staff at 40 district facilities on the same testing techniques. CAs were performed and facility staff were assessed in the same way. An average competence score of 80% was considered a passing mark.

Results: Trainers achieved an average post-training score of 94%, up from 84% pre-training ($p<0.0001$). Pass rates for facility staff during the CA were 67% (TB-ZN), 65% (RTRI), 53% (HIV-RDT), 58% (BMPs), 35% (stool analysis), and 33% (CD4 Visitect). The overall average performance score increased from 65% to 79% after training ($p<0.0001$). The best-performed testing areas were documentation (82%), sample collection (80%), biosafety and work area management (80%), sample accession (79%) and patient preparation (78%), while

the poorest-performed areas were sample testing and results interpretation (72%), sample storage (75%), and written evaluations (76%).

Conclusions: A new district-based laboratory CA system in Mubende Region demonstrated suboptimal competency in conducting laboratory tests even after training. Regular supervision is needed to improve performance for specific tests and competency areas.

Keywords: Competency assessment, laboratory testing, Mubende Region, Uganda, district-based, Cascade training

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