

Abstract

This study evaluates six POC Hb measurement products in terms of accuracy, cost per test, consumables, required training for use, device maintenance, time to conduct test, patient acceptance, environmental robustness, and portability to determine each device's suitability for rural, resource-constrained settings. The data collection for this project will span 20 days while creating health profiles for 1,200 children in schools across Ajmer District, Rajasthan. During the health checkups, a venous blood sample will be taken from each child and the two non-invasive methods will be conducted. The remaining four methods will be conducted after sample collection is finished. After all POC methods are completed, the samples will be brought to a nearby hospital and tested using a gold standard hematology analyzer. The mean difference of reference test method ($\text{mean} \pm \text{SD}$) for all samples will be calculated to determine accuracy. Each of the criteria under evaluation have been weighted according to importance, based on prior research and discussion with health workers, such that the rating of each device will be out of 100 once evaluated according to each criteria.

The aims of the study are to 1) determine which device is most accurate and suitable for use in settings like ours and 2) define shortcomings in existing hemoglobin measurement devices and recommend design criteria for a new product which best suits low resource, rural settings.