Using Quality Improvement Interventions to Improve Laboratory Services at Public Healthcare Facilities in Uganda

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Background

Despite the rapid scale-up of HIV prevention, care, and treatment interventions in Uganda, quality laboratory services exist but face several challenges, including: high turn-around time for laboratory tests hence long patient waiting times; high sample rejection rates; and machine downtime for automated laboratory equipment.

The USAID/Strengthening Uganda’s Systems for Treating AIDS Nationally (SUSTAIN) project works with the Ministry of Health to improve access to quality laboratory services in Uganda. The project supports 12 regional referral hospitals, three general hospitals, two health center IVs and one private not-for-profit hospital.

The project evaluated the performance of 17 project-supported laboratories on three selected quality improvement (QI) indicators:

1. Turn Around Time (TAT) for laboratory tests;
2. Specimen acceptability for laboratory testing (CD4, complete blood count & Chemistry tests); and
3. Equipment uptime (CD4, complete blood count & Chemistry equipment).

Table 1. Implementation process changes for the three laboratory service indicators

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Description of problem</th>
<th>Changes implemented</th>
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<td>% of tuberculosis (TB)</td>
<td>Only 57% of the test results for TB sputum microscopy were being dispatched within the acceptable TAT of three hours. This was attributed to processing bigger batches of samples, and the lack of designated laboratory staff at the TB workstations.</td>
<td>Processing smaller batches of sputum samples (5 to 8 samples) to reduce waiting time.</td>
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<td>% of samples for automated tests (CD4, CBC, Chemistry)</td>
<td>The acceptability of samples for automated laboratory was 98% at baseline, below the target of 100%. Hence 2% of the samples were being rejected due to poor specimen management practices including: collection, packaging, transportation, and storage prior to laboratory testing.</td>
<td>Conducting regular Continuous Medical Education (CME) on proper specimen management for all hospital staff involved in specimen collection.</td>
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<tr>
<td>Proportion of days automated equipment (CD4, CBC, Chemistry) is functional</td>
<td>Average equipment uptime was 79% at baseline which was below the desired performance target of 96%.</td>
<td>Performing and documenting proper routine equipment maintenance procedures on equipment maintenance logs.</td>
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Intervention

Using a collaborative quality improvement model, laboratory teams were first oriented on the basics of improvement science and subsequently supported through on-site coaching and mentorship sessions coupled with structured collaborative learning sessions. Facility Laboratory Quality Improvement teams were formed and supported to initiate QI interventions to enhance the use of evidence-based approaches to improve laboratory service delivery. A baseline performance was established for each facility and improvement gap against set targets calculated.

The project also supported teams to brainstorm on the root causes of the low performance using the fish bone analysis approach. Later interventions (proposed changes) specific to each indicator were agreed upon for implementation.

For eight months (October 2014–May 2015), improvement teams at each of the 17 laboratories monitored performance on a monthly basis for the three indicators. Teams agreed on the implementation process to include the following per indicator (Table 1).

Results

Quality improvement indicator values at the end of the eight-month intervention showed significant improvement in the TAT for TB sputum microscopy from 57% to 81% and equipment uptime from 78% to 90%. Specimen acceptability for automated tests improved slightly from 98% to the target value of 100% (Figure 1).

Conclusion

The results demonstrate that QI interventions can provide an effective tool for improving the quality of laboratory services if specific causes of poor performance are identified.

Supportive supervision of laboratory QI process teams by the hospital management, particularly the hospital QI focal person, enhances motivation, commitment and compliance of laboratory staff to QI interventions.

In addition, improvement of laboratory infrastructure by the SUSTAIN project through renovations provided spacious and safe work areas for TB and other automated laboratory tests. This coupled with installation of automated laboratory diagnostic equipment for CD4, CBC and chemistry tests enabled efficient workflow and provided a motivating working environment that contributed to improving the quality indicators.

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Figure 1. Average monthly quality indicator values for TB turn around time, specimen acceptability and equipment uptime