The GSID System: Diagnostic Health Information Beyond the Point of Care

International Workshop on Point of Care (POC) Tests for Diagnosis of HIV and TB
Harare, Zimbabwe
16 – 19 March 2015

Ian Francis
Global Solutions for Infectious Diseases
Thinking Beyond the Point of Care

At Point of Care

Current Use
- Confirm diagnosis
- Guide patient treatment

Opportunities
- Electronic Medical Records
- Guidelines for HCWs

Beyond the Point of Care

Current Use
- Paper: Error-prone & delays

Opportunities
- Surveillance
- Supply Chain
- Program Management / M&E
- Quality Assurance
Proof Of Concept Study: Manicaland, Zimbabwe

- 16 phones at 5 Locations
- Over 60 nurses trained
- Tests
  - HIV: Determine, First Response, SD Bioline
  - Malaria: First Response, Paracheck, SD Bioline
Field Evaluation of a camera-Based Mobile Health System in Low-Resource Settings

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Proof of Concept Study: Data Captured with Each Result

Collected during Routine Patient Care:

- Diagnostic Result (positive / negative)
  - Including image of RDT
- Demographic (age, gender)
- Consumption / Supply (test, lot, expiry)
- User (department, facility)
- Geographic
- Temporal (time, date)

- Possibilities: Patient ID, Individual HCW, symptoms…
Data Beyond Point of Care: Surveillance

Malaria Tests – By Age Range

- **Current**
  - Burden of Disease
  - Monitoring

- **Future**
  - Outbreak Detection – *spike in positive results*
  - New & Emerging Infections - *testing up, but negative results*
Data Beyond Point of Care: Logistics / Supply Chain

Malaria Results: By Test

- Paracheck
- SD Bioline
- First Response

Malaria: Expiration Dates

- Within 30 Days: 11
- 31-60 Days: 16
- 61-90 Days: 56
- 91-180 Days: 580
- 180+ Days: 1160
Data Beyond Point of Care: Monitoring & Evaluation

Results by Health Facility

- Mutare Provincial Hospital
- Nyanga District Hospital
- Tombo Health Center
- Hauna District Hospital
- Zindi Health Center

Results by Department
Nyanga District Hospital

- Opportunistic Infection (OI)
- Family-Child Health (FCH)
- Out-Patient Dept. (OPD)
- Maternity
Data Beyond Point of Care: Program Management

Tests per Hour

Tests per Day
Next Steps: Need for Quality Assurance

<table>
<thead>
<tr>
<th>Partial Line:</th>
<th>49 Tests (~3%)</th>
</tr>
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<tbody>
<tr>
<td>Positive</td>
<td>Positive</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Heavy Background:</th>
<th>65 Tests (~4%)</th>
</tr>
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<tbody>
<tr>
<td>Negative</td>
<td>Positive</td>
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</table>
Next Steps: Remote Quality Assurance

- Remote Quality Assurance Report Visual Interpretation & Test Images
- Central Technician / Automated Review
- Review Procedures / Modify Training
- Point of Care Rapid Testing

Flowchart Diagram:
- Remote Quality Assurance Report Visual Interpretation & Test Images
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Next Steps: Zimbabwe

- Evaluate Remote QA Capacity

- Planning Phase 2 in Zimbabwe
  - Include HIV, malaria, and syphilis
  - Add non-RDT results reporting (e.g. T3 / T5)
  - Provincial Scale-up: 200-500 sites
Next Steps: Integrating Data

Integrate data with existing health information management systems

- DHIS2 for surveillance
- Supply chain management
- Electronic medical records
- Last mile medical records
Next Steps: Universal Reader
Adding Well-Evaluated RDTs

- HIV
- Malaria
- Syphilis
- Influenza
- Dengue
- Hepatitis B
- Hepatitis C
- Leishmania
- Filiariasis
- Chagas
- RSV
- Tetanus
- Lassa Fever
- Ebola – New!
Next Steps: Longer Term

- Vertical Programs: HIV and malaria
- Perinatal: HIV + malaria + syphilis
- Febrile: Flu + Malaria + Dengue + Ebola
- Use Zimbabwe as a role model for other countries in Africa and beyond
Our Vision

Real-Time Reporting of All Critical Infectious Diseases on a Global Scale
Thank you!

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