The Millennium Global Village-Network: Helping to Achieve the MDGs by Improving Quality, Access and Efficiency

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Agenda

- Millennium Villages Project Overview
- The Problem
- MGV-Net Solution: OpenMRS/ChildCount+
- Terminology/Enterprise Architecture
- OASIS II Evaluation and Malaria in Uganda
Millennium Villages Project

- Partnership between the Earth Institute Columbia University, UNDP, Millennium Promise and national governments.
- Primarily operates in 10 countries in 14 agro-ecological zones in Sub-Saharan Africa
- Integrated development at $120 pc/y
Millennium Villages

- Koraro, Ethiopia
- Bonsaaso, Ghana
- Dertu, Kenya
- Sauri, Kenya
- Gomalira, Malawi
- Mwandama, Malawi
- Tiby, Mali
- Timbuktu, Mali
- Ikaram, Nigeria
- Pampaida, Nigeria
- Mayange, Rwanda
- Potou, Senegal
- Mbola, Tanzania
- Ruhiira, Uganda
Role of Health Information

- Three of eight MDGs are health-related
- MVP establishes one clinic per 5000 people
- 1 CHW for 100 HH
- Improve care
- Assess impact and effectiveness of program
<table>
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<tr>
<th>Monthly Serial Number</th>
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<th>New Patient</th>
<th>Address</th>
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<td>Ayace</td>
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## Comparable and Timely Data

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<th>Feb. – April Ave.</th>
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<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 5</td>
<td>50.0%</td>
<td>24.4%</td>
<td>-51.3%</td>
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<tr>
<td>&gt;= 5</td>
<td>35.4%</td>
<td>12.3%</td>
<td>-65.4%</td>
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<tr>
<td>% suspected</td>
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<tr>
<td>&lt; 5</td>
<td>73.7%</td>
<td>73.5%</td>
<td>0.4%</td>
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<td>% suspected, treated</td>
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<td></td>
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<tr>
<td>&lt; 5</td>
<td>67.2%</td>
<td>32.3%</td>
<td>-51.0%</td>
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<tr>
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<td>-62.4%</td>
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<tr>
<td>Coartem</td>
<td>377</td>
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</table>

[Graph showing data comparison for Uganda and Rwanda]
FIGURE 1. eHealth M&E Logical Framework

**INPUTS**
- Computers/Servers/Mobile Phones
- Electronic Medical Records
- Telecommunications Infrastructure
- Capacity Building
- Community Health Care Worker Training
- Emergency Medical Services protocol
- Non-emergent referral system
- Telemedicine system
- mHealth Applications and mLearning

**OUTPUTS**
- Basic Voice and Text Communication
- Community Mobilization, Wellbeing, and Empowerment
- Data warehouse
- Disease Surveillance and Early Warning
- Supply Chain Management
- Improve point-of-care decision making and service delivery

**OUTCOMES**
- Raise knowledge and awareness about diseases
- Reduce Error Rates from Data Entry
- Behavior Change
- Improve treatment compliance
- Improve disease prevention

**IMPACT**
- Leverage Achievement of MDGs
  - Goal 4: Reduce Child Mortality
  - Goal 5: Improve Maternal Health
  - Goal 6: Combat HIV/AIDS, Malaria, other diseases

- Improve access and quality of health care
- Reduce administrative and point-of-care costs
- Improve coordination and administration of health service delivery
- Improve Intra-facility Communication
- Improve Monitoring and Evaluation

**INPUTS**
- Improve treatment compliance
- Improve disease prevention

**OUTPUTS**
- Raise knowledge and awareness about diseases
- Reduce Error Rates from Data Entry
- Behavior Change

**OUTCOMES**
- Improve treatment compliance
- Improve disease prevention

Courtesy of Andrew Kanter. Used with permission.
Vision: MGV-Net Information System

- Bottom-up
- Patient-centered
- Locally-owned/maintained
- Integrated/interoperable
- Provide local value
- Global reach
- Sustainable
Millennium Global Village-Network Including ChildCount+ and VSVA

MGV-Net

OpenMRS

ChildCount+
CHW Decision Support and Info System

Data-driven Feedback (in ‘Real-Time’) to CHWs for Improved Decision Making

1. CHW Makes Decision on Households (HH) to Visit
2. CHW Visits HH and Assesses state of Children Under 5 and Pregnant Women
3. CHW Makes Decision on Proper Treatment and Services
4. CHW Provides and/or Advises on Treatment and Services
5. CHW Makes Decision on Proper Data to Record
6. Data is captured electronically into Child-Count+ (MGV-Net)
7. MGV-Net produces automatic Feedback and routine Reports
Looking up Patients...

Patient Search

Find Patient(s)

Patient Identifier or Patient Name: jane
Include Verbose

<table>
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<tr>
<th>Identifier</th>
<th>Given</th>
<th>Middle</th>
<th>Family Name</th>
<th>Age</th>
<th>Gender</th>
<th>Birthdate</th>
<th>Resides in Cluster</th>
<th>Telephone Number</th>
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<tr>
<td>IDMS</td>
<td>Jane</td>
<td>Doe</td>
<td></td>
<td>28</td>
<td></td>
<td>≈ 01/01/1982</td>
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</table>

Add New Patient

Create Patient

To create a new person, enter the person's name and other information below first to double-check that they don't already have a record in the system.

Name
Birthdate
(format: mm/dd/yyyy)

Gender

Create Person

Courtesy of Andrew Kanter. Used with permission.
Prior Encounters...

Jane Doe
28 yrs (~Jan 1, 1982)

Last encounter: Verbal Autopsy @ Unknown Location, Feb 24, 2010

All Encounters

<table>
<thead>
<tr>
<th>Encounter Date</th>
<th>Encounter Type</th>
<th>Provider</th>
<th>Form</th>
<th>Location</th>
<th>Enteror</th>
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<td>Doctor Super User</td>
<td>CC+ Household Visit Form</td>
<td>Sauri Clinic</td>
<td>Doctor Super User</td>
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<td>Unknown Location</td>
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Courtesy of Andrew Kanter. Used with permission.
### French

**Jane Doe | 28 yrs | Health ID: 1DM5 | Clinic ID: 44444**

**Rencontre: CHERA Visit le 24/02/2010 at Sauri Clinic**

**Fiche: CC+ Household Visit Form**

4.0 Any household member available for visit/interview: **Oui**

4.1 TOTAL CHILDREN UNDER 5YO VISITED IN HOME: **3.0**

4.2 **SUIVI NUTRITIONNEL**
- Education/Conseil: **CONSEIL POUR L'UTILISATION DES MOUSTIQUAIRES**
- **CONSEIL POUR LE PLANNING FAMILIAL**

5.0 TOTAL WOMEN 15-49YO SEEN IN HOUSEHOLD: **4.0**

5.1 TOTAL WOMEN 15-49YO SEEN IN HOUSEHOLD USING MODERN FAMILY PLANNING METHOD: **3.0**

6.0 Long-lasting insecticidal mosquito nets (LLINs): **3.0**

6.1 NUMBER OF SLEEPING SITES IN PATIENT'S HOUSEHOLD: **4.0**

---

### English

**Jane Doe | 28 yrs | Health ID: 1DM5 | Clinic ID: 44444**

**Encounter: CHERA Visit on 02/24/2010 at Sauri Clinic**

**Form: CC+ Household Visit Form**

4.0 Any household member available for visit/interview: **YES**

4.1 TOTAL CHILDREN UNDER 5YO VISITED IN HOME: **3.0**

4.2 **NUTRITION COUNSELING**
- **BEDNET COUNSELING**
- **FAMILY PLANNING COUNSELING**

5.0 TOTAL WOMEN 15-49YO SEEN IN HOUSEHOLD: **4.0**

5.1 TOTAL WOMEN 15-49YO SEEN IN HOUSEHOLD USING MODERN FAMILY PLANNING METHOD: **3.0**

6.0 NUMBER OF FUNCTIONING BEDNETS IN THE HOUSEHOLD: **3.0**

6.1 NUMBER OF SLEEPING SITES IN PATIENT'S HOUSEHOLD: **4.0**

---

*Courtesy of Andrew Kanter. Used with permission.*
### History of Present Illness

**Chief complaint:**

### Physical Exam

### Impressions/Diagnoses:

#### Problems Added:

1. [ ] Alcohol Abuse
   - [ ] Gastroenteritis
   - [ ] Measles
   - [ ] Tetanus

2. [ ] Anemia
   - [ ] Hypertension
   - [ ] Meningitis
   - [ ] Trauma/Injury

3. [ ] Asthma
   - [ ] HIV Infection
   - [ ] Pneumonia
   - [ ] Trichomoniasis

4. [ ] Conjunctivitis
   - [ ] Intestinal Parasites
   - [ ] Pulmonary TB
   - [ ] Urinary Tract Inf.

5. [ ] Diarrhea
   - [ ] Malaria
   - [ ] Upper Resp. Tract Infect.
   - [ ] Vaginal Bleeding

6. [ ] Fever of Unknown Origin
   - [ ] Malnutrition
   - [ ] Skin Disorders
   - [ ] Other:

#### Problems Removed:

1. [ ] Measles

### Lab Orders:

- [ ] Malarial Smear
- [ ] Urine Pregnancy Test
- [ ] Blood Sugar (Glucose)
- [ ] HIV Test
- [ ] Haemoglobin
- [ ] Syphilis (VDRL)
- [ ] Urinalysis
- [ ] Sputum AFB
  - [ ] Gm Stain
- [ ] Stool O&C
- [ ] Other:

### Lab Results:

- **Malaria:** ○ - ○ + ○ ++ ○ +++ ○ ++++
- **AFB:** ○ - ○ + ○ ++ ○ +++ ○ ++++
- **Pregnancy:** ○ Neg. ○ Pos. ○ Indeterminate
- **Stool O&C:** ○ Neg. ○ Pos. _________
- **HIV Test:** ○ Neg. ○ Pos. ○ Indeterminate
- **Sputum Gram Stain:** ○ Neg. ○ Pos.
- **VDRL:** ○ Non-Reactive ○ Reactive

### Radiology:

- **Blood Sugar:** [ ] mmol/dL
- **Haemoglobin:** [ ] g/dL
- **Hematocrit:** [ ] %
- **Other:**

### Referrals:

### Pharmacy:

### Recommendations:

---

*Courtesy of Andrew Kanter. Used with permission.*
Terminology Service Bureau - 50,000 concepts

Viewing Concept Anaemia

Filter Concepts by: All Concepts

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- AMPATH: 3
- SNOMED CT: 271737000
- ICD-10-WHO: D64.9
- AMPATH: 6030

Version: false

Created By: Doctor Super User - November 3, 2007 12:00:00 AM UTC

Changed By: Doctor Super User - April 25, 2010 1:22:45 PM UTC

Courtesy of Andrew Kanter. Used with permission.
The proposed research systematically evaluates the impact of all MGV-Net components (e.g. ChildCount+; OpenMRS) on various aspects of the healthcare delivery system including:

- service coverage;
- quality of services;
- early detection, referral, and treatment of danger signs;
- morbidity and mortality;
- management of resources (human, financial, etc).
OASIS II Study Design

- Mixed methods
- Retrospective Case-Control- exposure to on-time CHW visits
- Repeated Measures with & without MGV-Net
- Action Research Component
- Repeated Measures of Paper vs. SMS
## Malaria in Uganda - Action Research

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<th>Key measure of success</th>
<th>Pre-intervention</th>
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<td>Patients treated who were not tested or tested negative</td>
<td>90%</td>
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<tr>
<td>Patients treated who tested negative</td>
<td>48%</td>
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<tr>
<td>Patients treated who tested positive</td>
<td>10%</td>
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# Malaria in Uganda - Action Research

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<th>Key measure of success</th>
<th>Pre-intervention</th>
<th>Post-intervention</th>
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<td>Patients treated who were not tested or tested negative</td>
<td>90%</td>
<td>32%</td>
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<tr>
<td>Patients treated who tested negative</td>
<td>48%</td>
<td>12% in Q1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>18% in Q4</td>
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<td>Patients treated who tested positive</td>
<td>10%</td>
<td>30% in Q1</td>
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<td>58% in Q4</td>
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Challenges and Lessons Learned

- Human capacity
- Clinician engagement
- Reliable electricity, computers, connectivity
- Need interoperability
- Need maturity model
- Gov’t policies
Shared Terminology and Resources

- www.maternalconceptlab.com
- www.openmrs.org
- www.childcount.org