GNU Health in the Public Health System

New Features in 3.0

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About GNU Solidario

"Delivering Health and Education with Free Software"

GNU Solidario first project :Santiago del Estero, Argentina, 2006

GNU Health
The Free Health and Hospital Information System.
(health.gnu.org)

IWEEE
International Workshop on E-Health in Emerging Economies.
(www.iweee.org)

GNU SOLIDARIO
EDUCATION AND HEALTH WITH FREE SOFTWARE

GNU Health : Functionality Areas

Person and Community

Person, family, Socioeconomics, lifestyle ...

Domiciliary Units, Operational Areas, Institutions,

Patient

Evaluations, Genetics, prescriptions, History, surgeries...

Health Institution Management

Hospitalizations, Finances, Laboratory, stock, HR, ..

Health Authorities / MoH

Health campaigns, epidemiology, ...
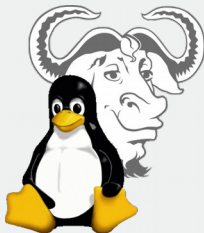
GNU Health is Free/Libre Software

Freedom to **run , adapt, improve and redistribute**

Official GNU Package, from the Free Software Foundation

Open Documentation

Relies on free technology

International community (100+ language teams)

GNU Health and Social Medicine

Child Vaccination on Kibati Camp - RDC - By Julien Harneis

Over 20000 Children die every day from Social Diseases
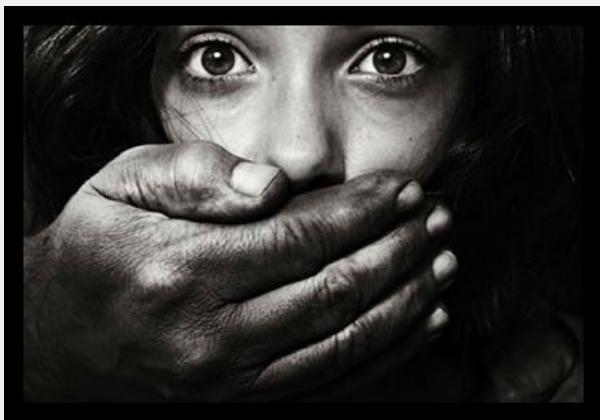
Human Trafficking
Contaminated Water
Malnutrition
Cholera
Drug abuse
Prostitution
Chagas
Tuberculosis
Ebola
Child Labour
War
Family Violence
Malaria
HIV
...

The System of Health Paradigm
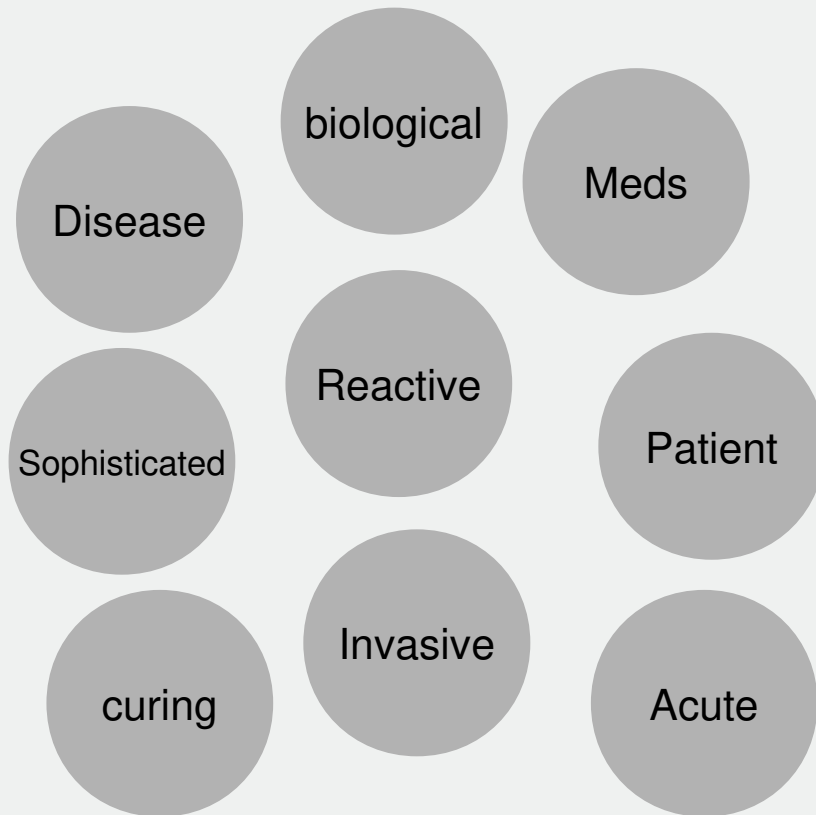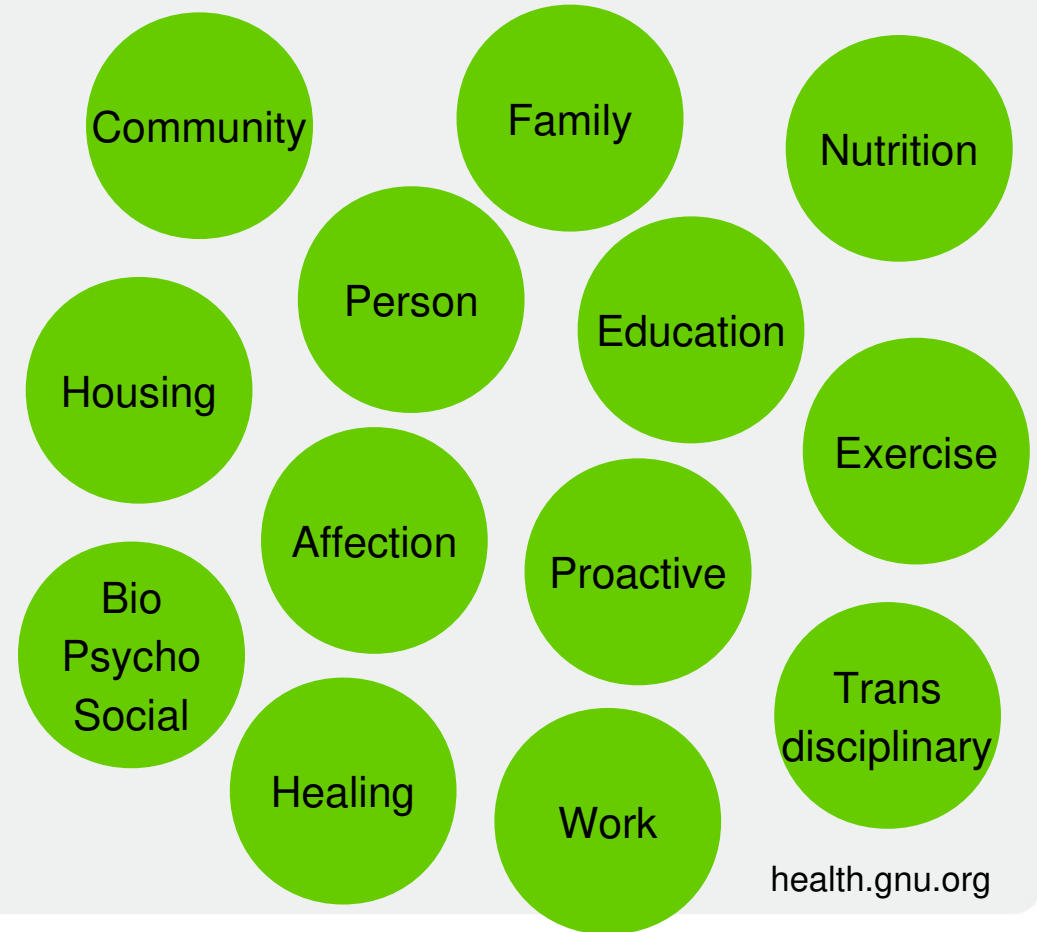
The Domiciliary Units (DUs)

Address / Location

Construction material

Number of rooms

Sanitary conditions

Bathrooms

Sewers

Electricity

...

The DU shows the people currently living in it at any given moment

The DU can be geolocated / linked to OpenStreetMap

Health Institutions and Operational Sectors

People Before Patients : Demographics

Families

Example of a "nuclear family" . They may or may not share the same Domiciliary Unit

Empowering the person, family and community

Name : Betz, Ana

DoB : 1985-10-04

Blood Type : A +

55567890

Female Universal Person Identifier

Socioeconomics
Education
Lifestyle
Physical exercise
Nutrition
Working conditions
...

Family Members and their roles
Family Affection / Functionality Level
Domiciliary Units conformants
Contacts info : Key for quickly locating them in outbreaks
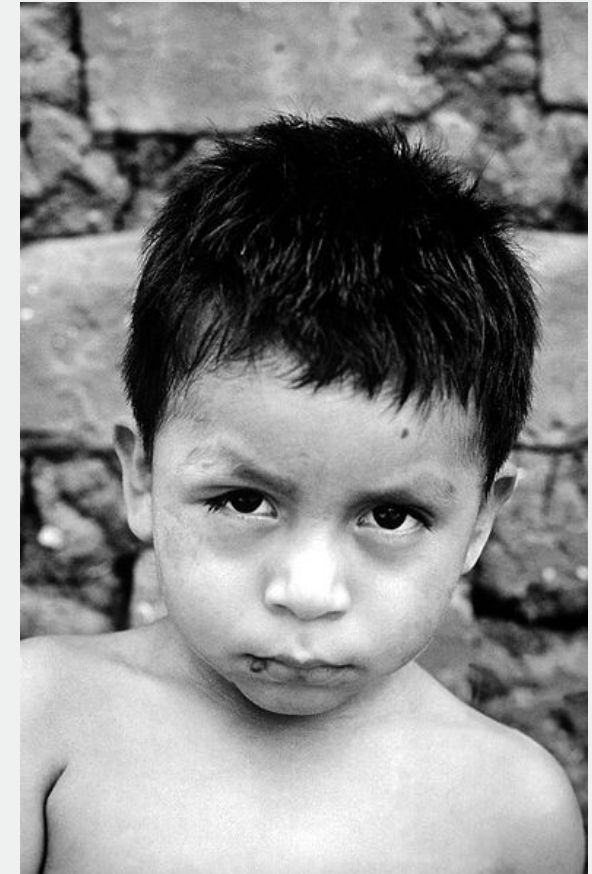...

GNU Health promotes transdisciplinary work, and makes the person an active member of the system of health

GNU Health WHO modules to fight against social diseases

MDG 6 : Fight HIV, Malaria & Tuberculosis

NTD: Fight Neglected Tropical Diseases(Chagas, Dengue...)

Domiciliary Units Survey example : Chagas

health.gnu.org

Medical Practice and
Health Center Management

GNU Health : Modularity and Interoperability

GNU Health Modular Design

Epidemiology	Laboratory	Socioeconomics
Genetics	GNU Health (core module)	
Family	Localizations (Brazil, Germany, India...)	Hospital

Pediatrics
Surgery
Radiology
Hemato
Oncology

Centralized Patient Information

Obstetrics & Pediatrics

Preconception and Prenatal Care

Genetic Risks and counseling

Obstetric evaluations / imaging

Nutrition and growth charts

Socioeconomics

Neonatology

Immunizations

Family Functionality and Affection level

Psychosocial Risk (Mass General Hospital PSC)

Disease Groups

Tuberculosis example

Automatic triggers

Patient Critical Info

Reporting

Some Social and Lifestyle screening tools

CAGE Alcoholism screening

Smilkstein Family functionality test

Henningfield recreational drug classification

Pediatric Psychosocial risk (PSC from MGH)

NIDA recreational drugs Database

Quick retrieval of Person and Patient Info

Name : Betz, Ana

DoB : 1985-10-04

Blood Type : A +

55567890

Female

Critical Info : T1D

Demographics

PUID

Contact Information

Critical Information
(allergies, diseases)

....

Person ID Card
QR Codes
Wearables

Digital Signatures & ePrescriptions

Digitally sign documents and medical acts

GNU Privacy Guard (GNUPG) Integration

Authenticity, accountability & non-repudiation

Document validation
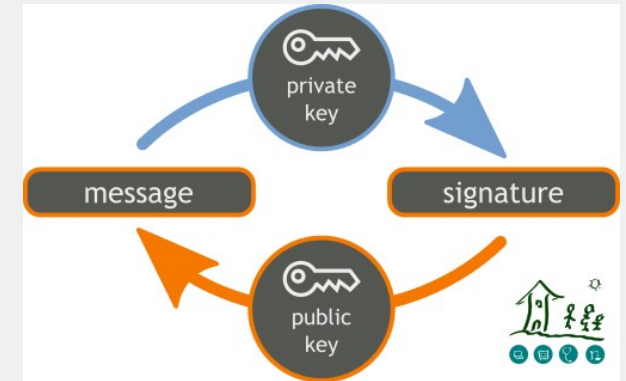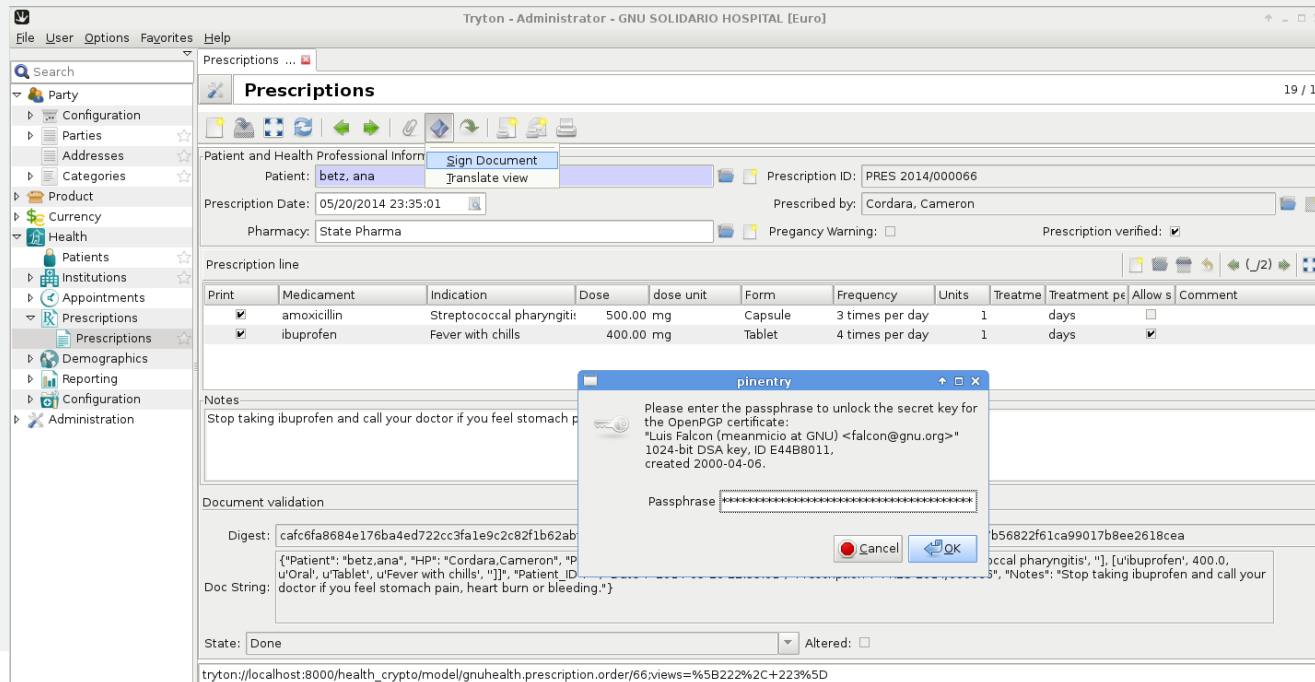
ePrescriptions

Evaluations / Encounters

Birth and death certificates

Lab Tests, ...

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Tools for the
Health Authorities

Exchanging information

HL7 FHIR

One person, one history : PUID

63dd59be-141c-4ff9-a0a9-e43a6f754b39-GNU SOLIDARIO HOSPITAL

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Reporting, Epidemiology, Early Warning

Data aggregation / Synchro

Demographics

People without health coverage

Vital Records Sytem

Outbrake early warning

Geolocalization (OSM)

Notifiable diseases

Injury Surveillance System

GNU Health Injury Surveillance System integration with Open Street Map

http://health.gnu.org

Records violent injuries (accidents, robberies, self harm, sexual assaults,...)

Georeferenced

ICD 10 encoded

Contextual information (place, time, subjects involved, …)

Thanks to Jamaica MoH !

Health Campaigns

Personalized campaigns (age, sex, social conditions, …)

Immunization status of the population

Risk groups (obesity, diabetes, …)
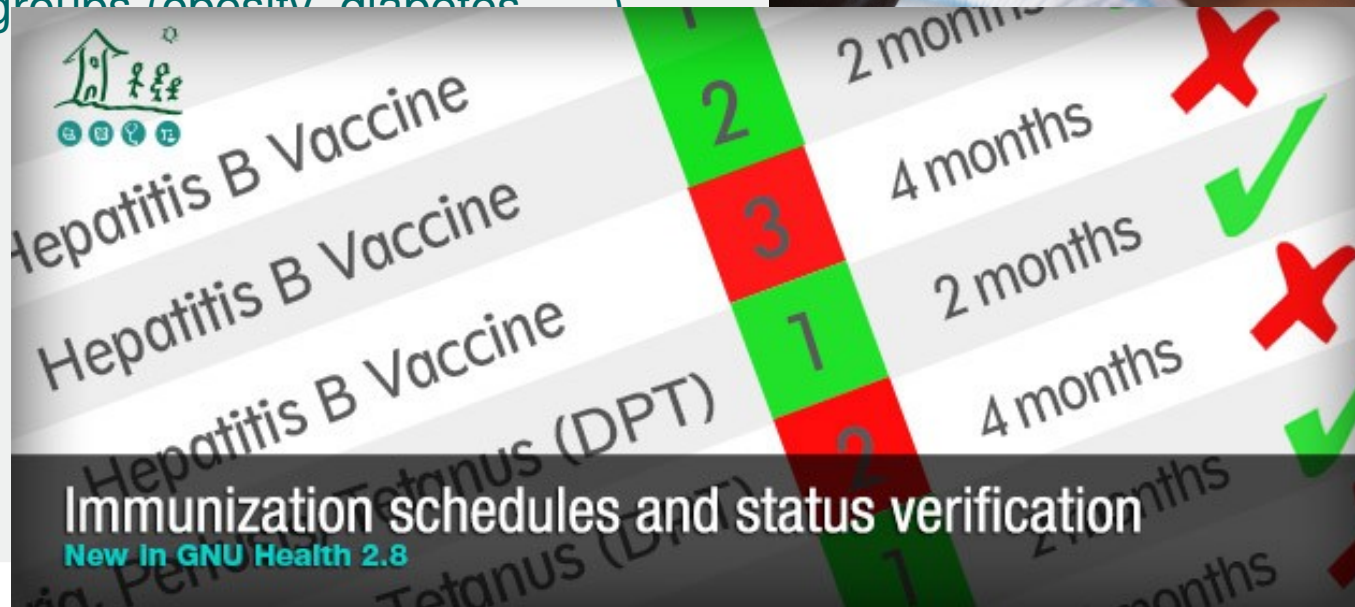
Hepatitis B Vaccine

Hepatitis B Vaccine

Hepatitis B Vaccine

Tetanus (DPT)

Tetanus (DPT)

2 months

4 months

2 months

4 months

Immunization schedules and status verification
New in GNU Health 2.8

VRS : Birth and Death Certificates

Death certificate document as a legal, administrative, epidemidemiological document

What is new in
upcoming 3.0 ?

Tryton 3.8 Compatibility

health.gnu.org

Current Tryton modules	
account	stock_lot
account_invoice	purchase
account_product	account_invoice_stock
calendar	stock_supply
company	
country	
party	
product stock	

Faster and more efficient medical practice

Networks of health institutions (countries)

Data aggregation

Synchronization (Thanks B2CK :–))

GNU Health Citizen and Patient Portal (3.0)

GNU Health Central Instance

GNU Health
Citizen & Patient Portal

Demographics
Appointments
Lab tests

Social Services
Domicilary surveys
Domestic Violence
Drug problems
PSC
...

GNU Health FHIR server

HL7 support - FHIR

Incorporate HL7 FHIR HumanName

1.19.0.12 HumanName 🌎

See also Examples, Detailed Descriptions and Mappings.

A name of a human with text, parts and usage information.

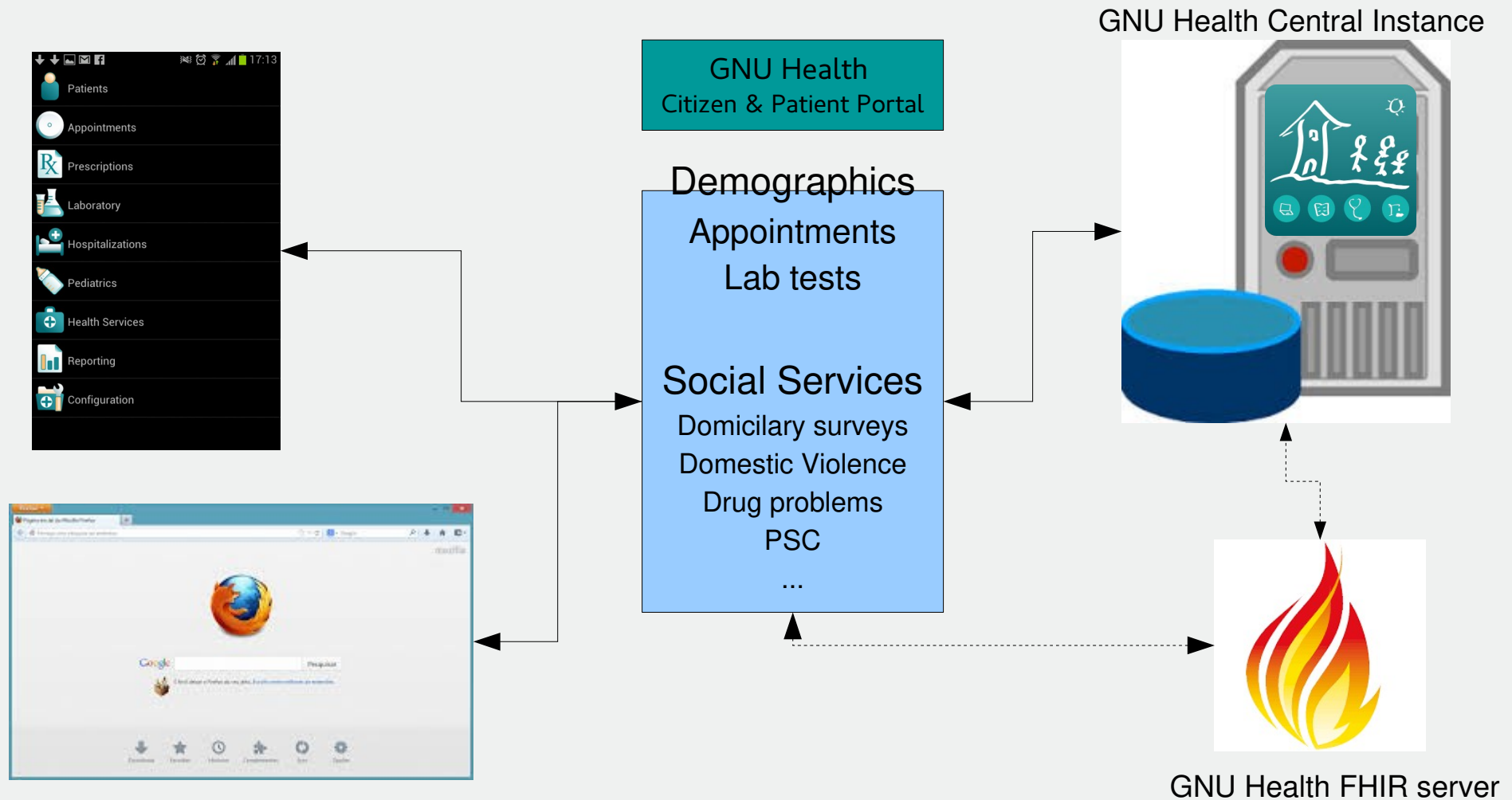Names may be changed or repudiated. People may have different names in different contexts. Names may be divided into parts of different type that have variable significance depending on context, though the division into parts is not always significant. With personal names, the different parts may or may not be imbued with some implicit meaning; various cultures associate different importance with the name parts and the degree to which systems SHALL care about name parts around the world varies widely.

Structure | UML | XML | JSON | All

Structure

Name	Flags	Card.	Type	Description & Constraints ?
📁 HumanName	Σ		Element	Name of a human - parts and usage
📄 use	?! Σ	0..1	code	usual | official | temp | nickname | anonymous | old | maiden NameUse (Required)
📄 text	Σ	0..1	string	Text representation of the full name
📄 family	Σ	0..*	string	Family name (often called 'Surname')
📄 given	Σ	0..*	string	Given names (not always 'first'). Includes middle names
📄 prefix	Σ	0..*	string	Parts that come before the name
📄 suffix	Σ	0..*	string	Parts that come after the name
📦 period	Σ	0..1	Period	Time period when name was/is in use

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Functioning and Disability Module
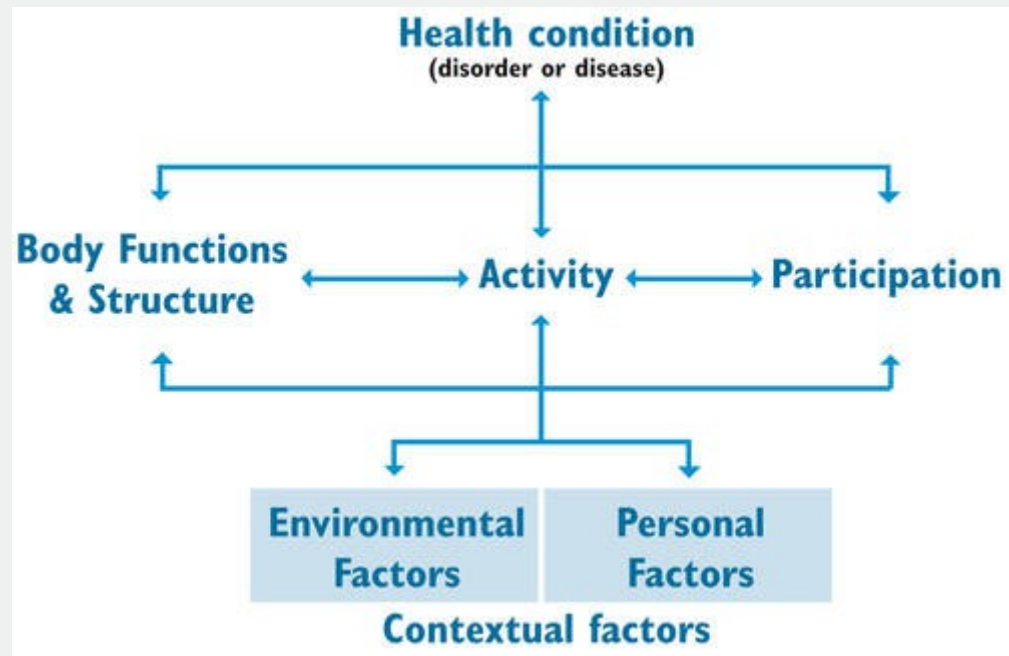
Ophthalmology Module
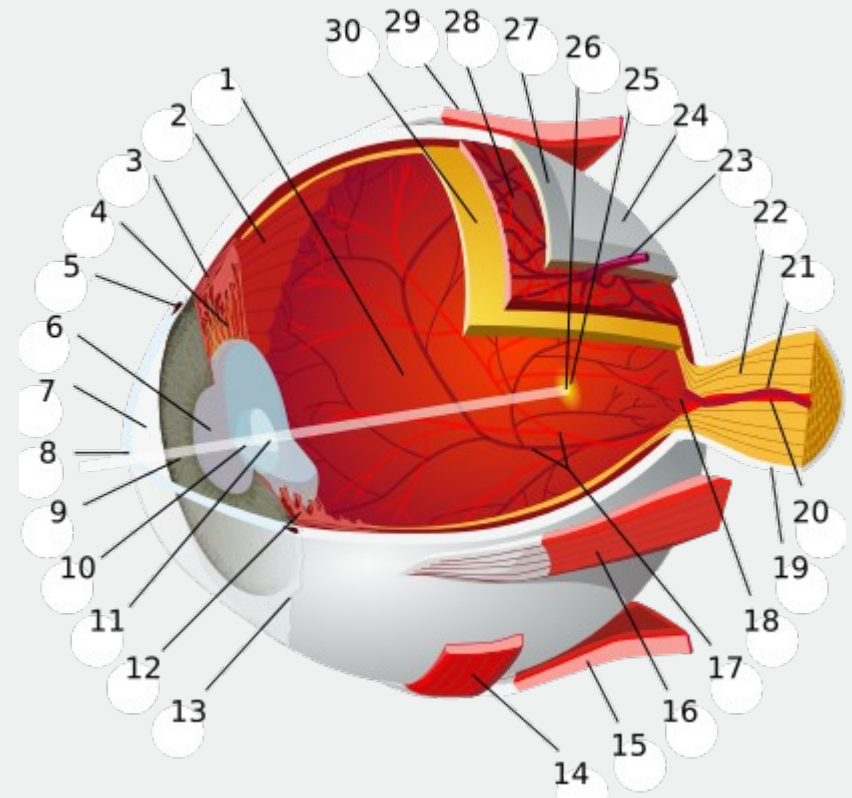
Enhanced Health Services integration

Service templates

Automatic addition from different
health sectors to service model

Patient Evaluation integration

Incorporate visual aids in tree views

Optimize daily practice

Optimize encoding and management of appointments and evaluations

Auto-fill default prescription details from the medicament

Allow including the medication on the list of the patient relevant meds

New procedures (ICD-9 v3)

Current Procedures codes : ICPM, ICD10-PCS, ICD9 v3

Free Hardware
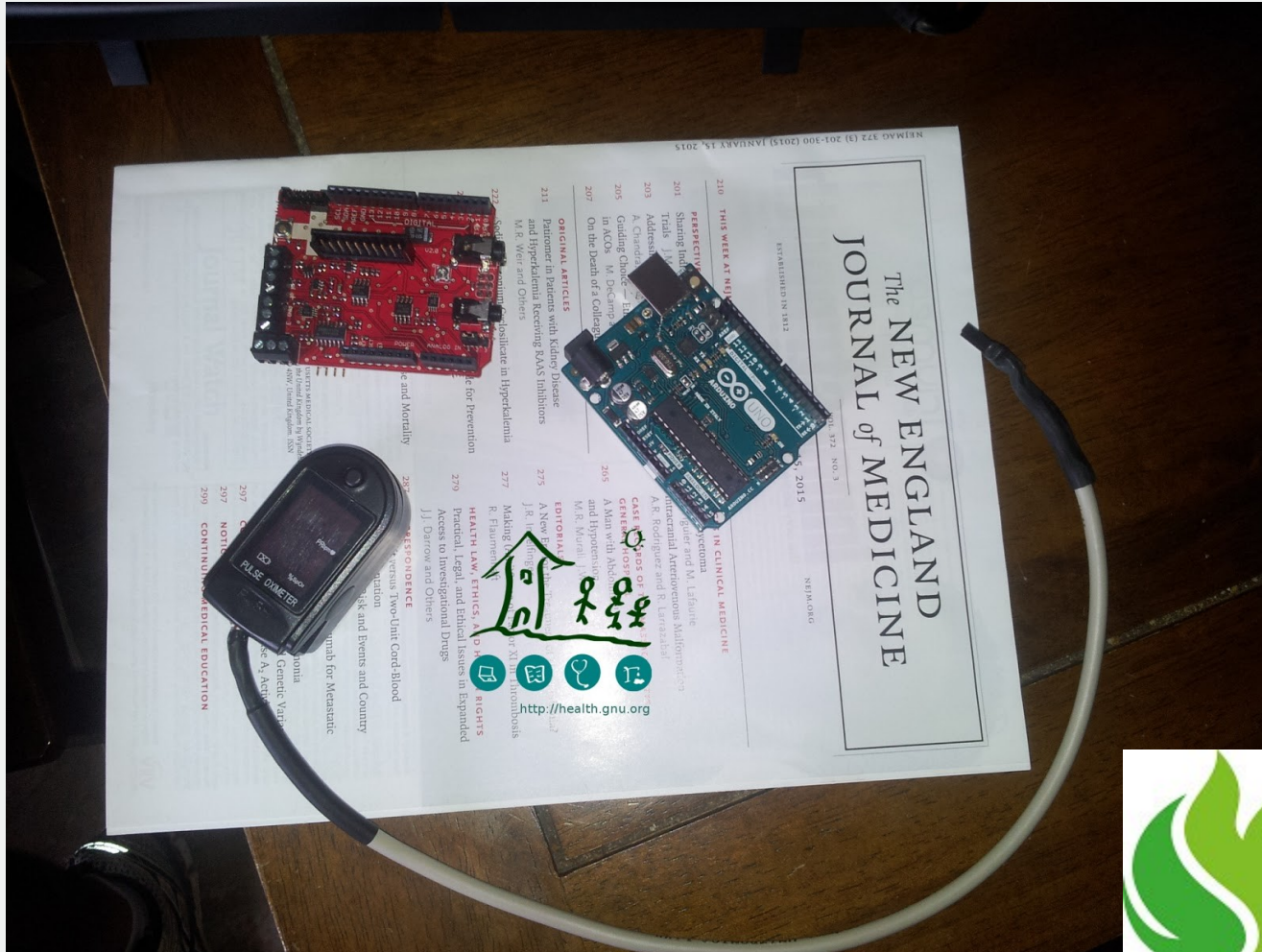
Arduino integration

Summary of Improvements on current modules

Surgery : Surgery teams, Operating Room reservation and management, surgery progress, length,

Core : Move ECG to core from ICU; include demographics on patient evaluation view; appointment, prescription and evaluation improvements

Hospitalization / Inpatient : Meal order management, special needs, bed cleaning

Additionals models in Health Crypto

Digitally sign documents and medical acts

GNU Privacy Guard (GNUPG) Integration

Authenticity, accountability & non-repudiation

Document validation
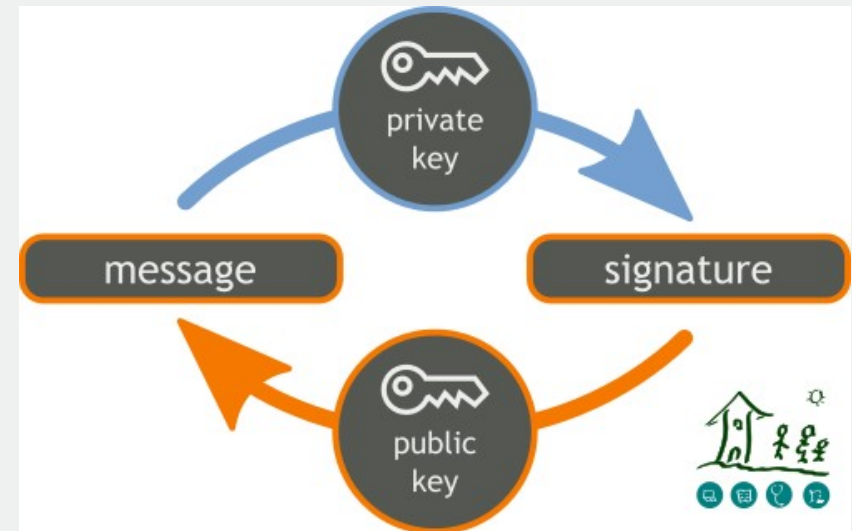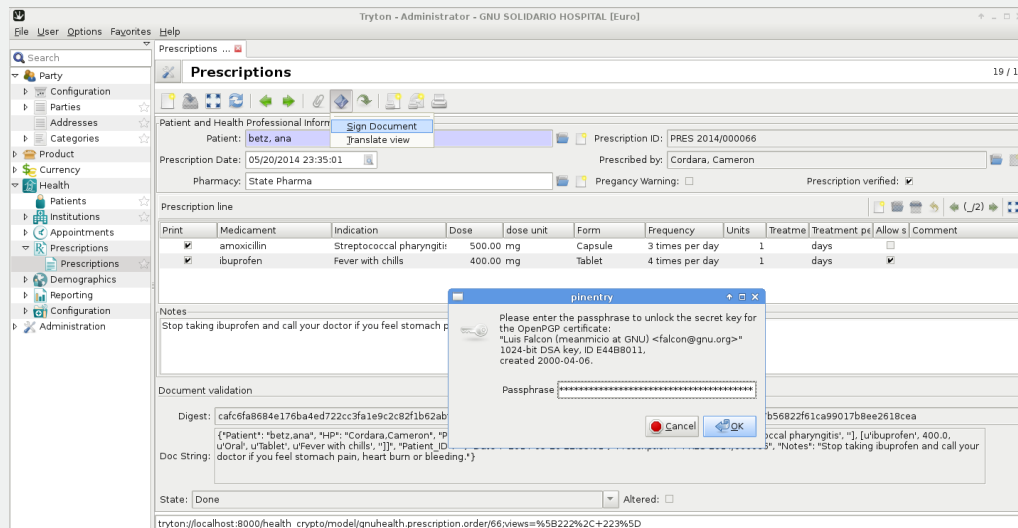
Prescriptions

Evaluations

Birth and death certificates

...

./gnuhealth-update

Update manager

Critical Patches

Large installations

Can be run non-interactively

```
usage: gnuhealth-update command [options]

Command:

  version : Show version
  backup : Backup he gnuhealth kernel, attach dir and database
  install : Download and install the patches

Options:

  --nobackup : Don't do a backup previous to the update.
  --backupdest : destination of the backup file
  --dry-run : Check, download and preview, but don't actually update process
  --database : database name to use with the install or backup command

lfm@beastie:~/health/tryton $
```

./serverpass

```
usage: serverpass.py [-h] [-c CONFIG]

optional arguments:
  -h, --help            show this help message and exit
  -c CONFIG, --config CONFIG
                        Specify alternative Tryton configuration file
```

Harden security at installation level (cracklib)

Integrated in the installation script gnuhealth-install.sh

Can be used as a stand-alone process

Pootle as the Translation Platform

1-Year Release Cycle

Community

Role of the Academia

United Nations University, Kuala Lumpur,Malasia

University of Entre Rios, Argentina

HST.936: Global Health Informatics to Improve Quality of Care

The 2015 iteration of our course will focus on **Public Health Emergencies and Humanitarian Crises**.

Classes begin: February 6, 2015
Fridays 9am – 11am ET (GMT -5)
Room: **09-057**
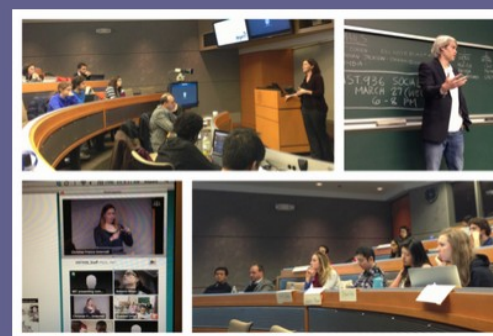
Harvard-MIT, Boston, United States

GNU Health & WHO

GNU Health presentation at WHO and ITU
ICT for Improving Information and Accountability for Women's and Children's Health

MDG6 : Malaria, TB, HIV

Essential list of medicines

Neglected Tropical Diseases

ICD-10   ICPM

MDG4 : Reduce Child mortality

Immunization schedules

Pediatric growth charts

GNU Health at WHO Global Forum on Medical Devices
GNU Health: Interfacing and Interoperability. 22-24 November 2013, Geneva, Switzerland

GNU Health at the Government of Jamaica

GNU Health Goes to Jamaica !

¡Fotos de Luis Falcon

http://health.gnu.org

Started as a joint project between Government of Jamaica Ministry of Health and GNU Solidario

Local team

Sustainability and independence

Unique ID for each individual across the country

Data aggregation at MoH

GNU/Linux on both workstations and servers

Login

GNU Health

Profile: ▼ ✎ Manage profiles

▽ Host / Database information

Host: localhost:8000

Database: health-jamaica

User name: admin

Password: ●●●●●●●●

● Cancel   💻 Connect
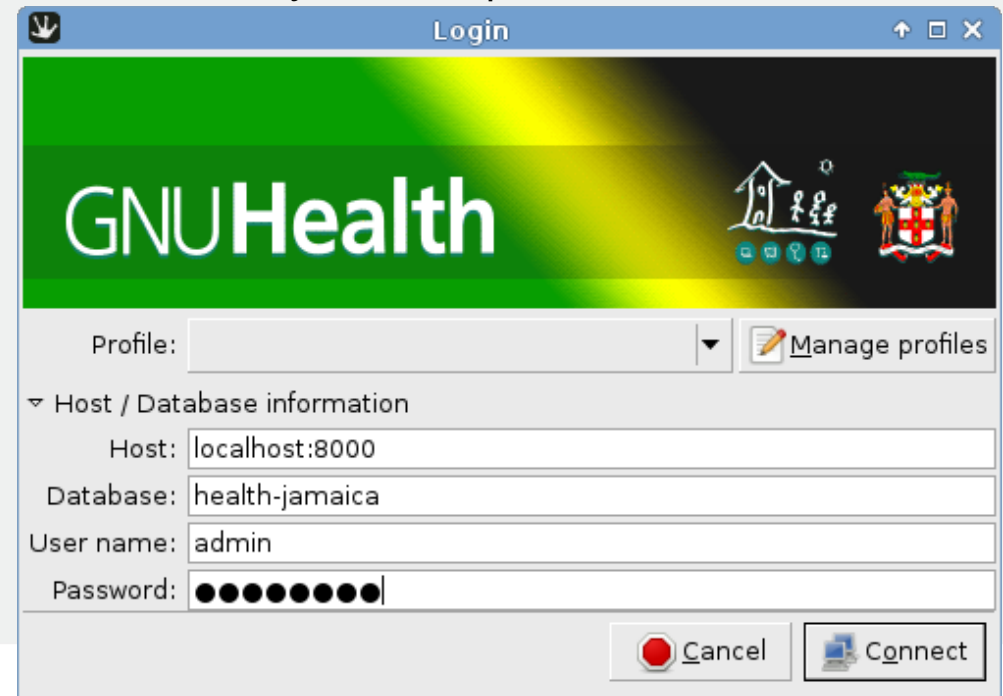
GNU Health Synchro engine, ICPM and ISS modules were born in Jamaica !

350+ "GNU" Health facilities nation-wide

GNU Health at Laos Public Health System

Philippines – Navotas City

South Africa : Visit to Nelson Mandela Children Hospital

GNU Health in Mexico Morelos Public Health

Thank you !

http://health.gnu.org

IRC : #gnu-health

Twitter : @gnuhealth