Case study: Integrated Infectious Disease Capacity-Building Evaluation (IDCAP) in Uganda

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Ugandan context

- Training experts noted need for technical assistance, such as CQI
- CQI experts noted need for additional training of mid-level practitioners
- Integrated infectious disease care may be more appropriate clinically
  ...and cost-effective

Outline

- Aims and Interventions
- Data Surveillance System
- Example of Results
- Summary of Results
- Cost-effectiveness Analysis

Create & evaluate an innovative capacity-building program

- Develop an Integrated Management of Infectious Disease (IMID) curriculum for midlevel practitioners
- Complement the training program with On-Site Support (OSS)
- Measure their effect on the quality of care and health outcomes
- Estimate the cost-effectiveness of the interventions
Integrated Management of Infectious Disease (IMID)

- WHO curricula such as IMCI, ETAT, and IMAI
- Advances in health professional education (Miceli, et al. IJID 2012)
- Hospice Uganda Diploma Program in Palliative Care
- Health Care Improvement (HCI)
- Joint Uganda Malaria Training Program (JUMP)

On-Site Support (OSS) Mobile Team

- Medical officer
- Clinical Officer
- Laboratory Technologist
- District contact person/nurse officer

OSS Schedule

<table>
<thead>
<tr>
<th>Day One</th>
<th>Day Two</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multidisciplinary Team Session (1 hour)</td>
<td>CQI trainings (90 minutes)</td>
</tr>
<tr>
<td>Breakout Sessions (1 hour)</td>
<td>Clinical Coaching (2 - 3 hours)</td>
</tr>
<tr>
<td>Clinical Coaching (2 - 4 hours)</td>
<td>Data Review / Validation (1 - 2 hours)</td>
</tr>
</tbody>
</table>
Mixed Design With Pre/Post and Cluster Randomized Trial Components

<table>
<thead>
<tr>
<th>Time 0</th>
<th>Time 1</th>
<th>Time 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARM A</td>
<td>IMID</td>
<td>OSS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bi-monthly OSS</td>
</tr>
<tr>
<td>ARM B</td>
<td>IMID</td>
<td>OSS</td>
</tr>
</tbody>
</table>

Three levels of measures

- Individual Clinical Competence & Practice
- Facility Performance
- Patient Outcomes & Population Health

Summary

- IDCAP was one of the first randomized trials of OSS in Africa.
- IMID built on existing curricula and recent advances in medical education.
- OSS focused on individual clinical practice and team-based approach to quality improvement.
Outline

• Aims and Interventions
• Data Surveillance System
• Example of Results
• Summary of Results
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Data Surveillance System

Data surveillance system supported high quality data

Infrastructure and equipment

• Computer hardware and software
• Reliable power sources

Personnel

• Data entry assistants
• Central team with data technicians, managers and statisticians

Comprehensive outpatient record form collected consistent data

• Triage
• Patient identification
• History and exam findings
• Laboratory requests and results
• Diagnoses
• Drugs – name and availability
• Referrals
• Clinician
Revised "Medical Form 5"

Data surveillance system built on existing MOH registers for other care settings

Maternal & Child Health
- ANC Register
- Maternity Register
- PNC Register

HIV Care
- HIV/ART Care Cards
- Pre-ART Register
- ART Register
- DBS DNA PCR Lab

Tuberculosis
- NTLP Register
- TB Lab Register
- Sub-county TB Register

Emergency Treatment, Assessment and Triage
- In-patient Register

23 Facility performance indicators
- Emergency triage, assessment and treatment (ETAT)
- Case management of fever
- HIV prevention
- HIV Care
- ART
- Respiratory illness
- TB/HIV

Summary
- Comprehensive outpatient record form collected consistent data
- Built on existing MOH registers for other care settings
- 23 facility performance indicators
Outline

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Example: % outpatients triaged

Significantly pre/post increase in % of outpatients triaged

<table>
<thead>
<tr>
<th>Arm</th>
<th>Time 1 – Time 0</th>
<th>RR (CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arm A</td>
<td>2.03</td>
<td>(1.13, 3.64)*</td>
</tr>
<tr>
<td>Arm B</td>
<td>1.29</td>
<td>(1.01, 1.64)*</td>
</tr>
</tbody>
</table>

Arm A vs. Arm B:

Time 1 – Time 0: 1.58 (0.82, 3.01)

Dispersion across facilities
Analysis for 23 indicators showed impact on 6 indicators

- Outpatients triaged
- Emergency & priority patients admitted, detained or referred
- Malaria suspects received appropriate treatment
- Smear negative suspects treated w/ anti-malarials
- U5 pneumonia suspects assessed for pneumonia
- HIV infected patients enrolled in care
Cost Analysis

Intervention
• Curriculum Development
• IMID
• On-site Support

Treatment
• Drugs

Prospective cost data collection
Assigned activity code to every expenditure
– Curriculum Development
– IMID
– On-site Support
– Data surveillance system and evaluation
– Administration

Tracked attendance at OSS activities
Tracked patient care with the Data Surveillance System

Cost analysis, $US

<table>
<thead>
<tr>
<th></th>
<th>IMID + OSS (Arm A)</th>
<th>IMID (Arm B)</th>
<th>Incremental cost of OSS</th>
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</thead>
<tbody>
<tr>
<td>Grant</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Curriculum</td>
<td>$16,994</td>
<td>$12,610</td>
<td></td>
</tr>
<tr>
<td>IMID</td>
<td>22,047</td>
<td>22,047</td>
<td></td>
</tr>
<tr>
<td>OSS</td>
<td>49,230</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>$88,271</td>
<td>$34,656</td>
<td></td>
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<tr>
<td>MOH Salaries</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IMID</td>
<td>$464</td>
<td>$456</td>
<td></td>
</tr>
<tr>
<td>OSS</td>
<td>533</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>$997</td>
<td>$456</td>
<td></td>
</tr>
<tr>
<td>Malaria drug savings</td>
<td>(523)</td>
<td>(77)</td>
<td>($53,709)</td>
</tr>
<tr>
<td>Net cost</td>
<td>$88,745</td>
<td>$35,036</td>
<td>$53,709</td>
</tr>
</tbody>
</table>

Integrated Epidemiological Model

Use trial parameters for the effect of interventions on treatment received

Use epidemiological parameters for the effect of treatment on patient morbidity and mortality
Integrated Epidemiological Model

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<th>IMID + OSS</th>
<th>IMID</th>
<th>Incremental</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net cost</td>
<td>$88,745</td>
<td>$35,035</td>
<td>$53,710</td>
</tr>
<tr>
<td>Lives saved</td>
<td>23</td>
<td>15</td>
<td>8</td>
</tr>
<tr>
<td>$/Life</td>
<td>$3,875</td>
<td>$2,336</td>
<td>$6,799</td>
</tr>
<tr>
<td>DALYs Saved</td>
<td>729</td>
<td>484</td>
<td>245</td>
</tr>
<tr>
<td>$/DALY</td>
<td>$122</td>
<td>$72</td>
<td>$219</td>
</tr>
</tbody>
</table>

Summary

- Integrated epidemiological model combines most indicators to provide one aggregate measure of the effect IMID and OSS across three age groups.
- Uganda’s GDP in 2011 was roughly US$ 487 per capita, suggesting IMID and OSS were highly cost-effective interventions both individually and in combination by WHO standards.
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Acknowledgments

IDCAP Steering Committee

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