REPUBLIC OF MOZAMBIQUE
MINISTRY OF HEALTH

e-Health in Africa- Travelling at Speed into the 21st Century

Example of Mozambique

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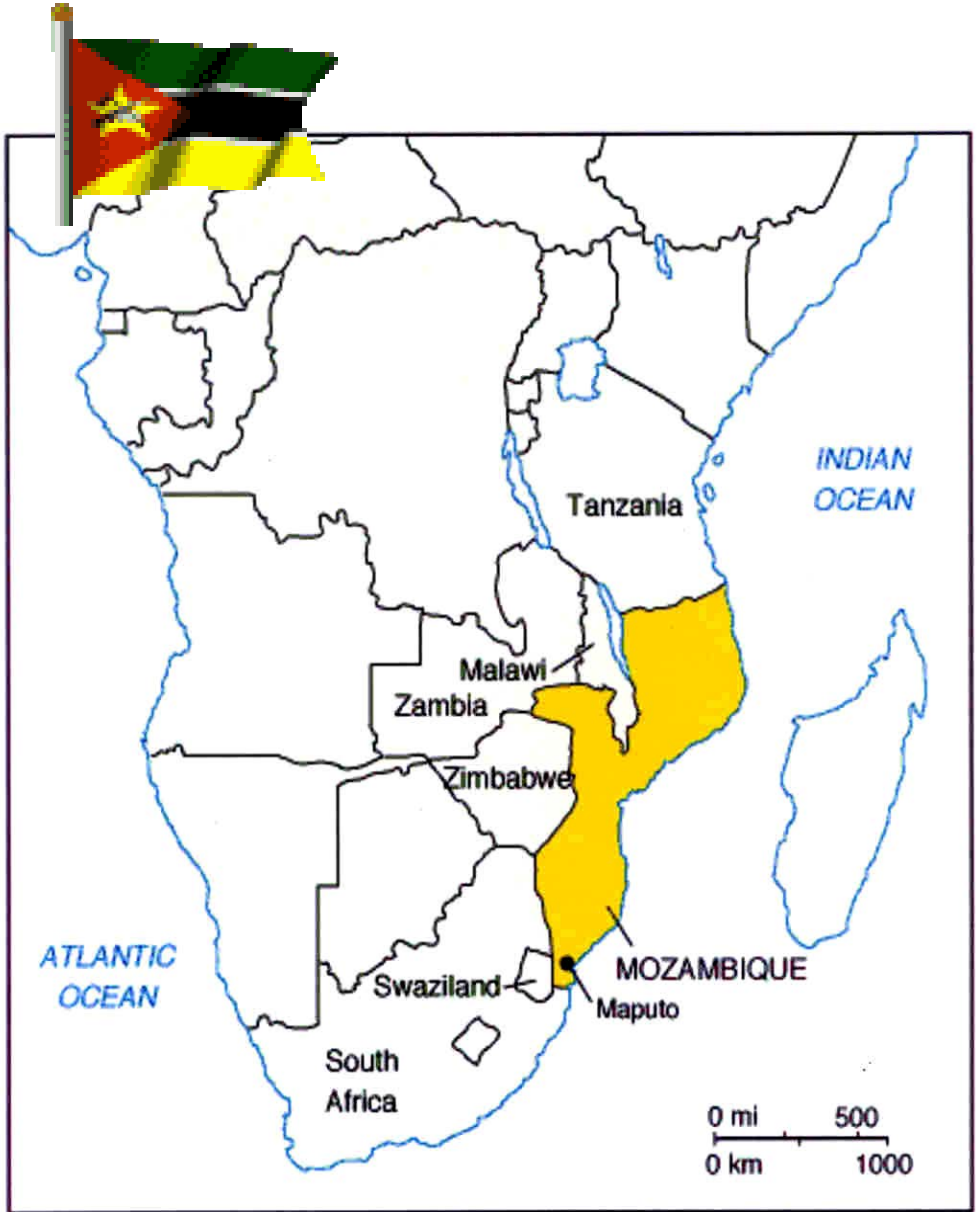
Health, Wealth, Innovation Conference **Moray, 18 September 2012**

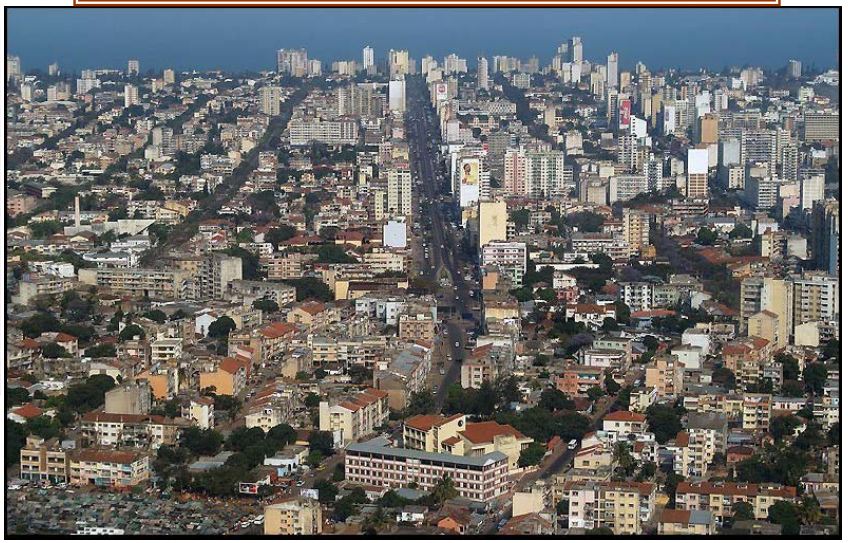
Outline

1. Mozambique health system at a glance
2. e-health initiatives
   - policy
   - m-health
   - health information systems
   - e-learning
   - telemedicine
3. Gaps and perspectives



GEOGRAPHICAL LOCATION
Mozambique is located in South-eastern Africa covering a surface area of 799,380 square kilometers.

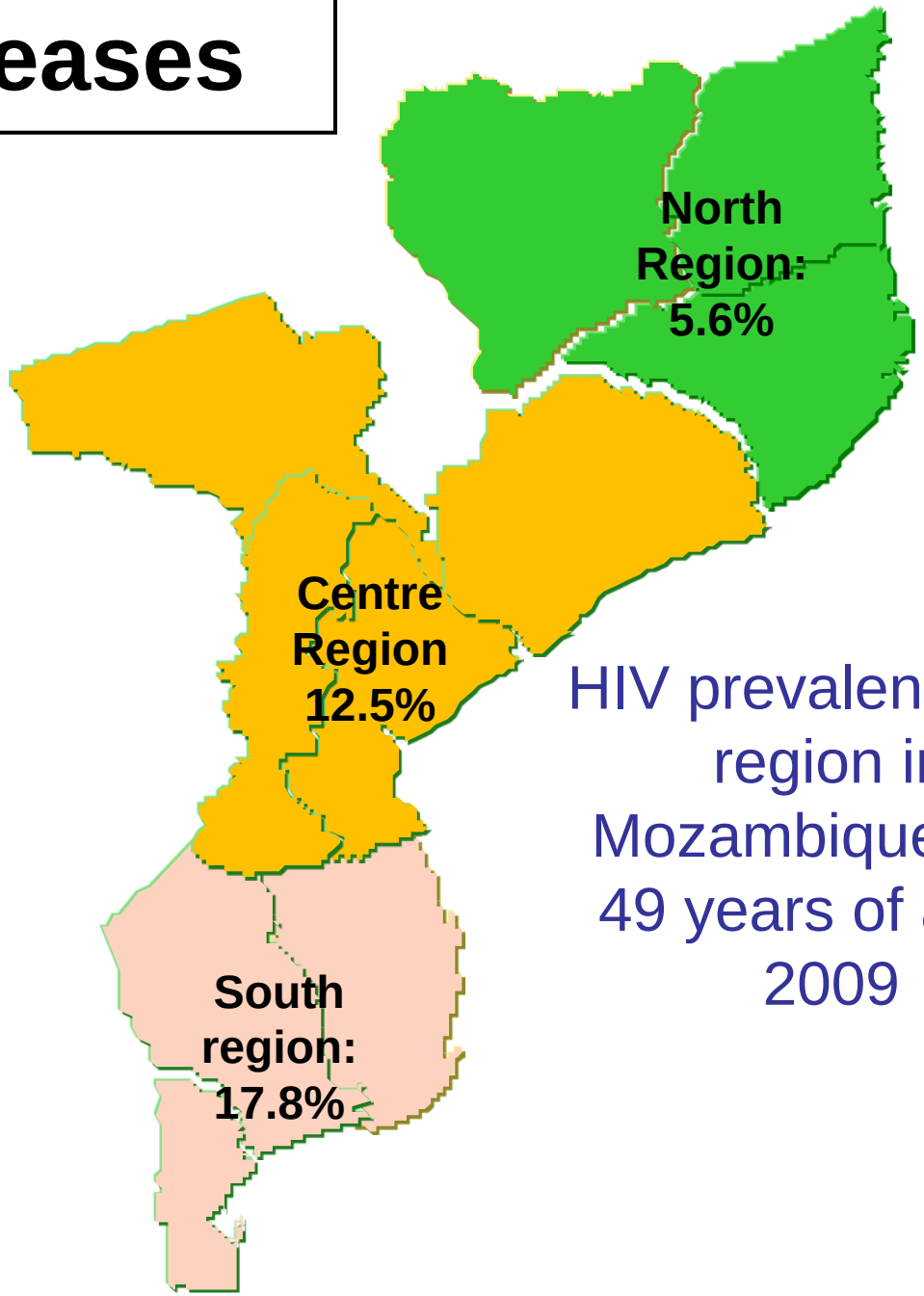
Capital City - Maputo



Socio-Demographic Information	
Population	23.7 million
Annual growth	2.5%
Fecundity	6.2
Rural population	62%
Poverty index	54.7%
GDP per capita	USD 843
GDP growth	5.7%

Principal Diseases

- Infectiouses diseases and particularly
- Malaria
- Tuberculosis
- HIV and
- other Intestinal and Vesical Parasitic diseases are the major burden



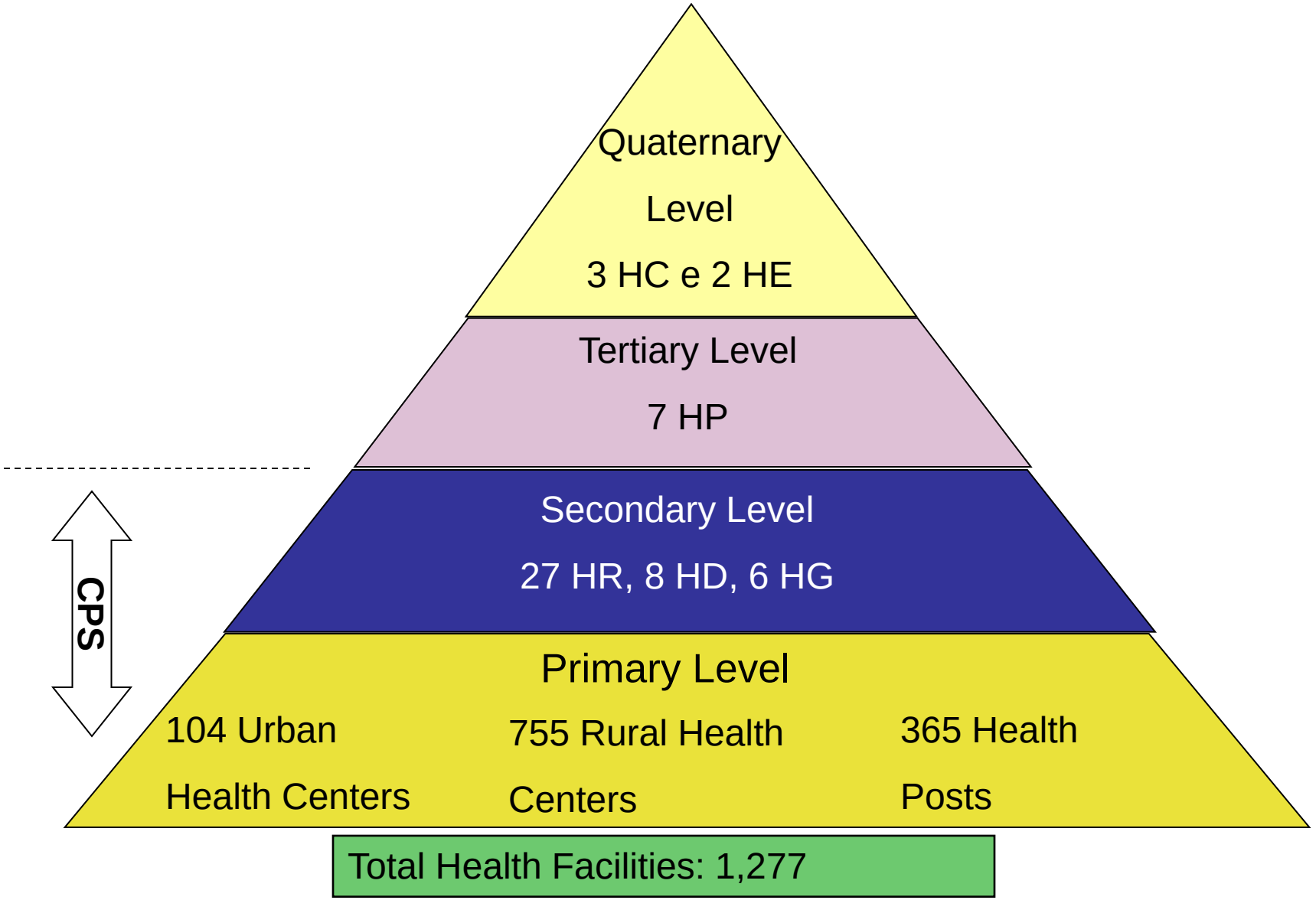
HIV prevalence per region in Mozambique (15-49 years of age)- 2009

Source: INSIDA, 2009

Health Net-Care Distribution

New General Hospital - Nacala-Porto-2010

Health Network Distribution per Care Level



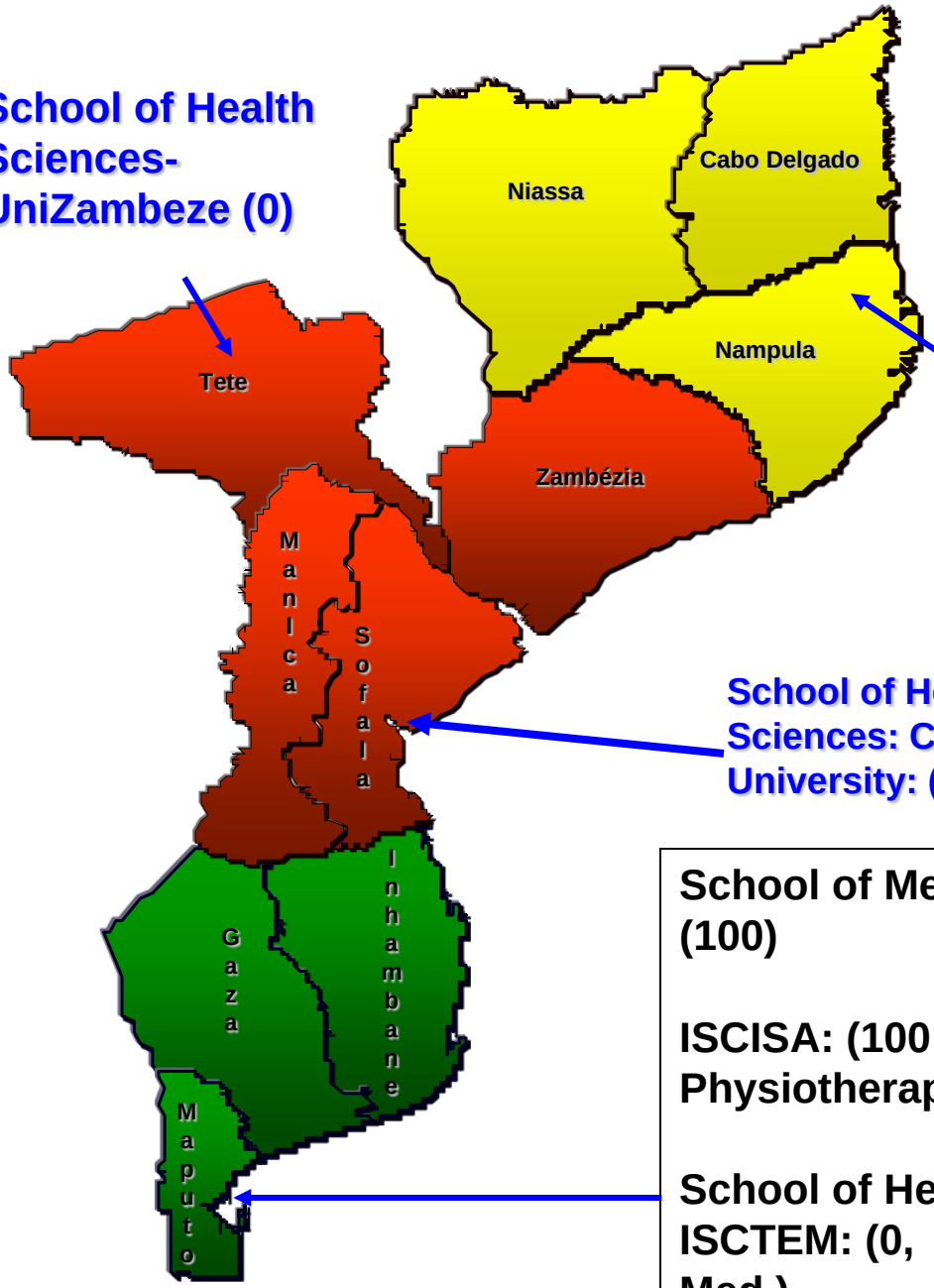
Source: Service Availability Mapping, 2007

Ministry of Health's Training Network

CFS Lichinga
CFS Cuamba
CFS Mocimboa da Praia
CFS Tete
Niassa
Cabo Delgado
CFS de Pemba
Nampula
Tete
Monapo e Alua Annexes
Zambézia
ICS Nampula
CFS Chimoio
Manica
Sofala
CFS Mocuba
ICS Quelimane
CFS Nhamatanda
ICS Beira
CFS Massinga
Gaza
Inhambane
CFS Inhambane
Chicuque Annex
CFS Chicumbane
Maputo
ICS Maputo
Training Department- MISAU

Source: DRH/Formação 2010

Ministry of Health, and Private Sector Training Network for Higher Level Technicians



School of Medicine of UEM: (100)

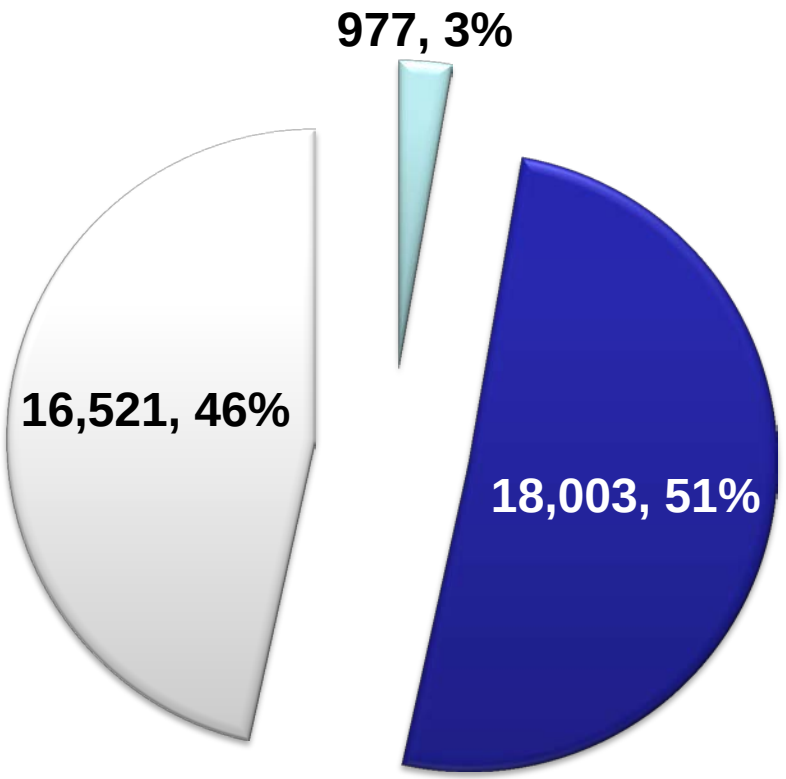
ISCISA: (100 Nursing, Physiotherapy, etc.)

School of Health Sciences of ISCTEM: (0, Pharmacy, Dent. Med.)

Health Workforce Profile

In

Health Workforce Distribution per Type of Cadre

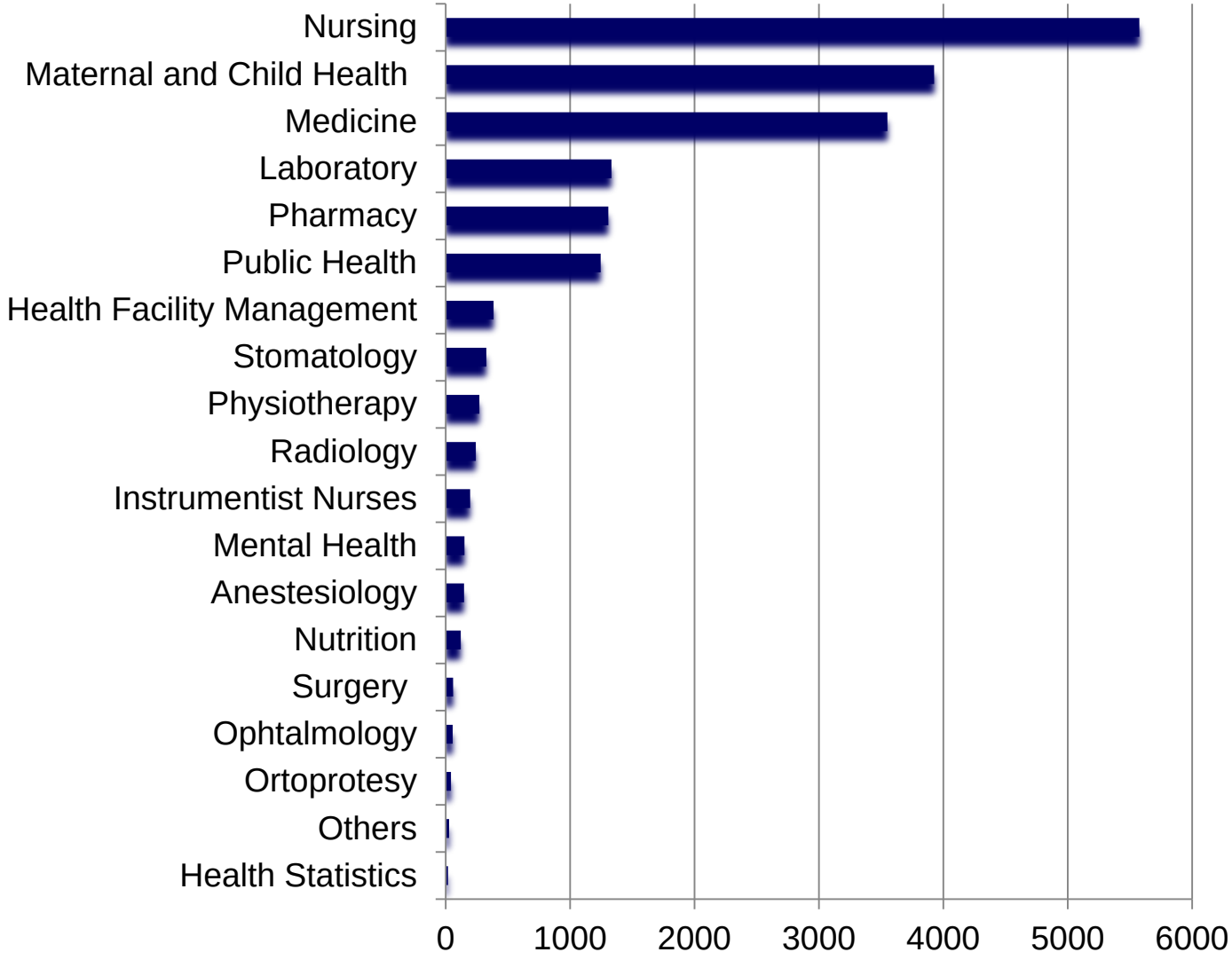


Total : 35,501

- Doctors
- Para medical cadre
- Support cadre

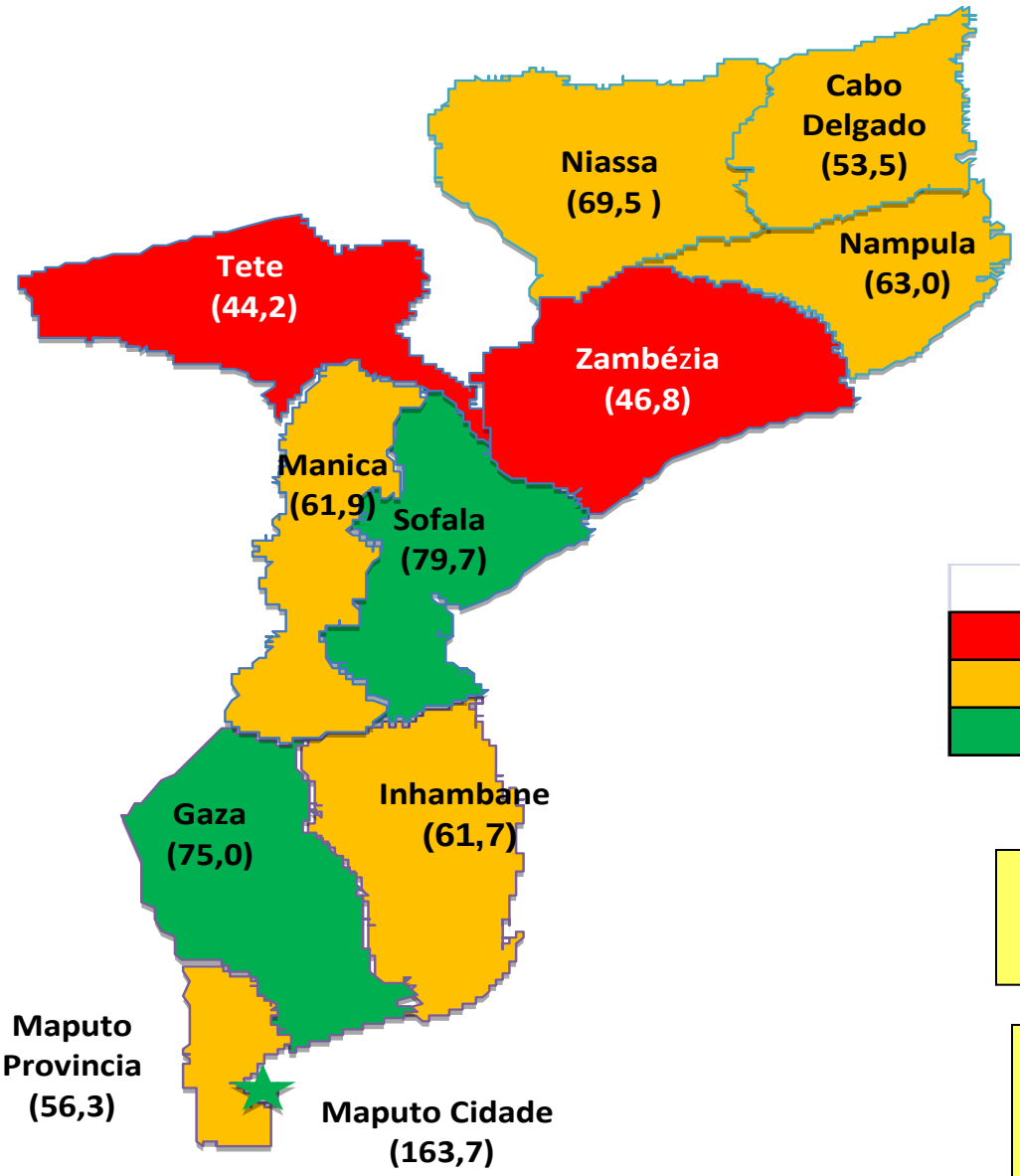
Source: DRH, 2011

Health Workers Distribution per Occupation (n=18,980)



Source: Relatório Anual DRH, 2011

Density of Health Workers (Medicine, Nursing and MCH)/ 100,000 inhabitants per Province



	Density p 100,000
	(<50)
	(50,0 - 69,9)
	(>= 70)

National Average 64.5/100,000

WHO Reccomendation 230/100,000

Source: DRH, 2011

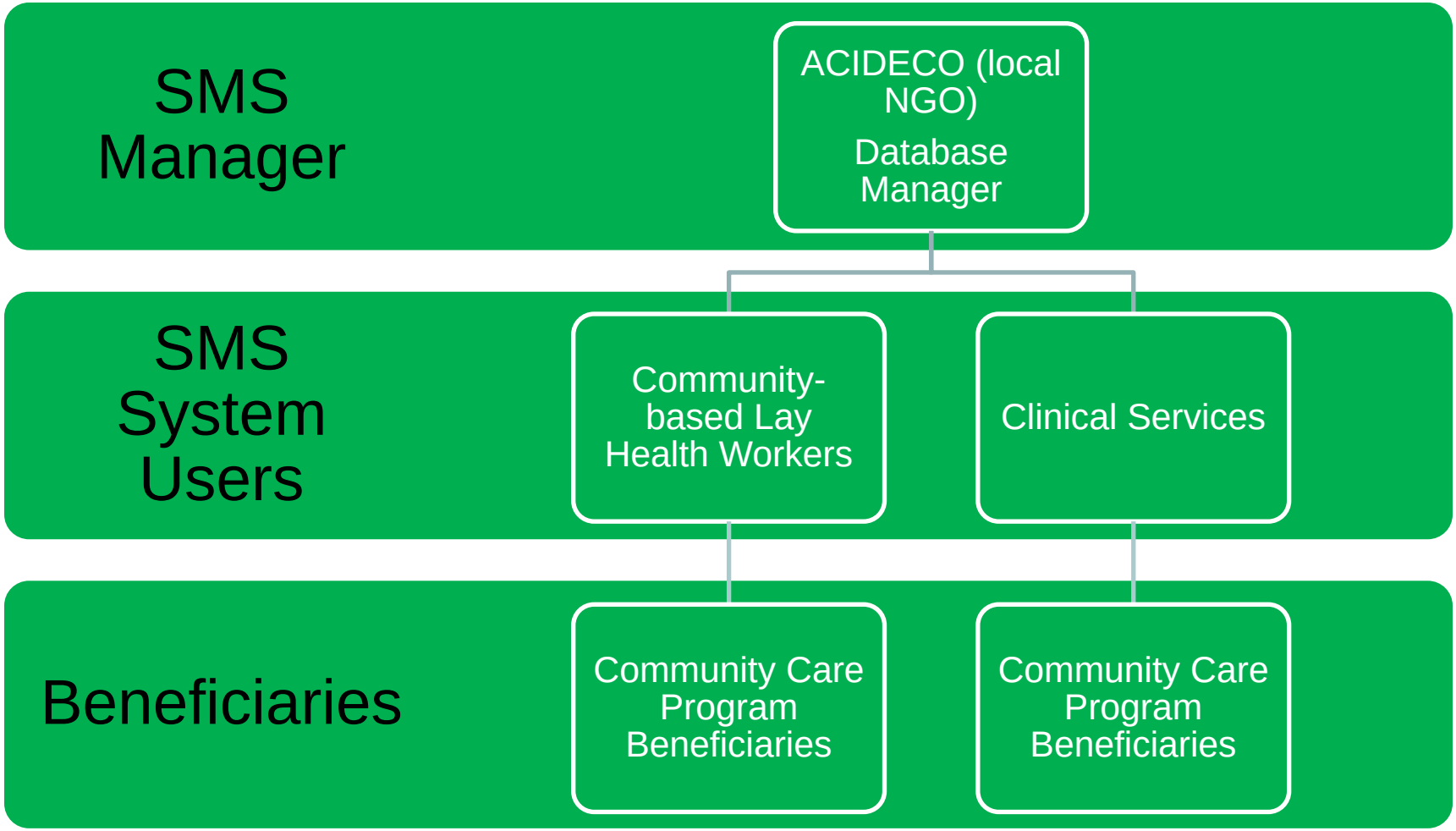
e-Health Policy

- Existence of national policy on e-Government but not yet for e-Health nor telemedicine
- Existence of a legal framework to
  - Maintain confidentiality of personal data
  - Protect personal data specifically in the Electronic Medical Record or Electronic Health Record

m-Health Initiatives

- Public private partnership with cellphones providers and national landline company: Mcel and Vodacom
- Support from US Government through FHI360
  - HIV+ Patient support – includes supporting patient adherence and retention rates (pilot- May 2012)
- Support from Dutch and US. Governments through PSI
  - Eco-system– includes health and safety SMS messages to HIV+ patients (pilot- August 2012)
- Support from Absolute Return for Kids (ARK) and DFID for evaluation and scale up of
  - SMS reminders & educational messages for HIV+ patients on antiretroviral therapy (ART) and HIV+ pregnant women to improve their adherence to care
- Support from Clinton Foundation- Irish Aid- FICA- UNICEF and US Government for scale up
  - Quick results' return of Early infant HIV diagnosis with PCR printers (since 2009, scaled-up)
  - CD4 count follow-up results (since 2009, scaled-up)

Community Care Program SMS Flow



SMS Reminders into community-based programming

Beneficiary´s quote: “Even if I do not receive a personal visit by the *lay* health workers at my house, the text messages are their replacement, what I call a mobile visit to my home”.

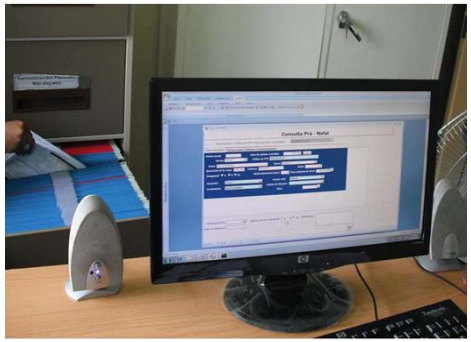
- The message options range from preventive behavior messages, virtual encouragement to continue their ART regimen, reminders for follow-up clinic visits etc.

SM*Saúde*: Study of SMS Reminders on ART & PMTCT

- Evaluation of SMS reminders to improve HIV treatment adherence and prevention of mother to child transmission of HIV (PMTCT)

- Randomized control trial was launched in November, 2011 and will continue until May, 2013
  - 1,352 HIV+ patients on antiretroviral therapy (ART) and HIV+ pregnant women in Maputo Province
  - Patients will be monitored for 12 months to assess the impact of SMSs on health outcomes (including HIV transmission to children) and HIV treatment adherence.

SM*Saúde*: How do the SMS reminders work?



Electronic patient record database is connected to the SMS platform to send automatic regular reminders to patients

Modem in health facility used to send SMSs

Patients receive regular messages reminding them of appointments

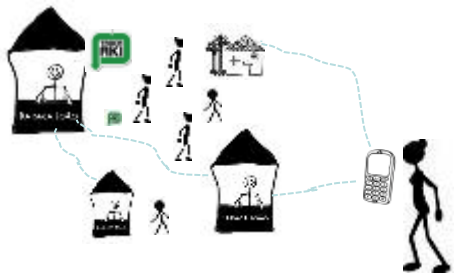
HIV+ pregnant women also receive educational messages about the importance of antenatal & post-natal care, institutional birth and infant testing for HIV

Movercado : How Does it Work ?

Rather than hiring thousands of activistas, PSI is using Movercado to create a activista marketplace, allowing rapid scale-up and instant payment on performance without the need for investment in traditional supervision and control. As a bonus, we get instant reporting, access to beneficiary insights and virtually no admin/ processing costs.

Using a combination of vouchers and personalized information, Movercado will engage the beneficiary in an interactive, long-term, increasingly complex dialogue that will further increase the accuracy of targeting algorithms and will allow us to learn more about the beneficiary. She is, really, a phone-call away.

This is all about unlocking opportunities by removing or reducing the cash-flow barrier at the bottom of the pyramid. Movercado is running a voucher system branded TrocaAki. Essentially, we will pay shops for products given to beneficiaries by validating an encripted code. A voucher.



The voucher program (branded **Troca Aki**) creates growth for the outlet.

In exchange for this business, the shop will be required to stock a list of health commodities (condoms, water purification products, etc) and will be incentivized to actively promote these products.

The use of vouchers is removing a significant **cash-flow barrier** – the beneficiary gets the product and the outlet gets the money. The increased demand will provide growth for the shop, which will be reinvested in stocks. This will strengthen the pipeline, which will make it more attractive for other businesses.

But there is more::

WFP, UNICEF, etc are doing food and non-food distribution. They run parallel, expensive, inefficient supply chains that disrupt fragile local markets. We are happy to make this pipeline available to them – we issue as many vouchers they need for any products they need to distribute and all they have to do is get the codes to their beneficiaries (by SMS, by paper, no matter). We ensure that the national distributors push the right products through the pipelines (easy, since demand and cash-flow are no issues) and all of a sudden, the local shops are thriving. This could even work in emergency response situations, when we could issue “flash“ voucher codes by radio.

Movercado : The eco-system backbone

A platform that enables highly complex, algorithm-driven interactions by means of SMS.

The focus is on the interaction, not the technology.
Beneficiary experience and business logic drive design. The technology is almost invisible to the user.

Movercado runs algorithms that ensure that every interaction is personalized and its personalization increases with the complexity of the interaction.

Every new interaction is an opportunity to learn more about the beneficiary and to increase the relevance of next interaction

Movercado is a platform, not an application.
It is designed to run any number of applications, from the very complex to plain gimmicky.

Movercado is built around the idea that the impact of any interaction increases with the increase in personalization and relevance of the interaction.

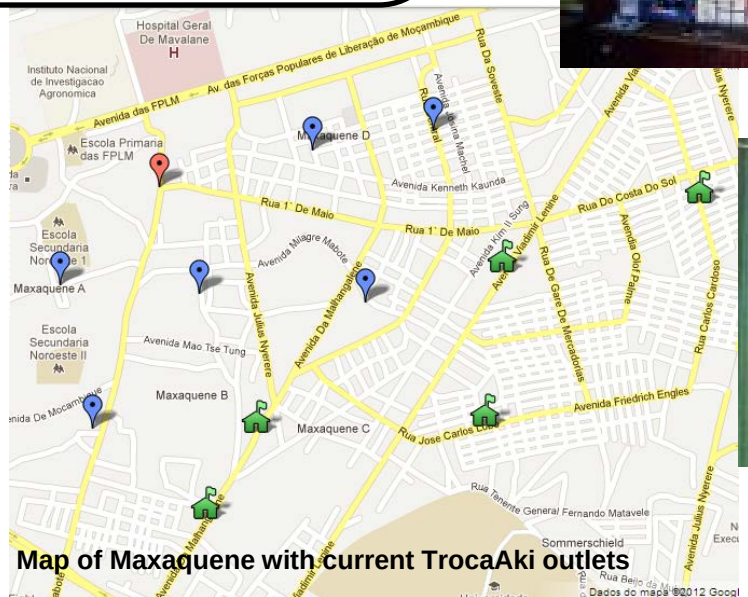
In other words, a highly relevant message received at the right place and right time is more likely to have an impact than a generic message received at a random moment.

Impact and ROI increase exponentially with the size of the eco-system.

Nice theory, But how about the practice?

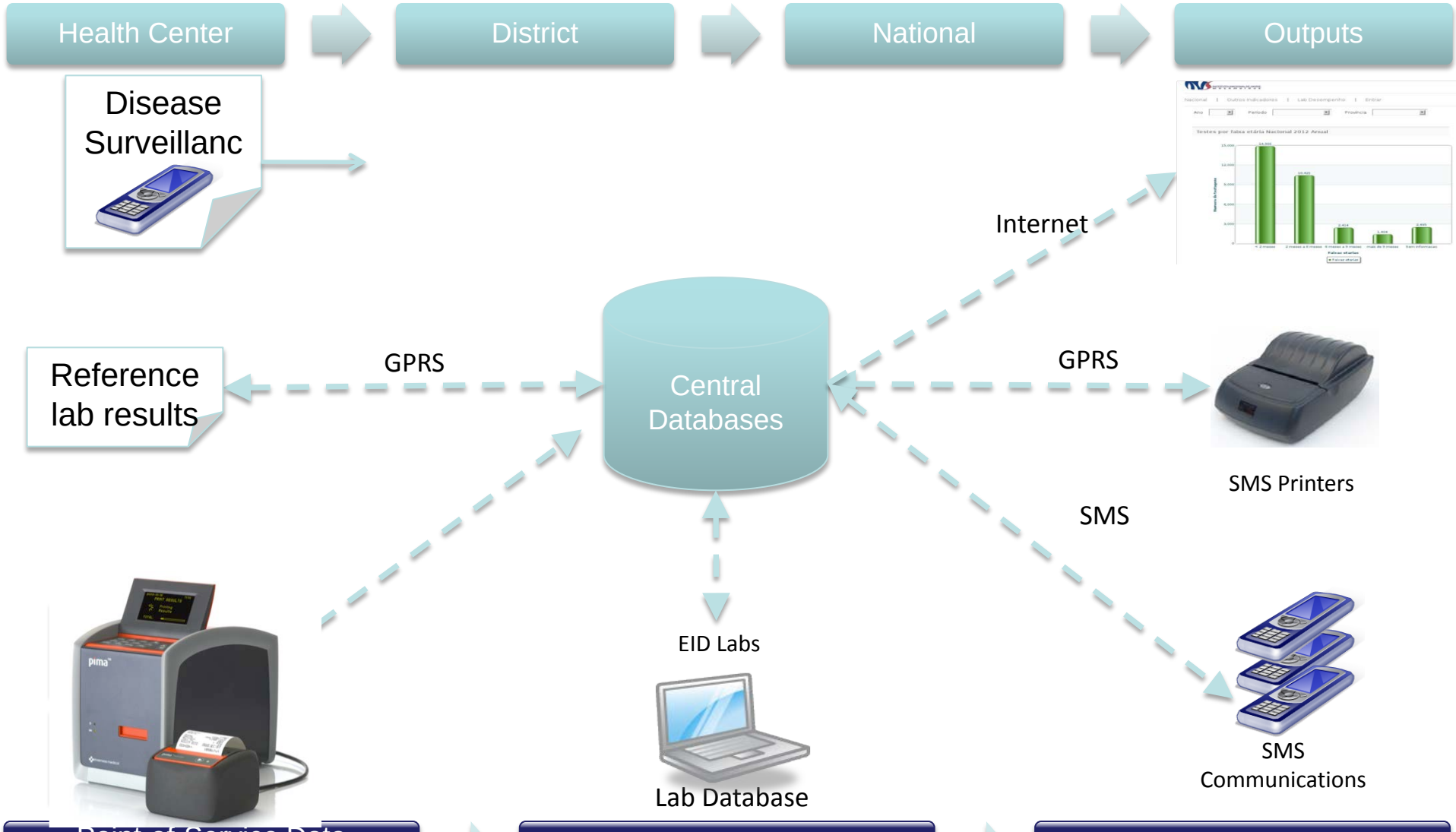
Movercado is live as of August 2012. Here are the numbers three weeks after going live in three Bairros in Maputo, Sofala and Tete:

Total beneficiaries registered	615
Total number of active agents	80
Total number of Troca Aki outlets	31
Total number of Troca aki voucher redeemed	171
% of voucher redeemed vs number of movercado registrations	28%



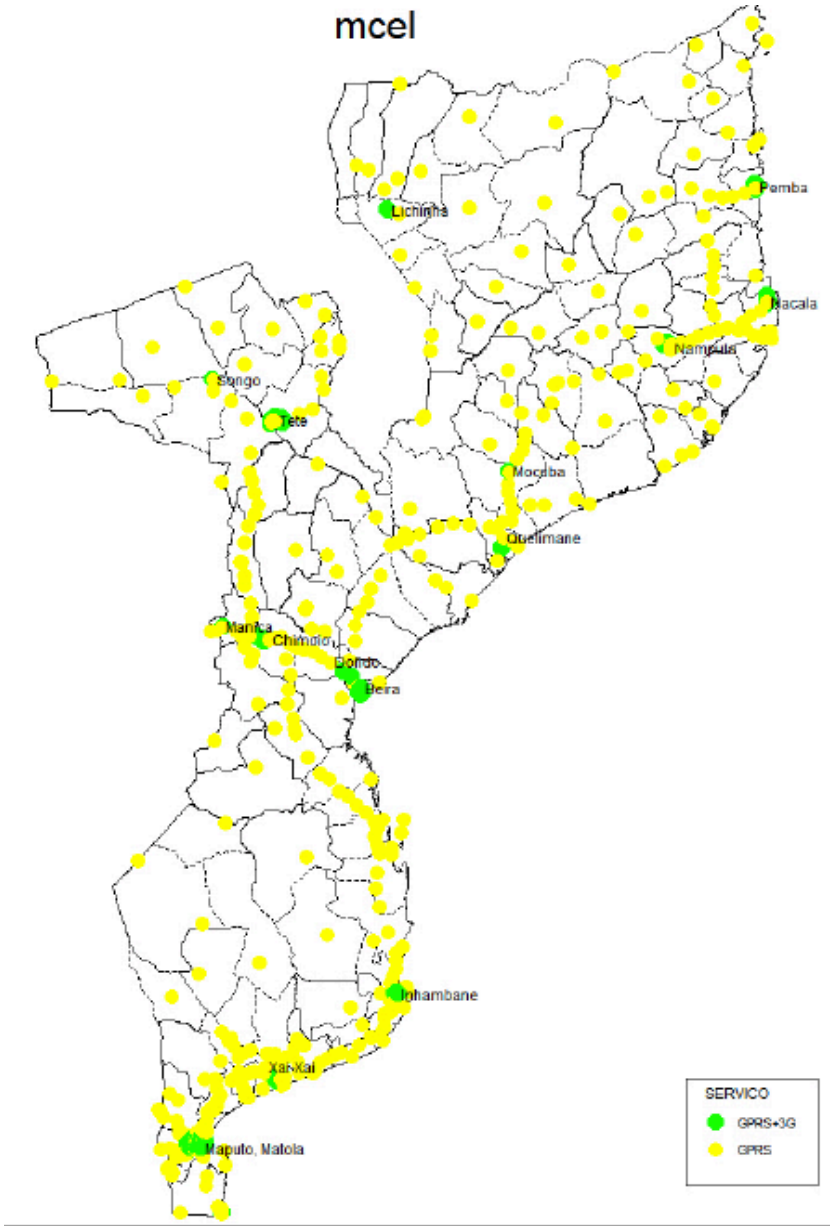
Map of Maxaquene with current TrocaAki outlets

MCH-Net: A Connectivity Solution



SMS Printer System using Cell phone network

- 402 Health Centers have SMS Printers today
- 96% of Early Infant Diagnosis (EID) results are sent via SMS
- In April 2012, 60% of results were delivered back to the health center within 28 days of sample collection
- Tuberculosis results will be transmitted via the SMS printers starting in Q4 2012.



Helping Mozambique reach people in need of testing and treatment

New technologies and communications have improved the National HIV Program, especially for women and children. Technologies and connectivity help the health system to overcome challenges such as reaching remote rural populations for testing and treatment and managing limited human resources.

The National SMS Printer System enables immediate delivery of Early Infant Diagnosis laboratory results from the reference laboratory to a printer in the health center via an MCEL GPRS connection.

The rapidly returned results ensure that HIV-infected infants are initiated to life-saving treatment faster.

The CD-4 PIMA device enables immediate delivery of CD-4 diagnostics to the patient at the health center.

A MCEL GPRS connection allows central monitoring of the device, the user, and stock levels.

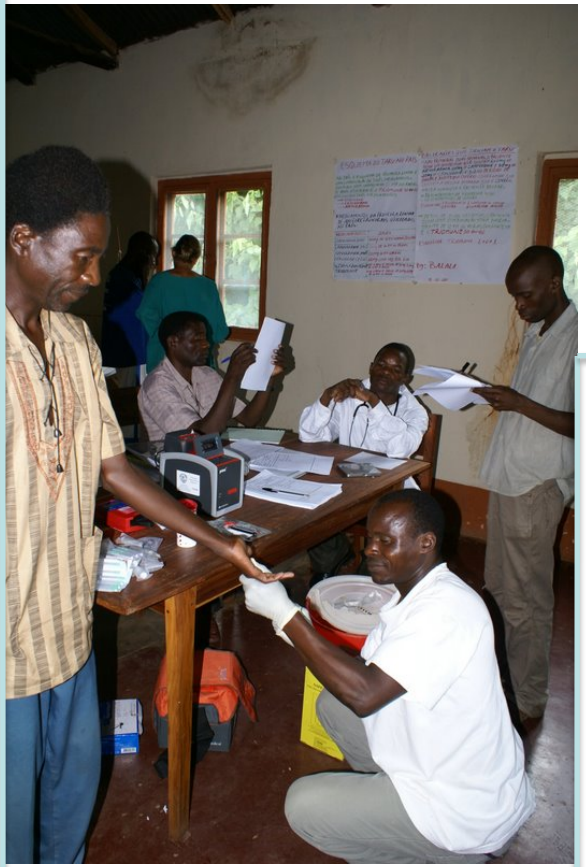
The rapidly returned results ensure that people who need treatment can receive it the same day.

The Field Perspective

Feedback:

•Clinicians impressed and excited about the new possibilities: Identification and complete staging –possible all in the same day.

•Real and immediate impact to patients' quality of life:



Mr. J. – Cobue

Needs to walk 8 hours to get to the health post. Visited the site on this day to pick up his ARV refill. Since his last CD4 was 8 months ago, the community HCW performed a CD4 and the doctor reviewed the result on the same day.

Mrs. A. – Metangula

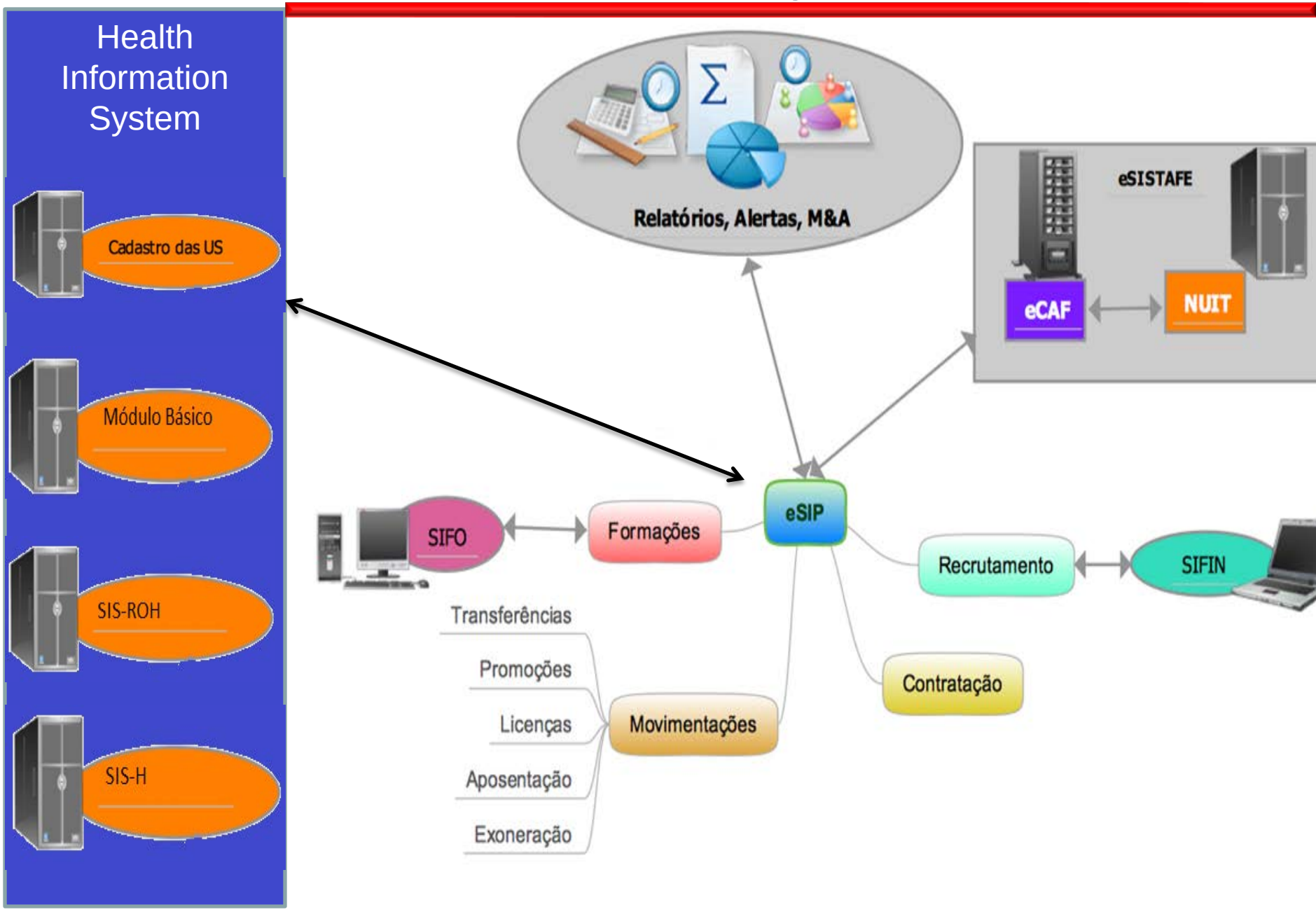
"It will help me a lot not to come too many times to the health center since I live 4 hours away by foot. Some times I have come to my consultation just to be told that my CD4 result has not come back yet from the [reference] lab in Lichinga"

Health Information Systems

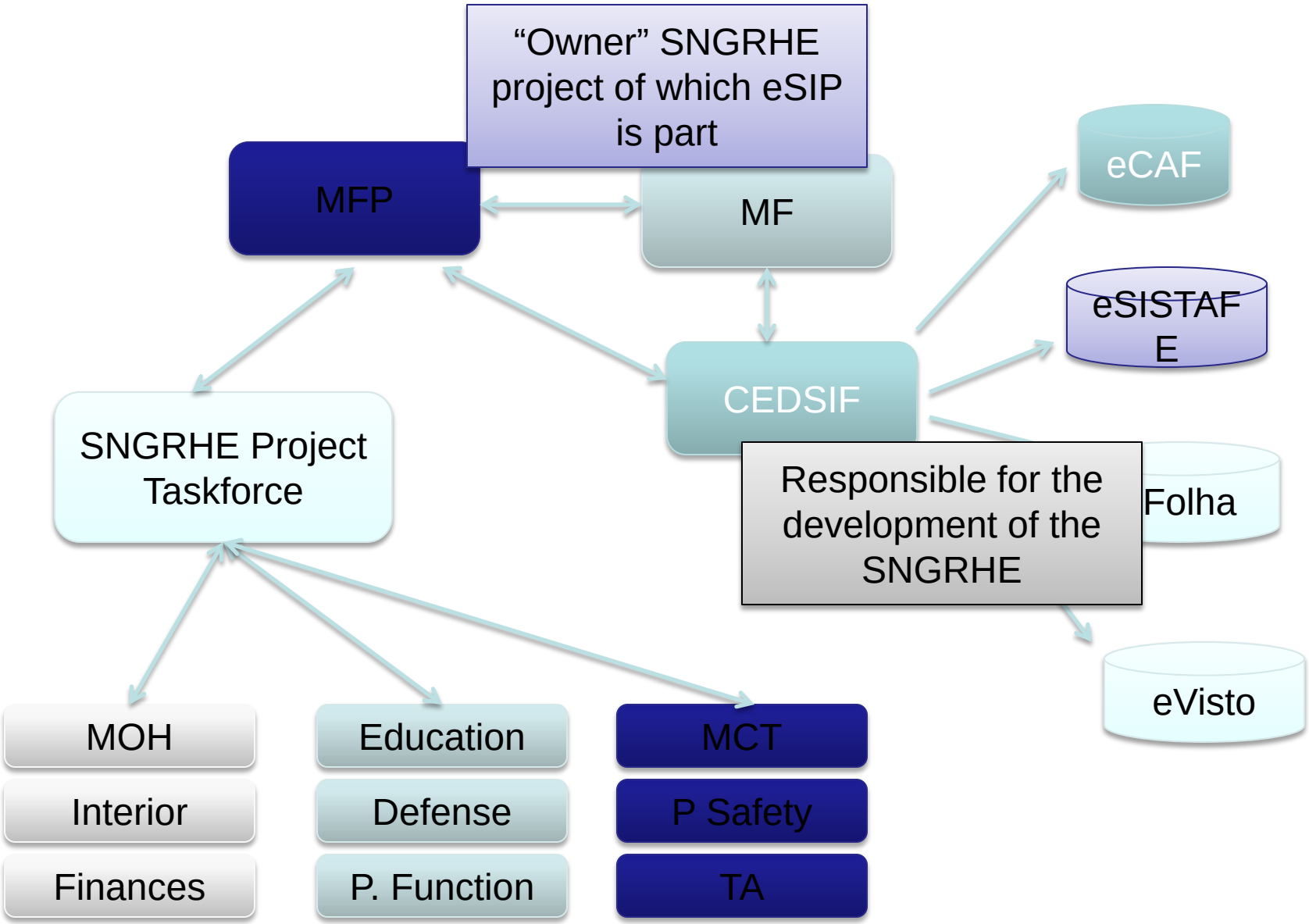
1. National M&E systems: *Modulo Básico* and new reengineered system- to start operations in September 2012
2. National Mortality system- since 2009
3. National data repository and data warehouse
4. National IT infrastructure and communication system for health
5. Central Hospital Information System – for tender
6. Hospital Information System based on data aggregation –design since 2010
7. Inventory of Infrastructure of Health Service
8. Electronic Record/Tracking Patient System
9. National supply chain system
10. Integration of subsystems
11. Army Forces Netbook system
12. Human Resource Information System (HRIS) – since 2011

All systems supported by US Government through MOASIS, SCMS, DOD and Jhpiego

Web-based e-HRIS: integrations with the MOH HIS



The e-HRIS as a part of the national HR information system



Logistics and Supply management systems Medicines, Reagents, diagnostics and other health consumables .

Central Warehouse E-Health Management

MACs System: A potent and dynamic Warehouse Management System creating an Secure and efficient environment

- This E-Heath approach is transforming the warehouses environment with a integral control and management of stock and data, maximizing the use of the existing resources – migration to a vertical multilayer palletized storing
- Powerful extractor for supporting the smart business products trends and risks
- Implementing a Central multi-warehouse database to archive the national control and management.

Logistics and Supply management systems Medicines, Reagents, diagnostics and other health consumables .

Provincial and District Warehouse E-Health Management

SIMAM Tool: A tailored solution for Logistics Management Information tool associated with the capacity of stock management and control

- This E-Heath solution is been a tool for controlling the stock movement across the country and aggregation of consumption data from the bottom of the supply chain and making it visible and useful for central management.
- Implemented in all the Provinces and rapidly Expanding to Districts Warehouses
- Using the available Cloud Computing solutions for data backup and sharing with central management team (Dropbox)
- Creating computer Literacy for computerize stock management and data supported decision making

Laboratory Network E-Health Management

Lab Tool: A tailored Logistics Management and Information tool Specific for Laboratory Reagents and Commodities

- This E-Heath system has shifted the reagents and laboratory management in the public health Laboratory Network.
- Consumption data for the reagents by laboratory
- Number of tests performed with the reagents (control)
- Support Distribution plans and actions required to be taken based on the MIS reports,
- Monitoring the Existing stocks and shelf life and
- Controlling the proof of deliveries by the suppliers (Direct delivered to Labs)

e-Learning

1. e-Portuguese and e-health library in Portuguese (BVS ePORTUGUESe) hosted by National Institute of Health (INS) since 2011
   - supported by WHO and BIREME
2. Distance clinical courses & clinical mentoring
   - supported by US Government through I-TECH (U. of Washington & U. of California, San Francisco) in collaboration with the U. of Eduardo Mondlane) since 2010
3. Blended-learning at Catholic University of Mozambique (UCM) since 2009
   - Supported by GIZ (German International Cooperation)

Biblioteca Virtual de Saúde em Moçambique

Rede ePORTUGUÊSe

biblioteca virtual em saúde

INSTITUTO NACIONAL DE SAÚDE
MOÇAMBIQUE

Contacto

Rede ePORTUGUÊSe

- Angola
- Brasil
- Cabo-Verde
- Guine-Bissau
- Portugal
- São-Tomé-Príncipe
- Timor-Leste

Redes Relacionadas

- BVS
- CVSP
- ePORTUGUESe
- GHL
- SciELO
- ScienTI
- TropIKA.net
- EVIPNet

Pesquisa na BVS Moçambique

Escreva com uma ou mais palavras

Pesquisar

Pesquisa via descritores DeCS/MeSH

Literatura Científica

Ciências da Saúde em Geral
RDSM- Rede Nacional de Informação de Saúde, MOZDOC-Centro de Documentação da OMS, AIM-African Index Medicus, AFRO Library, LILACS, MEDLINE, COCHRANE, SciELO

Áreas Especializadas
ADOLEC, BBO, BDENF, DESASTRES, HISA, HOMEOINDEX, LEYES, MEDCARIB, REPIDISCA

Organismos Internacionais
PAHO, WHOLIS

Acesso a Documentos

HINARI- Iniciativa de Acesso à Pesquisa

African Medical Journals

PLoS

Catálogo de revistas científicas

Diretórios, Portais

Diretório de eventos

Mapa da Rede BVS

LIS- ePORTUGUÊSe

DeCS- Terminologia em Saúde

Avisos

Bem vindos a BVS-Moçambique. Contribua com informação técnico-científica.

Destaques

XIV Jornadas de Saúde em Moçambique

MISAU

OMS- Representação em Moçambique

Notícias ECO ePORT

Cabo Verde: Comunicado de Imprensa do Escritório de Representação da OMS sobre a Formação em "One

Distance clinical courses & clinical mentoring

1. Hosting10-week certificate-level HIV courses broadcast from the University of Washington (UW) in English
2. Broadcasting certificate-level courses and clinical seminars from Maputo in Portuguese to provincial sites, based on UW clinical courses, in partnership with Eduardo Mondlane University (UEM): http://ghcss.org//

- 227 clinicians received certificate-level training to date
- >500 clinicians routinely receive info & updates

Distance clinical courses & clinical mentoring

1. Finalizing a webpage with a medical library for clinicians, including an interactive Q&A page: www.ensinoadistancia.edu.mz
2. Launching a toll-free clinical consultation ('warm') line, manned by expert clinicians, to provide anonymous medical advice to health care providers (by end of Sep)

Interdisciplinary Courses on HIV & AIDS and Health

- Blended Learning (online and presencial workshops combined)
- Providing a suitable atmosphere for studying on line
- Internet and field investigation
- Interaction with tutors

PESSOAS
Participantes
LISTA DE TÓPICOS

1

Módulo 1: Alcance e EPIDEMIOLOGIA do HIV/SIDA

- Boas Vindas: Módulo 1
- Pre teste e Pos teste

I. Unidade

Estudo

- Objectivos de Aprendizagem
- Texto de Apoio
- Estudo de Caso
- Autoavaliacao

Diálogo e Avaliação

- Quadro de Informação
- Fórum
- Chat A - Guilhermina, Sarmento, Obadias, David, Joaquim, Lidia, Alcino, Merino, Victor (Dra Sheila)
- Chat B - Aarao, Delso, Rogerio, Armando, Salvador, Claudia, Fernando, Sergio, Miguelhete, Jorge e Nadia (Dra Felismina)
- Trabalho de Investigacao
- Faça o Upload do seu Trabalho.
- Trabaho Exemplar M1U1

Courses

- Short course: 2.5 months duration
  - Result: 18 students
  - Local response course: to start in October 2012
- Bhons (Licenciatura): 1 year
  - 3 courses completed: 62 students, 48 (72%) graduated
  - 1 in course: 12 students

- Master Course: 2 years
  - Thesis (research)
  - Started in August 2012: 14 students

Telemedicine

- Various tentatives
  - 1998: project in Radiology data transmission between the Central Hospital of Maputo and Central Hospital of Beira (Center of Mozambique)
  - 2000: Radiology and clinical data transmission between the Central Hospital of Maputo and Central Hospital of Beira
  - ~2007: Cooperation agreement with India. Equipment installed at the Central Hospital of Maputo but not used
- Ongoing initiatives
  - In Cardiology, between Central Hospital of Maputo and a hospital in Porto (Portugal)
  - Anatomopathology, between Barcelone University and University of Eduardo Mondlane and Central Hospital of Maputo, real time diagnosis and in-service training

Gaps

- e-health policy
- Monitoring and evaluation capacity of data available in real time for decision making and prioritization of programming
- Issues with internet connectivity
- Use of telemedecine
- Skilled human resource
- Gap of financial resources to fully implement health information systems at national scale

Perspectives

- POCT provides a cost effective platform that could be built upon for other diseases
  - Diagnosis with DNA PCR to be scaled-up in 2013
  - Mobilization of resources for 3 to 5 years for national scale program
- Get the clinical mentoring and e-library services down to training instituions and health facilities
- 3G mobile telecommunication to allow internet connectivity in all districts
- Improve coordination between the MOH and partners implementing m-health programs to ensure sustainability and sharing of lessons and best practices
- Create clear policy supporting e-health in Mozambique

Khanimambo!
Obrigado!
Thank You!