

The Open Medical Record System (OpenMRS)



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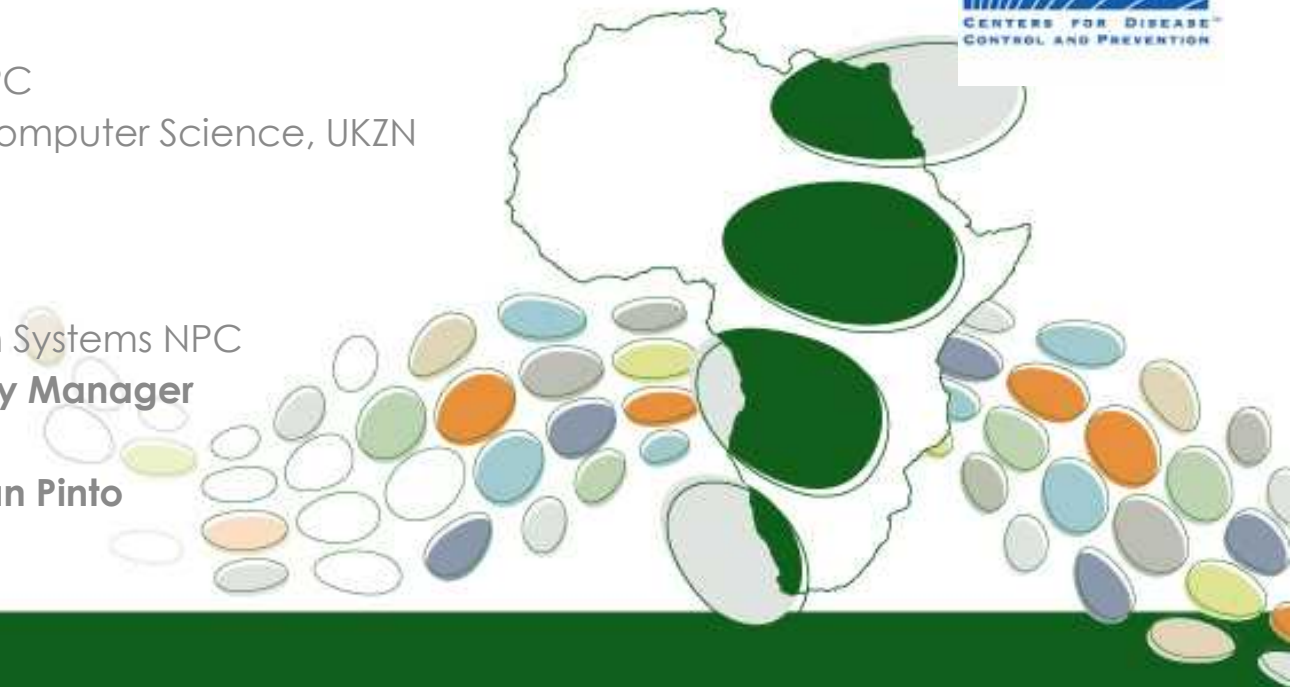
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OpenMRS Overview

What is OpenMRS?

- Open source **medical record system**
- Started in 2004 to support Kenya AMPATH facilities
- Built by a team of **developers, informaticists, and implementers** across the world
 - *South Africa, Kenya, Rwanda, Lesotho, Zimbabwe, Mozambique, Uganda, Tanzania, Haiti, India, China, United States, Pakistan, the Philippines, and many other places*



Mission

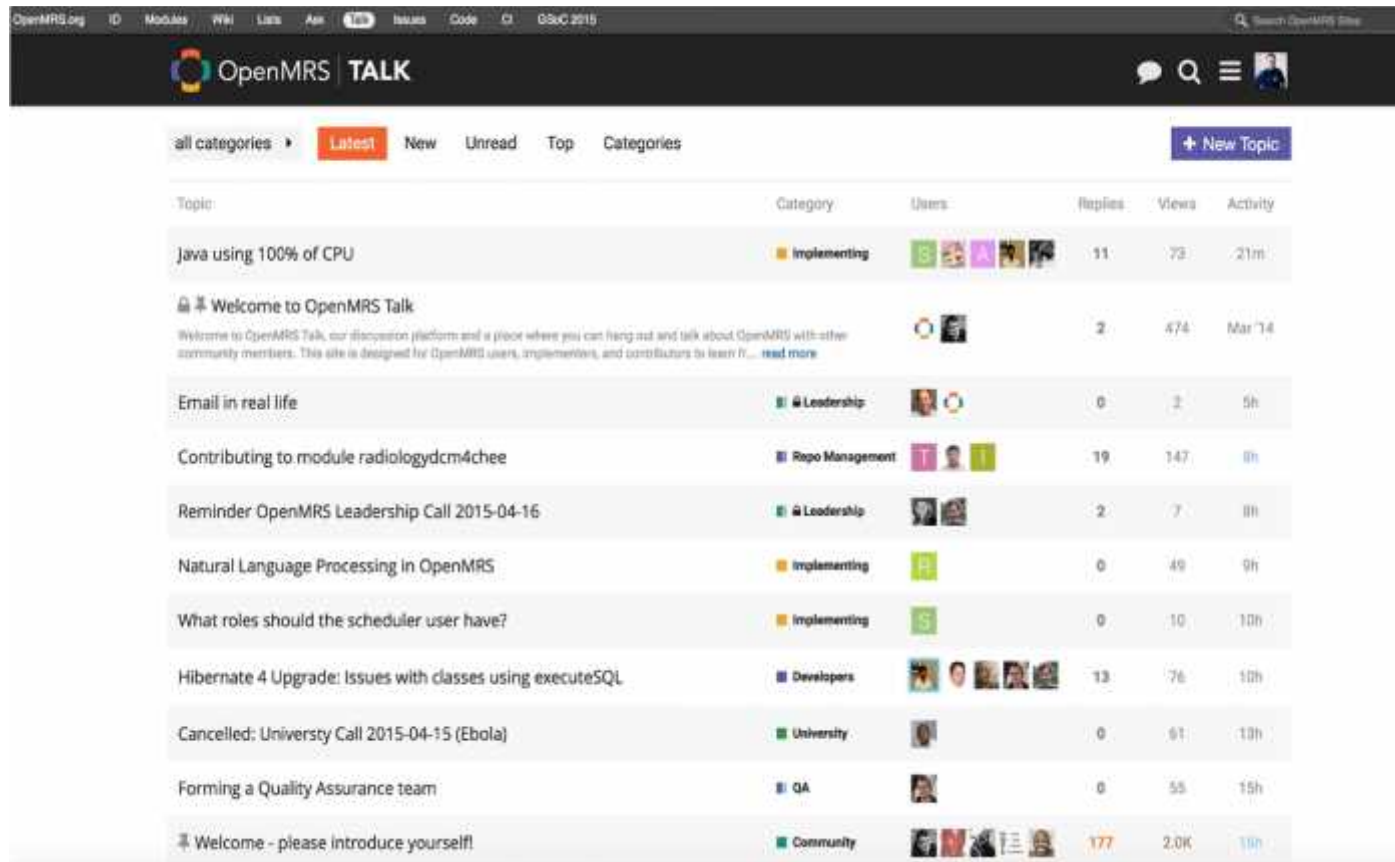
to improve healthcare delivery in resource-constrained environments by coordinating a global community that creates a robust, scalable, user-driven, open source medical record system platform



OpenMRS clinical and research locations as of 2011



OpenMRS Community Development Process



The screenshot displays the OpenMRS TALK forum interface. At the top, there is a navigation bar with links to OpenMRS.org, ID, Modules, Wiki, Lists, Announcements, Issues, Code, and CI. A search bar is located on the right. Below the navigation bar, the forum is categorized by 'all categories' with tabs for 'Latest', 'New', 'Unread', 'Top', and 'Categories'. A '+ New Topic' button is also present. The main content area lists various discussion topics with columns for Topic, Category, Users, Replies, Views, and Activity.

Topic	Category	Users	Replies	Views	Activity
Java using 100% of CPU	Implementing	B, A, A, A, A	11	73	21m
Welcome to OpenMRS Talk Welcome to OpenMRS Talk, our discussion platform and a place where you can hang out and talk about OpenMRS with other community members. This site is designed for OpenMRS users, implementers, and contributors to learn from... read more					
Email in real life	Leadership	A, C	0	2	5h
Contributing to module radiologydcm4chee	Repo Management	T, A, I	19	147	8h
Reminder OpenMRS Leadership Call 2015-04-16	Leadership	A, A	2	7	8h
Natural Language Processing in OpenMRS	Implementing	P	0	49	9h
What roles should the scheduler user have?	Implementing	S	0	10	10h
Hibernate 4 Upgrade: Issues with classes using executeSQL	Developers	A, A, A, A, A	13	76	10h
Cancelled: Universty Call 2015-04-15 (Ebola)	University	A	0	61	13h
Forming a Quality Assurance team	QA	A	0	55	15h
Welcome - please introduce yourself!					



OpenMRS Platform API

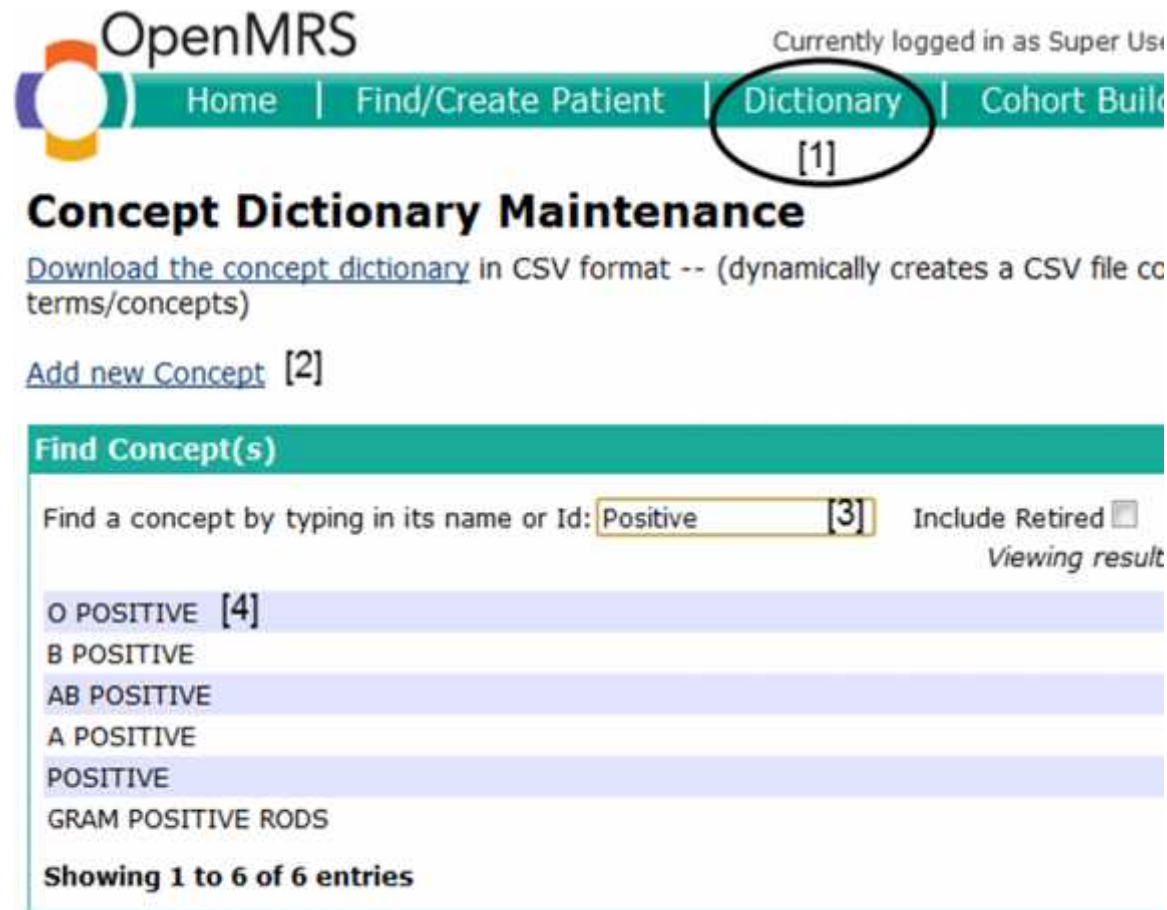
Three code layers

- Database Layer
 - Service Layer
 - Presentation layer
- Hibernate, Spring, AJAX





Concept Management



OpenMRS

Currently logged in as Super User

Home | Find/Create Patient | **Dictionary** | Cohort Builder

[1]

Concept Dictionary Maintenance

[Download the concept dictionary](#) in CSV format -- (dynamically creates a CSV file containing terms/concepts)

[Add new Concept](#) [2]

Find Concept(s)

Find a concept by typing in its name or Id: [3] Include Retired ☐

Viewing results

- O POSITIVE [4]
- B POSITIVE
- AB POSITIVE
- A POSITIVE
- POSITIVE
- GRAM POSITIVE RODS

Showing 1 to 6 of 6 entries



Original OpenMRS Forms Entry

The screenshot shows the OpenMRS web interface in a Mozilla Firefox browser. The patient's name is Horatio L. Hornblower, with an OpenMRS ID of 101-6. The interface includes tabs for Overview, Regimens, Encounters, Demographics, Graphs, and Forms. The 'Encounters' tab is active, displaying a table of the last three encounters. Below this, the 'Forms' section lists various medical forms available for entry, such as '01. Basic Form (v.0.1) (Unpublished)' and '02. ADULT PATIENT REGISTRATION (v.0.1)'.

OpenMRS - Mozilla Firefox

http://localhost:8080/openmrs/patientDashboard.form?patientID=20&phrase=hor

OpenMRS

Currently logged in as Super User | [Logout](#) | [Help](#)

Home | Find Patient | Dictionary | Administration | Patient Groups | My Profile

Horatio L. Hornblower OpenMRS Identification Number: **101-6**

65 yrs (May 1, 1941) | Tribe: Unknown | [Summary](#) | South African National ID Number: 1941987454637 | [Amend](#)

Weight: | CD4: | Regimen:

Last encounter: **ADULTINITIAL @ Unknown Location, Jan 4, 2007**

Overview | Regimens | Encounters | Demographics | Graphs | Forms

Last Three Encounters

Edit	View	Encounter Date	Encounter Type	Provider	Form	Location	Enterer
		1/4/07	ADULTINITIAL	Super User	14. TB PATIENT TREATMENT CARD	Unknown Location	Super User
		1/1/07	ADULTINITIAL	Joan McCosh	03. ADULT BASELINE CLINICAL EXAMINATION	Richmond	Joan McCosh
		12/31/06	ADULTINITIAL	Super User	02. ADULT PATIENT REGISTRATION	Unknown Location	Super User

Forms

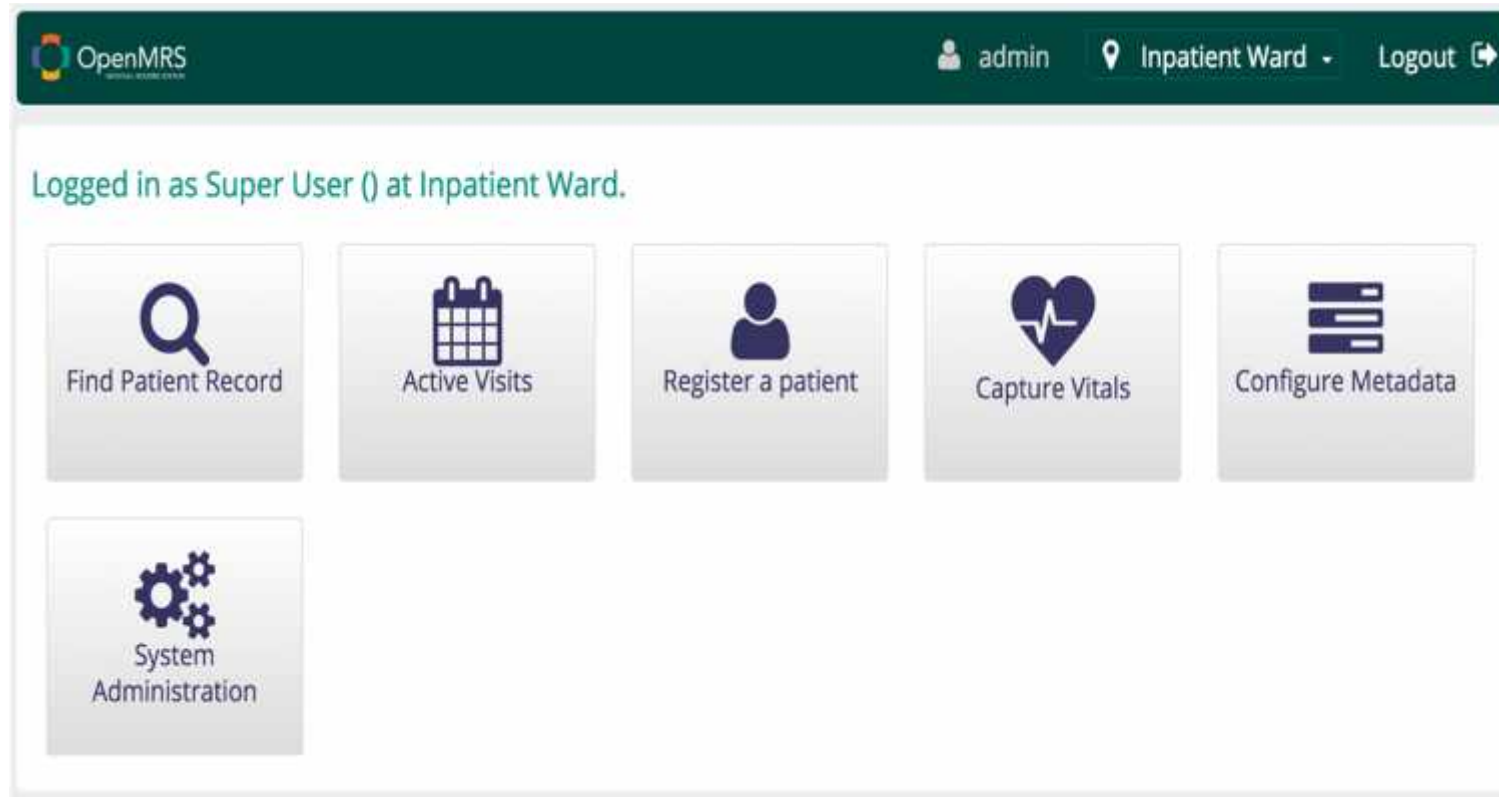
Results for **. Viewing 1-14 of 14

01. Basic Form (v.0.1) (Unpublished)
02. ADULT PATIENT REGISTRATION (v.0.1)
03. ADULT BASELINE CLINICAL EXAMINATION (v.0.1)
14. TB PATIENT TREATMENT CARD (v.0.1) (Unpublished)
- ADULT BASELINE LABORATORY RESULTS (v.0.1) (Unpublished)
- ADULT INITIATION/CHANGE OF TREATMENT (v.0.1) (Unpublished)
- ADULT PATIENT CHECKLIST (v.0.1) (Unpublished)
- ADULT PATIENT COUNSELLING FORM (v.0.1) (Unpublished)
- ADULT PATIENT EVALUATION FORM (v.0.1) (Unpublished)

Done



OpenMRS Reference Application



OpenMRS Reference Application

The screenshot displays the OpenMRS Reference Application interface for a patient named Jackie Tran. The top navigation bar includes the OpenMRS logo, a user profile for 'admin', the location 'Inpatient Ward', and a 'Logout' button. The patient's name 'Tran, Jackie' is shown with a breadcrumb trail. Below this, patient details include 'Male 23 year(s) (~15.Feb.1992)', an 'Edit' link, a 'Show Contact Info' dropdown, and the 'Patient ID 100CN4'. A status bar indicates an 'Active Visit - 15 Apr 2015 04:08 AM' and the patient is 'Inpatient at Inpatient Ward'.

The main content area is divided into several sections:

- DIAGNOSIS:** Lists 'Resume building', 'bronchitis', and 'Cough'.
- VISITS:** Shows a visit from 'Yesterday' with a status of 'Active - Inpatient'.
- ALLERGIES:** Lists 'Unknown'.
- VITALS:** Titled 'Last Vitals: Yesterday 05:57 PM', it lists various measurements: Height (cm) 183cm, Weight (kg) 68kg, (Calculated) BMI 20.3, Temperature (C) 37°C, Pulse 72/min, Respiratory rate 72/min, Blood Pressure 120 / 100, and Blood oxygen saturation 90%.
- Current Visit Actions:** A list of actions including 'Test Form', 'test1', 'upload image', 'End Visit', 'Visit Note', 'Exit from Inpatient', 'Transfer To Ward/Service', and 'Capture Vitals'.
- General Actions:** A list of actions including 'Add Past Visit', 'Merge Visits', 'Test Admission Form', 'Test New Admit', 'Test vitals', and 'upload image'.



OpenMRS Modules

[Admin](#) | [Manage Modules](#) | [Module Properties](#)






Modules

NOTE: Adding, removing, or starting modules will restart OpenMRS

Add or Upgrade Module

Check for Upgrades

Manage Modules

Action	Name	Version	Author	Description
[1]  [3] 	Serialization Xstream	0.2.5	luzhuangwei	Core (de)seria
	Logic Module	0.5	OpenMRS	...
[2]  	Clinical Summary Module [Not Started]	2.0	Ben Wolfe	Very Basic Op administration



HOSPITAL IMPLEMENTATIONS



Hospital Implementation at Mirebelais (Haiti)

Zanmi Lasante admin Outpatient Clinic Logout

Areias, Darius Visits

Areias, Darius
Male 43 year(s) Active Visit

Patient ID: Y2A4G4
Nirreans Dosye: A002598
HIVEMRI-V1 Add

Visits Contact Information Request Paper Record

01 Mar 2013 (active since 07:32 AM)
Cholera
13 Feb 2013 - 13 Feb 2013
No diagnosis yet.
11 Feb 2013 - 11 Feb 2013
No diagnosis yet.
07 Feb 2013 - 07 Feb 2013
No diagnosis yet.
02 Oct 1980 - 02 Oct 1980
No diagnosis yet.

Active Visit Started at 01 Mar 2013 07:32 AM

Write Consult Note Order X-Ray Record Vitals

Encounters

07:33 AM 01 Mar 2013
Radiology Order by Super User in Outpatient Clinic show details

07:33 AM 01 Mar 2013
Consultation by Super User in Outpatient Clinic show details

07:32 AM 01 Mar 2013
Vitals by Super User in Outpatient Clinic hide details

Height 1.75m
Weight 75.0kg
(Calculated) BMI Patient's BMI is: 24.5
Temperature 37.0°C



Hospital Implementation in Bahmni

Bahmni is an easy to use, open source hospital system for healthcare providers in low-resource settings

Developed by ThoughtWorks, Inc

Combines three open source products into a single solution

- OpenMRS for electronic medical records
- OpenERP for hospital operations
- OpenELIS for laboratory information management


System interoperates by messaging to support various workflows

- Lab results are sent to OpenMRS from OpenELIS
- Invoices are generated in OpenERP for lab tests



Bahmni (OpenMRS Patient Dashboard)

Patients

 **Ranga Billa (GAN214597)** - Male, 23 Years 5 Months 16 Days
Achalpur

Diagnosis

Fever	CONFIRMED PRIMARY	13 Mar 15
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Lab Results
No Lab Orders for this patient.

Radiology
No radiology documents for this patient.

Admission Details
No Admission Details for this patient.

Nutritional Values
13 Mar 15 02:05 PM

HEIGHT	35
WEIGHT	60
BMI	489.8
BMI STATUS	Very Severely Obese

Vitals
No Vitals for this patient.

Treatments
Visit on 13 Mar 15

Hepatitis - B 10ml	10 Tablet(s), Once a day, 10 Day(s)	13 Mar 15
--------------------	-------------------------------------	-----------

Visits


13 Mar 15 - 13 Mar 15	OPD
10 Mar 15 - 10 Mar 15	OPD

Breast Cancer
Breast Cancer - Intake 13 Mar 15
13 Mar 15
Pathology

Pathology Report Date	2015-03-18
Pathologic Diagnosis	Invasive Ductal Carcinoma



Bahmni (OpenELIS Dashboard)


Laboratory Information System
 Version: 3.1 (-)

[Lab Dashboard](#)
[Sample](#)
[Patient](#)
[Non Conformity](#)
[Results](#)
[Validation](#)
[Reports](#)
[Upload](#)
[Administration](#)
[Help](#)

[Refresh](#)
Today's Stats
Awaiting Testing : 1
Awaiting Validation : 0
Completed : 0
Total : 1
Total Patients Today : 0

[Today](#)
[Backlog](#)

Accession Number	PatientID	PatientName	Pending Tests	Pending Validation	Total	Action	Printed
	1455						
30122014-002	GAN214558	Manaraj Lingh	3	0	3	Result Validate Print	✓
30122014-001	GAN214557	Athul Raj	17	0	17	Result Validate Print	
28012015-004	GAN214554	nithin middha	4	0	4	Result Validate Print	
25022015-001	GAN214557	Athul Raj	13	0	13	Result Validate Print	
16122014-002	GAN214555	Ravinder Kumar	7	0	12	Result Validate Print	
16122014-001	GAN214554	nithin middha	3	0	3	Result Validate Print	



Bahmni (OpenERP Payments Page)

OpenERP

Customer Payments

1-12 of 12

S.No.	Date	Number	Ref #	Partner	Journal	Total	Status	Cashier
1	08/04/2015	BNK1/2015/55190		Deepthi C [GAN214526]	Cash (NR)	0.00	Posted	Demo User
2	25/03/2015	BNK1/2015/55189		new patient [GAN214528]	Cash (NR)	15.00	Posted	Demo User
3	25/03/2015	BNK1/2015/55188		new patient [GAN214528]	Cash (NR)	0.00	Posted	Demo User
4	25/03/2015	BNK1/2015/55187		new patient [GAN214528]	Cash (NR)	0.00	Posted	Demo User
5	25/03/2015	BNK1/2015/55186		abhinav peddada [GAN214532]	Cash (NR)	0.00	Posted	Demo User
6	18/03/2015	BNK1/2015/55185		abhinav peddada [GAN214532]	Cash (NR)	40.00	Posted	Administrator
7	11/03/2015	BNK1/2015/55184		Vivek Gaji [GAN214537]	Cash (NR)	80.00	Posted	Demo User
8	11/03/2015	BNK1/2015/55183		Mujir S [GAN214530]	Cash (NR)	80.00	Posted	Administrator
9	11/03/2015	BNK1/2015/55182		Raghavendra Kumar [GAN214525]	Cash (NR)	125.00	Posted	Administrator
10	11/03/2015	BNK1/2015/55181		abhinav peddada [GAN214532]	Cash (NR)	130.00	Posted	Administrator
11	15/12/2014	BNK1/2014/55180		Darshu Jayyeri [GAN214538]	Cash (NR)	260.00	Posted	Demo User
12	05/08/2014	BNK1/2014/55179		Raghavendra Kumar [GAN214525]	Cash (NR)	10.00	Posted	Administrator
						890.00		

Powered by OpenERP



REGIONAL COMMUNITIES



Original OpenMRS Community



OpenMRS Community



OpenMRS Mozambique (eSaude)

Funded by



One of the first official regional OpenMRS communities (along with Kenya)

Still a very young community - just over 1 year old

Community was established in order to

- Harmonize the work being done by USD funded organisations in the country (shared forms and reports)
- Share knowledge and resources amongst partners
- Establish a unified voice for interaction with global community

Implementing partners include Friends in Global Health (FGH), Chass-SMT, Chass-Niassa, EGPAF, ICAP, CCS, ARIEL

Base system (developed by FGH) is being used at the starting point and collects data HIV and produces reports in a standard format



OpenMRS Mozambique (eSaude)



Current uses

- Managing patients with HIV
- Data entry and reporting
- ARV register

Future uses

- Maternal & Child health
- Data integration into national reporting system
- Pharmacy module



OpenMRS Mozambique (eSaude)



Implementation Guidelines

- First output of community collaboration
- Defines best practices and standard operating procedures for implementing OpenMRS in the Mozambican context
- Input from all implementing partners
- Made available for use to countries that might have a similar implementing environment



OpenMRS Mozambique (eSaude)



Data Migration Tool

- Tool developed by community to migrate to OpenMRS from their previous Access-based system
- Built generic enough to be usable for migration from other system
- Open source and released publicly on GitHub
- Extensions to the tool proposed as a Google Summer of Code project



OpenMRS Mozambique (eSaude)



Point of Care

- The next community project
- Currently in the planning phase
- First step will be to implement patient registration workflow



OpenMRS-DHIS2 Interoperability

Number of iterations, all developed as OpenMRS modules

Latest module, developed as part of GSoC has gained community support

Works by aggregating data in OpenMRS using Cohort queries, then populates DXF files and posts to DHIS2 via the API



References

Cooking Up An Open Source EMR For Developing Countries:
OpenMRS – A Recipe For Successful Collaboration

The OpenMRS Implementers Network

The OpenMRS System: Collaborating Toward an Open Source
EMR for Developing Countries

<http://scholar.google.com> “OpenMRS” for more



Jembi Funders of this Work

- Rockefeller Foundation
- Canadian International Development Research Centre (IDRC)
- United States President's Emergency Plan for AIDS Relief
- United States Centres for Disease Control and Prevention



Thank you



Mozambique

Avenida Julius Nyerere no 3326
Condominio Diplomatic Village
Casa numero um
Maputo

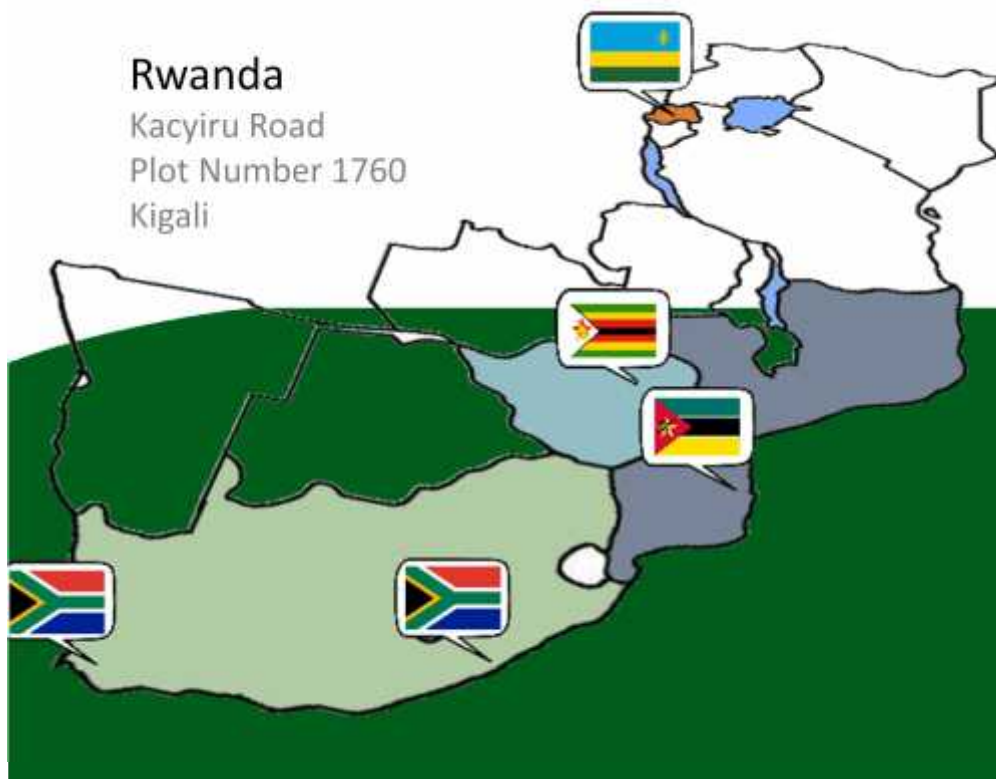
Rwanda

Kacyiru Road
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Kigali

South Africa

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