

GNU Health

Free Software technology improving Public Healthcare around the world



Celebrating 10 years of Freedom and Equity in Healthcare

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Luis Falcón Martín
Gnu Solidario .
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GNU Health : Freedom and Equity in Health

GNU Health is a Social Project

...that uses really cool technology



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)

GNUHealthCon - IWEEE

International Workshop on E-Health in Emerging Economies.



Over 20000 Children die every day from Social Diseases – in misery



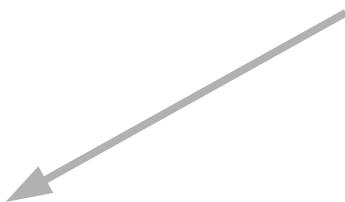
Human Trafficking
Contaminated Water
Malnutrition
Cholera
Drug abuse
Prostitution
Chagas
Tuberculosis
Child Labour
War
Family Violence
Malaria
HIV / AIDS



The other Miserables: Those who cause misery



The macabre business of war

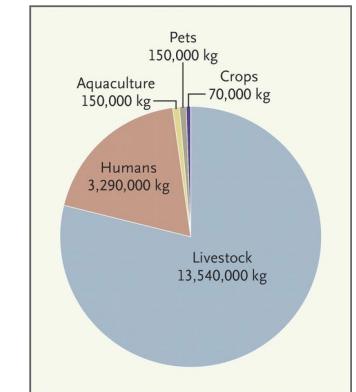


Dairy and Meat : Inhumane, Cruel and Unhealthy



- * Extremely cruel
- * Stress → immunocompromise → ATB → Resistance
- * Bacteria contamination
- * Milk / meat full with ATB, Hormones, ...
- * Linked to cancer, cardiovascular disease in humans
- * Global warming

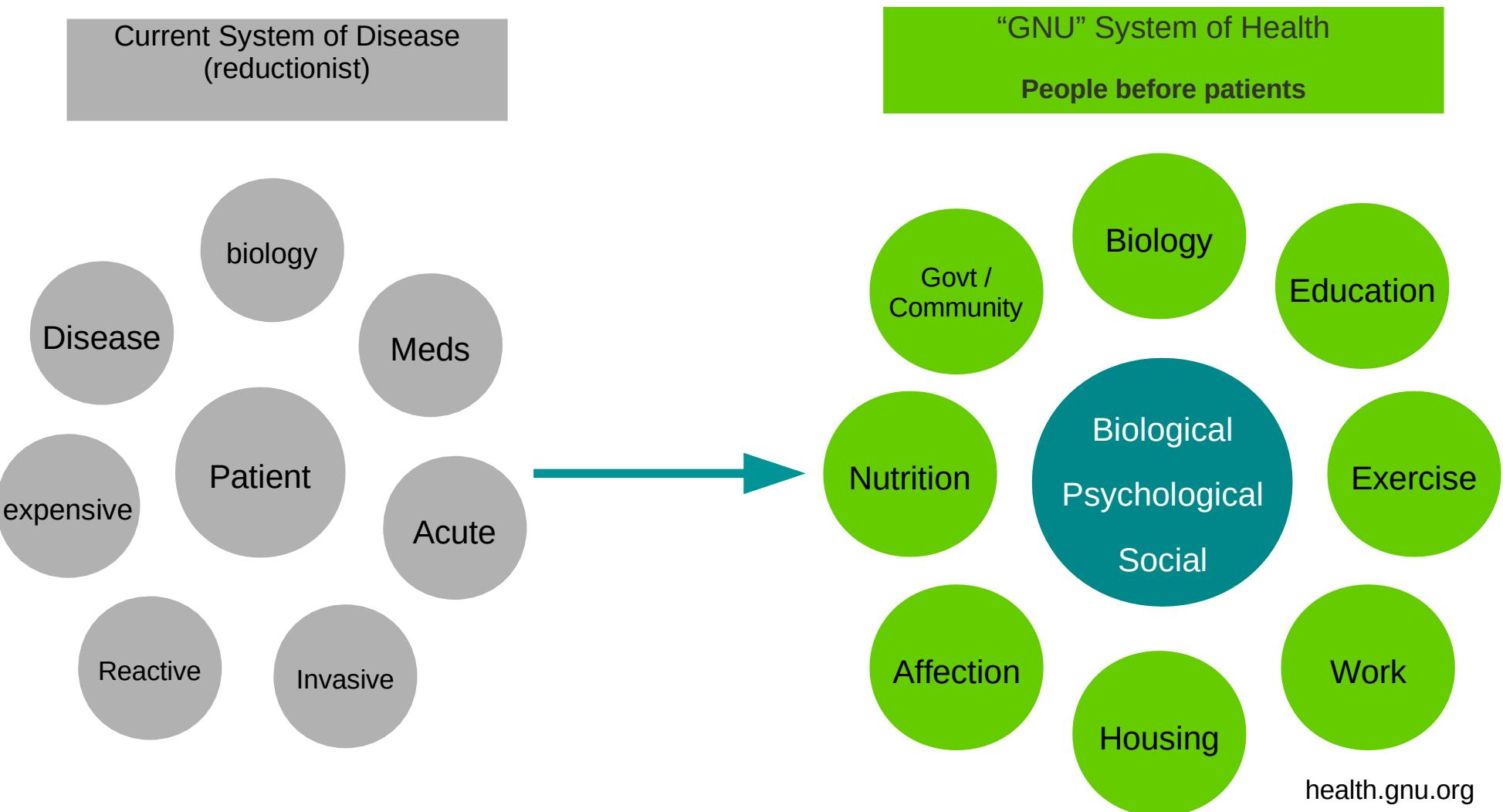
Factory farming accounts for 37% of methane emissions, 20 times the global warming potential of CO₂



New England Journal of Medicine
Dec 26, 2013



GNU Health : Nature and Nurture



GNU Health : Functionality



Person and Community

- Person, families
- Domiciliary Units,
- Health Institutions, professionals
- Socioeconomics, lifestyle .

Patient

- Medical history, Evaluations, ap ointments
- Genetics & family history
- Prescriptions
- surgeries...

Health Institution Management

- Finances, Billing
- Stock Management , pharmacies
- Hospitalizations, Inpatientcomplex
- LIMS
- Emergency Management .

Health Authorities/ MoH

- * Civil / Vital Record System
- Health campaigns
- Epidemiology
- Federation, distributed health networks .



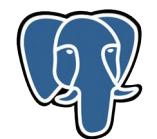
GNU Health is Free / Libre Software

Official GNU Package, from the Free Software Foundation

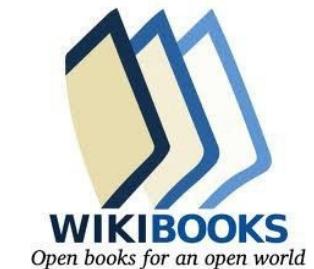
Open Documentation

Relies on free technology

International community (100+ language teams)



PostgreSQL



python



health.gnu.org

Demographics Community and Infrastructure



The Domiciliary Units (DUs)

Address / Location
Construction material
Number of rooms

Sanitary conditions

Bathrooms
Sewers
Electricity
...

Screenshot of a software interface for managing Domiciliary Units (DUs). The interface includes fields for basic information like address, infrastructure details, and members, along with a map and an image of a house.

Basic Information:

Code: Valse-LeonyCastillo1	Desc: House by the city town hall.	
Street: Leon y Castillo	Number: 1	Apartment:
District:	Municipality: Valsequillo	City:
Zip Code: 35217	Country: Spain	Province: Las Palmas

Latitude: 27.991891000000004 Longitude: -15.494628000000004

OSM Map: <http://openstreetmap.org/?lat=27.991891000000004&lon=-15.494628000000004>

Infrastructure:

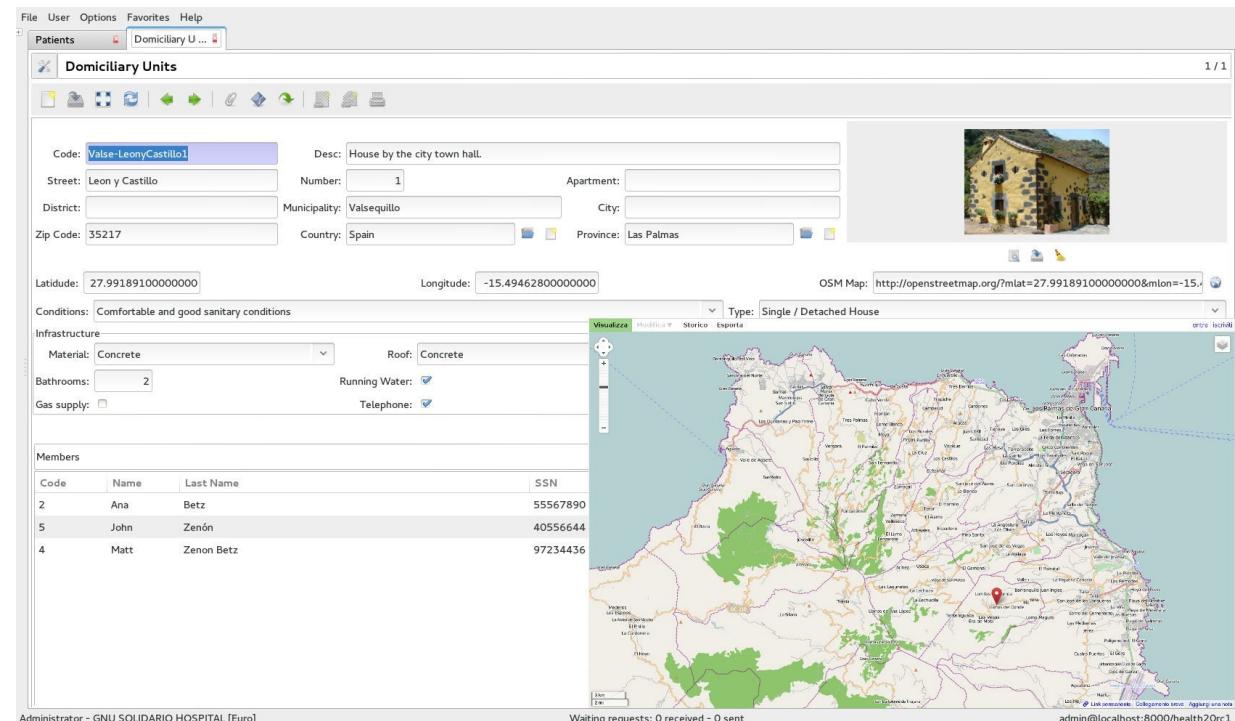
Material: Concrete	Roof: Concrete
Bathrooms: 2	Running Water: <input checked="" type="checkbox"/>
Gas supply: <input type="checkbox"/>	Telephone: <input checked="" type="checkbox"/>

Members:

Code	Name	Last Name	SSN
2	Ana	Betz	55567890
5	John	Zenón	40556644
4	Matt	Zenon Betz	97234436

Administrator - GNU SOLIDARIO HOSPITAL [Euro] Waiting requests: 0 received - 0 sent

admin@localhost:8000/health20rc1



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

Screenshot of the Tryton application interface showing the 'Institutions' module for 'GNU SOLIDARIO HOSPITAL [Euro]'. The window title is 'Tryton - Administrator - GNU SOLIDARIO HOSPITAL [Euro]'. The left sidebar shows a tree view of the application menu, including 'File', 'User', 'Options', 'Favorites', 'Help', 'Search', 'Party', 'Product', 'Financial', 'Currency', 'Inventory & Stock', 'Calendar', 'Health' (selected), 'Patients', 'Institutions' (selected), 'Appointments', 'Prescriptions', 'Demographics', 'Laboratory', 'Imaging', 'Hospitalizations', 'Surgeries', 'Pediatrics', 'Archives', 'Nursing', 'Health Services', 'Reporting', 'Configuration', and 'Administration'. The main content area displays the 'Institutions' screen with the following details:

- Institution: GNU SOLIDARIO HOSPITAL
- Type: General Hospital
- Public Level: Public
- Heliport:
- Trauma Center:
- Beds: 750
- ORs: 15
- Code: SPAIN-LASPALMAS-GNUSOLIDARIO-GRAL_H
- Specialty: (empty)
- Teaching:
- Trauma Level: Level I
- Operating Room:
- Institution Picture: A photograph of a modern hospital building with red and white panels.
- Specialties: Specialty, Nutrition, Cardiovascular
- Operational Sector: Operational Sector, Las Palmas de Gran Canaria

The bottom of the screen contains a note about the hospital and its operational sectors, followed by the URL: tryton://localhost:8000/health26/model/gnuhealth.institution/1;views=%5B603%2C+604%5D



People Before Patients : Demographics

Name: Ana Last Name: Betz PUID: 55567890

Active:

Health General Accounting Stock

Person: Patient: Health Prof: Institution: Insurance Company: Pharmacy:

Demographics

DoB: 10/04/1985 <input type="button" value="..."/>	Sex: Female <input type="button" value="..."/>
Occupation: Teacher <input type="button" value="..."/>	Education Level: University <input type="button" value="..."/>
Mother: Luna <input type="button" value="..."/>	Father: Caput, Bonifacio <input type="button" value="..."/>
Marital Status: Married <input type="button" value="..."/>	Citizenship: Spain <input type="button" value="..."/>
Country of Residence: Spain <input type="button" value="..."/>	Domiciliary Unit: Valse-LeonyCastillo1 <input type="button" value="..."/>
Ethnic group: Hispanic <input type="button" value="..."/>	Alternative IDs: <input checked="" type="checkbox"/>

Picture



Alternative IDs

Code	ID type	Comments
93674665J	Passport	Spanish Passport
PAC001	Medical Record	



health.gnu.org

Medical Practice and Health Center Management



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Modularity

GNU Health Modular Design



Some of current packages

Package	Functionality
Health	Core package. Includes demographics, patients, evaluations, health centers, appointments, vaccinations, medicaments, health conditions, health professionals and other core models and functionality.
Pediatrics	Main package for pediatrics (including neonatal information and pediatric psychosocial assessments)
Pediatric Growth Charts	Including World Health Organization percentile and z-scores charts
Gynecology and Obstetrics	Gynecology, obstetrics, perinatal and puerperium assessment and history
Lifestyle	Physical exercise, diets, drug addictions, National Institute of Drug Abuse (NIDA) recreational drug database , Henningfield ratings, sexuality, risk factors, home safety, child safety
Genetics	Person genetic information and family history. Includes 4200+ "disease genes" from the NCBI / GeneCards
Genetics Uniprot	UniProt database on human protein natural variants and phenotypes
Lab	Laboratory Information Management System functionality. ^[1]
Socioeconomics	Assessment and history of education, occupation, living conditions, hostile areas, child labor and prostitution, among others.
Inpatient	Hospitalization, bed, operating room management. Inpatient care and nursing plans.
Surgery	Pre-operation checklist, procedures, operating rooms, patient surgery history.
Services	Groups health related services for the patient. It also allows generating invoices and billing the selected services.
Calendar	CalDAV and WebDAV server. Manages appointments, hospitalizations, bed and other resources.
QR Codes	Includes QR codes for identification on persons, patients and lab orders
History	Reports for patient demographics and medical history
MDG6	Millennium Development Goal 6. Functionality to fight Malaria, Tuberculosis and HIV/AIDS.
Reporting	Demographical, epidemiological and health center related information.
Nursing	Nursing functionality. Patient roundings, medication administration and procedures.
ICU	Basic intensive-care unit assessment, history and patient management
Stock	Pharmacy and locations stock management. Automatic stock moves generation on medical procedures.
NTD	Base module to cover Neglected tropical diseases .
NTD Chagas	NTD submodule for vector control, diagnosis, and management of Chagas disease .
NTD Dengue	NTD submodule for vector control, diagnosis, and management of Dengue fever
Imaging	Diagnostic Imaging orders management functionality.
ICPM	WHO International Classification of Procedures in Medicine
Crypto	Support for document digest / record integrity check with hash functions ; digital signatures and GNU Privacy Guard plugin .
Archives	Functionality to track legacy or paper-based patient Health records.
Ophthalmology	Basic Ophthalmology and Optometry functionality
Functioning and Disability	Based on WHO International Classification of Functioning, Disability and Health and Laos Center of Medical Rehabilitation
ICD9 Vol 3	WHO ICD-9-CM Volume 3 Procedure codes
Insurance	Insurance and pricelists on services and products management
EMS	Ambulance and Emergency Management System



Patient Management

GNU Health - localhost - Administrator - GNU SOLIDARIO HOSPITAL [Ksh]

Connection User Options Favorites Window Help

Obstetric Histories Patient

Patient

Main Info

Ana Betz

Critical Information

Z88.0 : Personal history of allergy to penicillin
Z88.0 : Personal history of allergy to penicillin
E10 : Type 1 diabetes mellitus
A90 : Dengue fever [classical dengue]
A40 : Streptococcal sepsis

Disabilities / Barriers:

Appointments

Conditions

Disability Assessment

ECGs

Evaluations

Imaging Test Request

Imaging Test Results

Lab: Reports

Lab: Request new order

Neonatal Info

Obstetric History

Ophthalmologic Evaluations

PSC

Prescriptions

RCR

Request Imaging Test

Services

Socioeconomic and Family Assessment

Surgeries

Vaccinations

Age: 37y 8m 27d

Photo of Ana Betz

Marital Status: Married

Insurance: Insurator: 938291

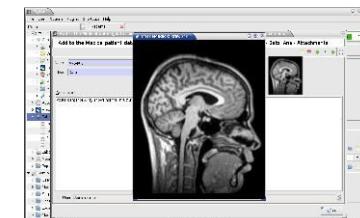
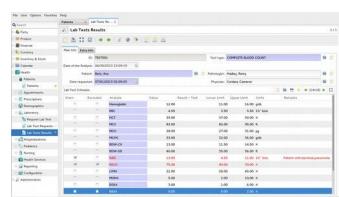
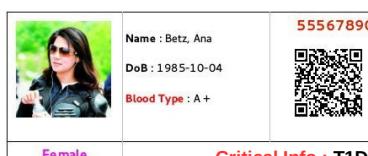
DoB: 08/28/1980 PUID: 55567890 Blood Type: A Hospitalized: Hb: Active:

PAT ANA Connected

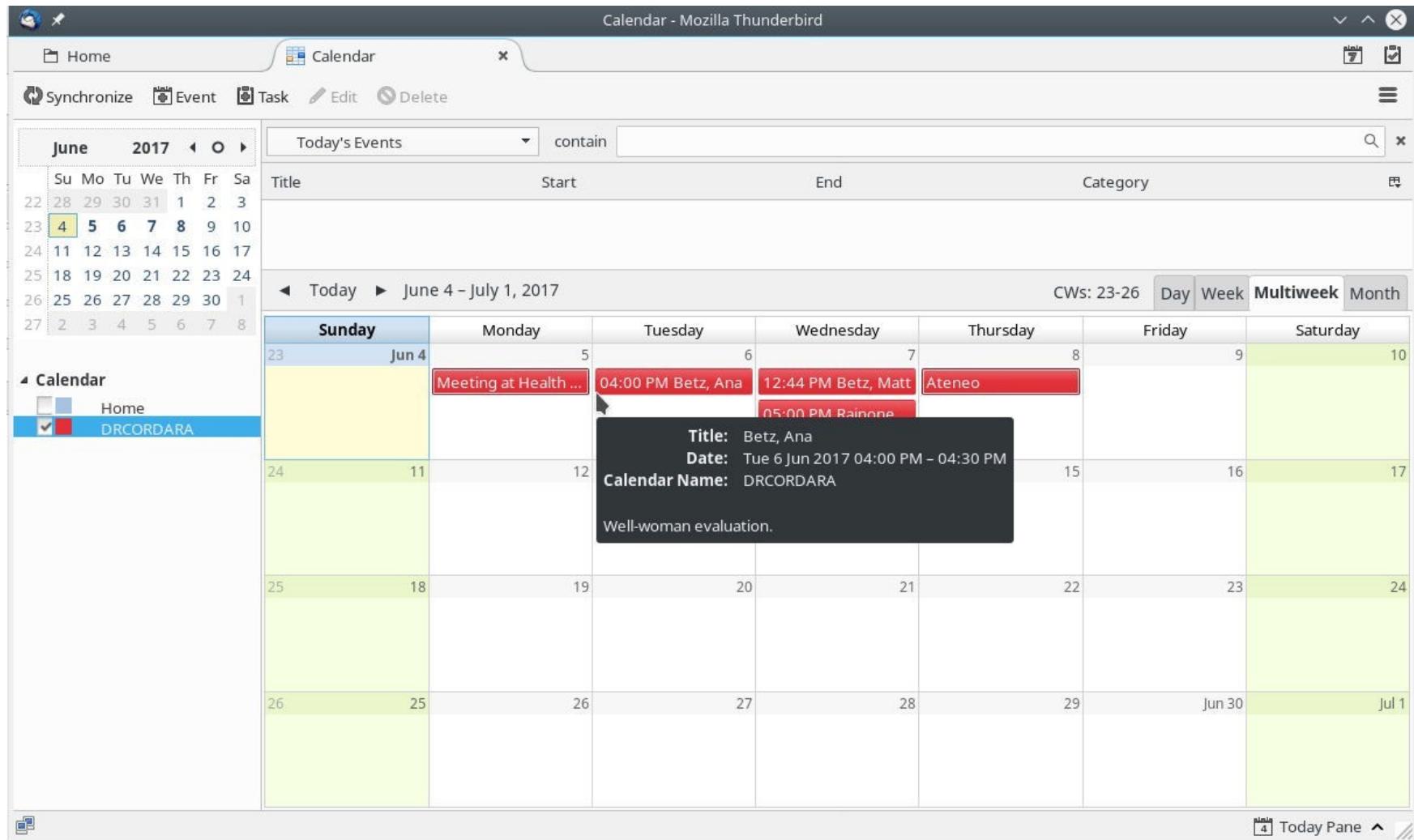
Obstetrics Histories

Search Party Product Financial Currency Inventory & Stock Purchase Calendar Patients Appointments Prescriptions Laboratory Health Professionals Institutions Imaging Demographics Hospitalizations Surgeries Pediatrics

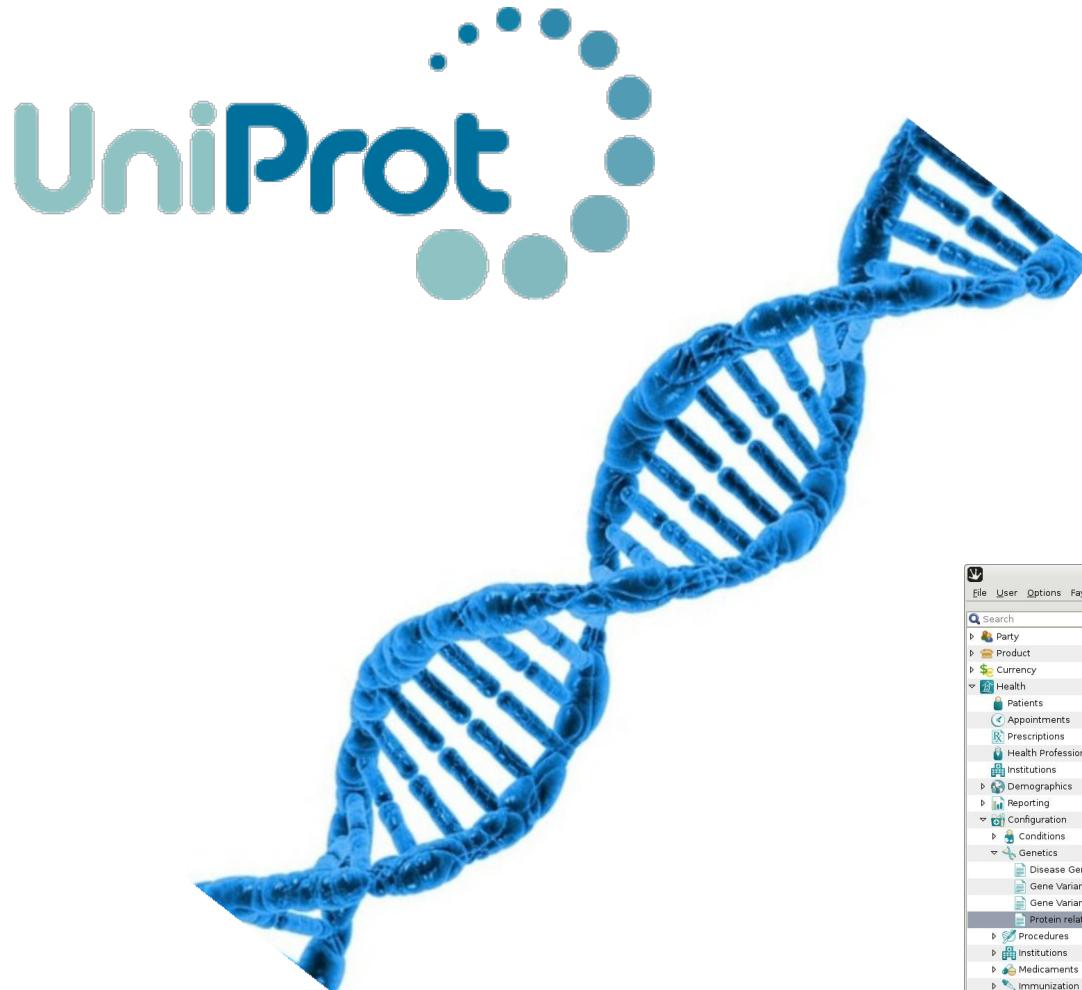
Archives Nursing Support Center Ambulances Federation Health Services Reporting Configuration Administration



Calendar functionality



Bioinformatics and Precision Medicine



Linking clinicians with research

Personal genetic information & family history Work with Uniprot

Protein related diseases

Gene Natural Variants & phenotypes

GNU Health Federation to interact with scientific community

The screenshot shows a computer window titled "Triton - Administrator - GNU SOLIDARIO HTAL [Euro]". The menu bar includes File, User, Options, Favorites, and Help. The main window has a toolbar with various icons. On the left is a sidebar with categories like Party, Product, Currency, Health (Patients, Appointments, Prescriptions, Health Professionals, Institutions, Demographics, Reporting, Configuration, Conditions, Genetics, Disease Genes, Gene Variants, Gene Variant Phenotypes, Protein related diseases), Procedures, Institutions, Medicaments, Immunization Schedule, and Administration. The central area displays "Protein related diseases" for "Amyloidosis B" (Acronym: AMYLB). It shows details such as Disease: DI-00104, Disease name: Amyloidosis B, Acronym: AMYLB, and Disease URI: . Below this is a "Gene Variants" table:

Gene	Variant
APOA1:apolipoprotein A-I	APOA1:apolipoprotein A-I : VAR_000609 : p.Gly50Arg
APOA1:apolipoprotein A-I	APOA1:apolipoprotein A-I : VAR_000610 : p.Leu8Arg
FGA:fibrinogen alpha chain	FGA:fibrinogen alpha chain : VAR_010731 : p.Glu545Val
FGA:fibrinogen alpha chain	FGA:fibrinogen alpha chain : VAR_010732 : p.Arg573Leu
LYZ:lysosome (renal amyloidosis)	LYZ:lysosome (renal amyloidosis) : VAR_004280 : p.Ile74Thr
LYZ:lysosome (renal amyloidosis)	LYZ:lysosome (renal amyloidosis) : VAR_004281 : p.Asp85Ile

At the bottom, a note says "Gene variants involved in this condition" and the URL "tryton://localhost:8000/genetics/model/gnuhealth.protein.disease/99;context=%7B%22date_format%22%3A+%22%25m%2F%25d%2F%25Y%27D&views=%5B%270%2C+271%5D".



GNU LIMS



Laboratory Information System for HealthCare and
Biomedicine



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GNU LIMS: Interoperability and Interfaces

The image displays a multi-layered view of the GNU LIMS system. On the left, a photograph shows a rack of blood test tubes and a medical device screen with results. Overlaid on the right is a screenshot of the software's graphical user interface. The interface includes a top menu bar (File, User, Options, Favorites, Help), a search bar, and a sidebar navigation tree. The main area is titled 'Lab Tests Results' and contains tabs for 'Main Info', 'Extra Info', and 'Validation'. It shows a list of lab tests with columns for ID, Test type, Patient, Date requested, Request, and detailed results. A specific row for 'WBC' is highlighted. At the bottom, there are sections for 'State' (Draft) and 'Done' status indicators. A terminal window at the bottom left shows command-line logs related to the software's health server.

tryton Administrator - GNU SOLIDARIO HOSPITAL (Euro)

File User Options Favorites Help

Search

Party Product Financial Currency Inventory & Stock Purchase Calendar

Health Patients Appointments Prescriptions Laboratory

Lab Requests new order Lab Test Requests Lab Test Results

Health Professionals Institutions Imaging Demographics Hospitalizations Surgeries Pediatrics Archives Nursing Health Services Reporting Configuration Conditions Genetics Disease Genes Gene Variants Gene Variant Phenotypes Protein related diseases

Imaging Procedures Laboratory Institutions Medicaments Immunization Schedule Mix

Main Info Extra Info Validation

ID: TEST006 Test type: COMPLETE BLOOD COUNT

Date of the Analysis: 10/23/2016 17:22:07 Patient: Betz, Ana Physician:

Date requested: 10/23/2016 17:21:27 Physician: Cordara, Cameron

Request: 6

Lab Test Details

Warn	Exclude	Analyte	Value	Result+Test	Lower limit	Upper limit	Units	Remarks
		Hemoglobin	14.0		11.0	16.0	g/dL	
		RBC	4.5		3.5	5.5	10^6/uL	
		HCT	42.0		37.0	50.0	%	
		MCV	83.0		82.0	95.0	fL	
		MCH	28.0		27.0	31.0	pg	
		MCHC	33.0		32.0	35.0	g/dL	
		RDW CV	12.0		11.5	14.3	%	
		RDW SD	41.0		39.0	56.0	fL	
		WBC	12.0		4.5	11.0	10^3/uL	
		NUK%	7.0		4.0	20.0	%	
		LYM%	22.0		21.0	45.0	%	
		MON%	2.0		2.0	10.0	%	
		EOS%	1.0		1.0	8.0	%	
		NEU%	71.0		68.0	73.0	%	
		LYM	1.0		1.5	4.0	10^3/uL	
		GRAN	8.0		2.0	7.5	10^3/uL	
		PLT	285.0		150.0	450.0	10^3/uL	
		ESR	12.0		0.0	150.0	mm/hr	

State: Draft Done

Done by: Finished on:

Validated by: Validated on:

tryton://localhost:8000/sandbox32/module/qnhhealth/lab?context=%7B%22date_formatt%22%3A=%22%25m%2F%25d%2F%25Y%22%7D&views=%5B402%2C409%5D



Dx Imaging

GNU Health

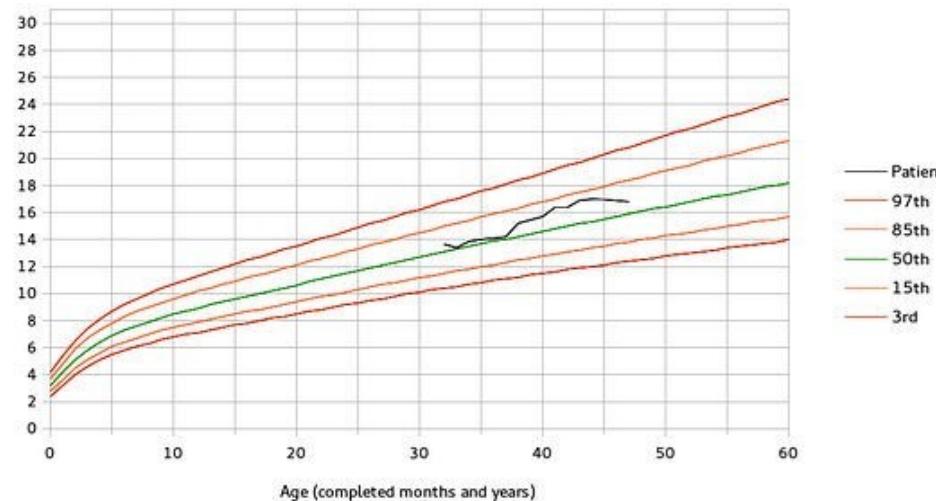
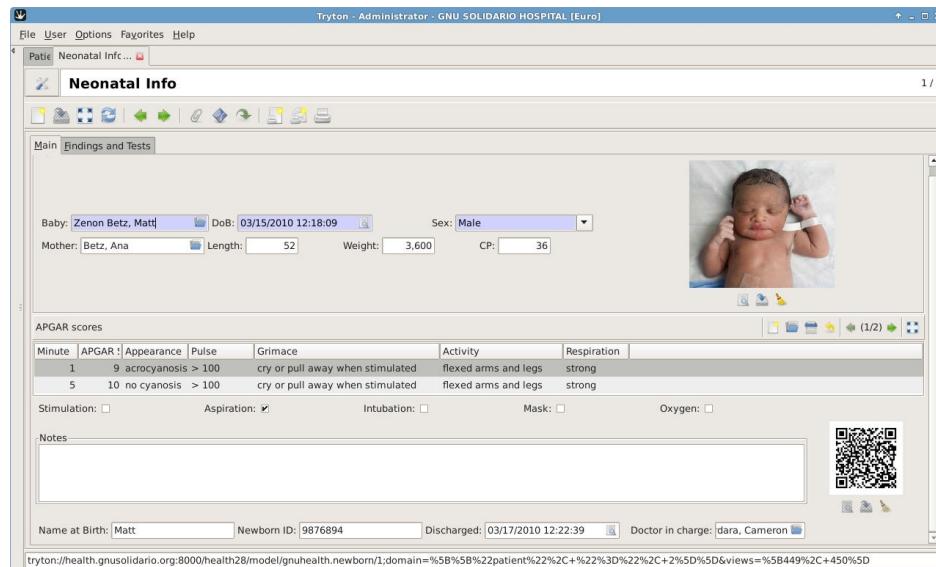


Can store the image, metadata
or DICOMDIR location

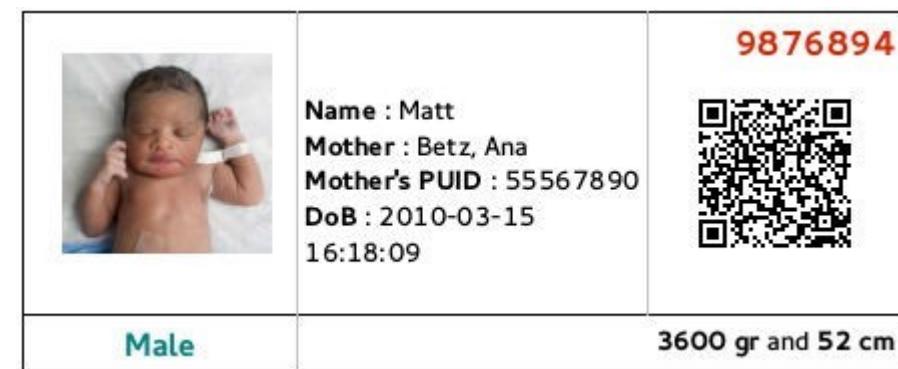
ORTHANC



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 (Mas General Hospital PSC)



Health Services, Billing / Invoicing

Screenshot of Tryton - Administrator - GNU SOLIDARIO HOSPITAL [Euro] showing the Health services module.

The left sidebar shows the navigation menu:

- Search
- Financial
- Currency
- Inventory & Stock
- Purchase
- Calendar
- Health
 - Patients
 - Institutions
 - Appointments
 - Prescriptions
 - Demographics
 - Laboratory
 - Imaging
 - Hospitalizations
 - Surgeries
 - Pediatrics
 - Archives
 - Nursing
- Health Services
 - Health services
 - Reporting
 - Configuration
- Administration

The main window displays the "Health services" list view with the following details:

Patient: Betz, Ana Date: 10/02/2013 ID: SERV 2013/001
Description: Hospitalization Services Invoice to: []

Service Line

Invoice	Product	Description	Qty	From	To
<input checked="" type="checkbox"/>	[BED 310] 310	Hospitalization	1	09/30/2013	10/02/2013
<input checked="" type="checkbox"/>	Medical evaluation	Initial assesment	1	09/30/2013	09/30/2013
<input checked="" type="checkbox"/>	Ultrasound charges	Abdominal Ultrasound - Req	1	09/30/2013	09/30/2013
<input checked="" type="checkbox"/>	[CBC] Blood count test charg	Complete Blood Count	1	09/30/2013	09/30/2013

State: Draft

tryton://health.gnusolidario.org:8000/health28rc1/model/gnuhealth.health_service/1;views=%5B517%2C+518%5D



Interoperability



Disease Groups

The screenshot shows two windows of the Tryton application interface. The top window is titled "Patients" and displays a patient record for "BETZ, ANA". It includes fields for gender (Female), age (29y 2m 3d), and ID (PAC001). A photograph of a woman is shown. The bottom window is titled "Diseases" and lists medical conditions: "Personal history of allergy to penicillin" (chronic), "Personal history of allergy to anaesthetic agent" (chronic), and "Leptospirosis" (healed). A green message bar at the top right of the diseases window says "Record saved! 1 / 108".

Tuberculosis example

Automatic triggers

Patient Critical Info

Reporting



Digital Signatures & ePrescriptions

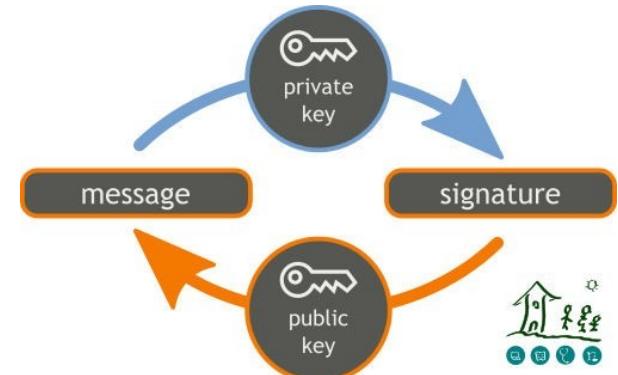
Digitally sign documents and medical acts

GNU Privacy Guard (GNUPG) Integration

Authenticity, accountability & non-repudiation

Document validation

The screenshot shows the Tryton application interface for a hospital. On the left is a sidebar with various menu items like 'Party', 'Configuration', 'Prescriptions', etc. The main window is titled 'Prescriptions' and shows a list of prescriptions. One specific prescription is selected, showing details such as patient name ('betz, ana'), prescription date ('05/20/2014 23:35:01'), and medication ('amoxicillin, ibuprofen'). Below the prescription list is a 'pinentry' dialog box. It asks for a passphrase to unlock an OpenPGP certificate belonging to 'Luis Falcon (meanmicio at GNU) <falcon@gnu.org>'. The dialog also displays a long string of characters representing the digest or key information.



ePrescriptions

Evaluations / Encounters

Birth and death certificates

Lab Tests, ...



health.gnu.org

Tools for the Health Authorities



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One person, one history : PUID

Screenshot of a software application interface showing a patient record for Ana Betz. The PUID (Patient Unique Identifier) is highlighted with a red box. The URL at the bottom of the screen is also highlighted with a red box.

Record saved! 1 / 6

Name: Ana Last Name: Betz PUID: 55567890

Active:

Health General Accounting Stock

Person: Patient: Health Prof: Institution: Insurance Company: Pharmacy:

-Demographics-

DoB: 10/04/1985	Sex: Female
Occupation: Teacher	Education Level: University
Mother: Luna	Father: Caput, Bonifacio
Marital Status: Married	Citizenship: Spain
Country of Residence: Spain	Domiciliary Unit: Valse-LeonyCastillo1
Ethnic group: Hispanic	Alternative IDs: <input checked="" type="checkbox"/>

Picture: 

Alternative IDs:

Code: 93674665J	ID type: Passport	Comments: Spanish Passport
Code: PAC001	ID type: Medical Record	

Insurances:

Number	Plan	Insurance Ty	Insurance Comp	Category	Member since	Expiration date
1257457	Family Plan	State	Universal Health	05/12/2012	05/12/2015	

Unidentified: Alias: Code: 63dd59be-141c-4ff9-a0a9-e43a6f Activation date: 01/17/2008

tryton://health.gnusolidario.org:8000/health28/model/party.party/2;domain=%5B%5B%22is_person%22%2C+%22%3D%22%2C+true%5D%5D&views=%5B%



Demographics, Epidemiology, Early Warning

Data aggregation

Demographics

People without health coverage

Vital Records System

Outbreak early warning

Geolocalization (OSM)

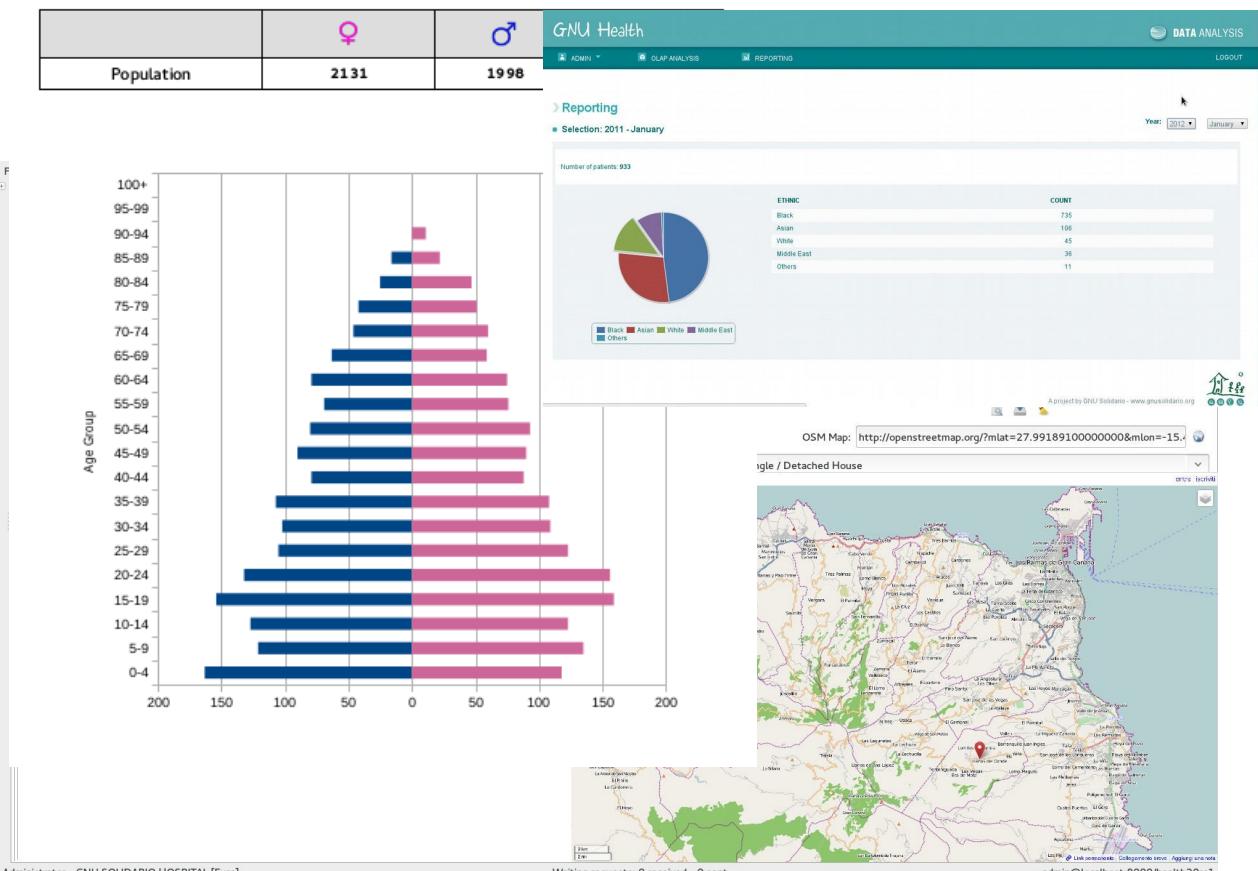
Notifiable diseases



Print Date: 10/11/2014 at 18:57:01

GNU Health Summary Report

Population Pyramid



Injury Surveillance System

Tryton - Administrator - GNU SOLIDARIO HOSPITAL [Euro]

File User Options Favorites Help

Patients Evaluations Injury Surveil ... Parties

Injury Surveillance System Registration

Record saved! 1 / 1

Code: 3446654656 Institution: GNU SOLIDARIO HOSPITAL

Evaluation: 2014-12-19 10:30:48 Injury Date: 12/19/2014 Registration Date: 12/19/2014

Location
O. Sector: Guanarteme Latitude: 28.12984000000000 Longitude: -15.44731000000000 OSM Map: <http://openstreetmap.org/?ml>

Patient Demographics
Patient: Ana Betz Sex: f Age: 29y 2m 15d

Specifics
Chief Complaint: pain in the wrist Injury Type: Motor Vehicle

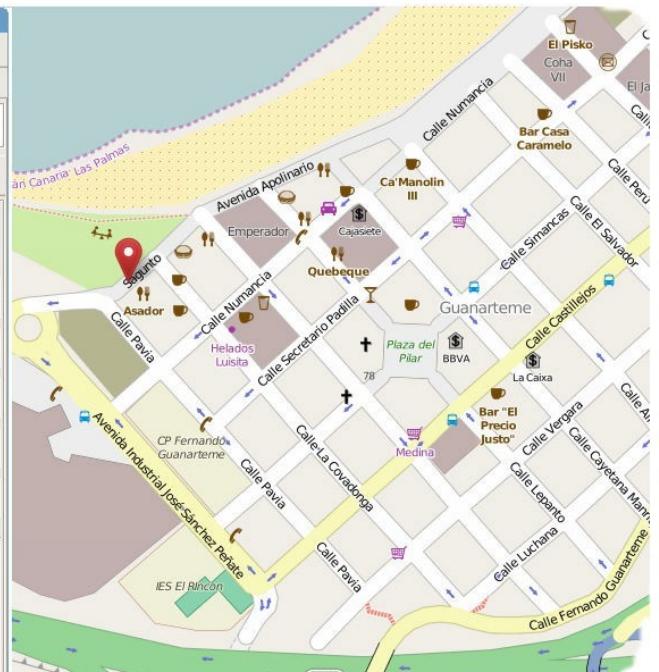
Motor Vehicle Accident
Mode: Bicycle User Position: Driver Counterpart: Car Safety Gear: Yes

Alcohol and other Drugs context
Alcohol: No Other Drugs: No

Details
A mother her son are safe, despite a cycling accident that sent the woman to the hospital with minor injuries. At just after 3pm yesterday, police, paramedics, and firefighters were dispatched to the intersection of Sanguto St. and Pavia for an accident involving a pickup truck and a 29-year old woman on a bicycle. Investigators at the scene tell GNU Solidario News that they believe the truck ran a red light and struck the back tire of the young woman's bicycle. The woman was apparently the first of the three bike riders on Sanguto that were crossing Pavia near the Alfredo Kraus Auditorium. The 29-year old woman was taken by ambulance to Negrín Hospital with non-life threatening injuries. Police investigators say speed and alcohol are not considered to be a factor in the accident.

Disposition
Treated and Sent Home

<tryton://localhost:8000/health28p/model/gnuhealth.iss/1;domain=%5B%5B%22name%22%2C+%22%3D%22%2C+2%5D%5D&views=%5B253%2C+254%5D>



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 !

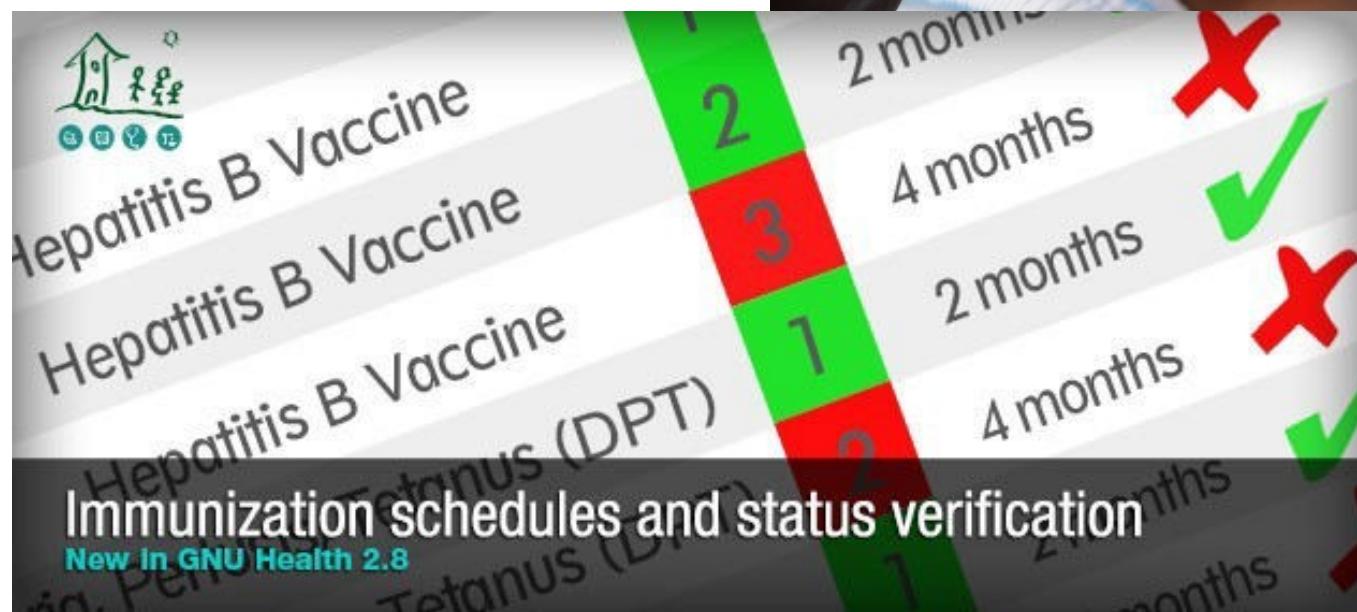


Health Campaigns

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

Immunization status of the population

Risk groups (obesity, diabetes, ...)



GNU Health embedded

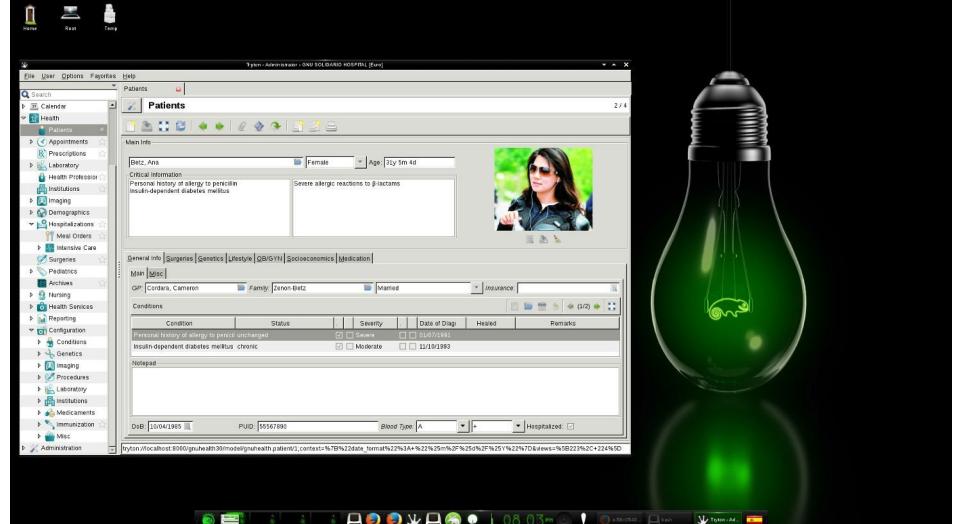


GNUHealth &
RASPBERRY PI

"GNU Health in a box"



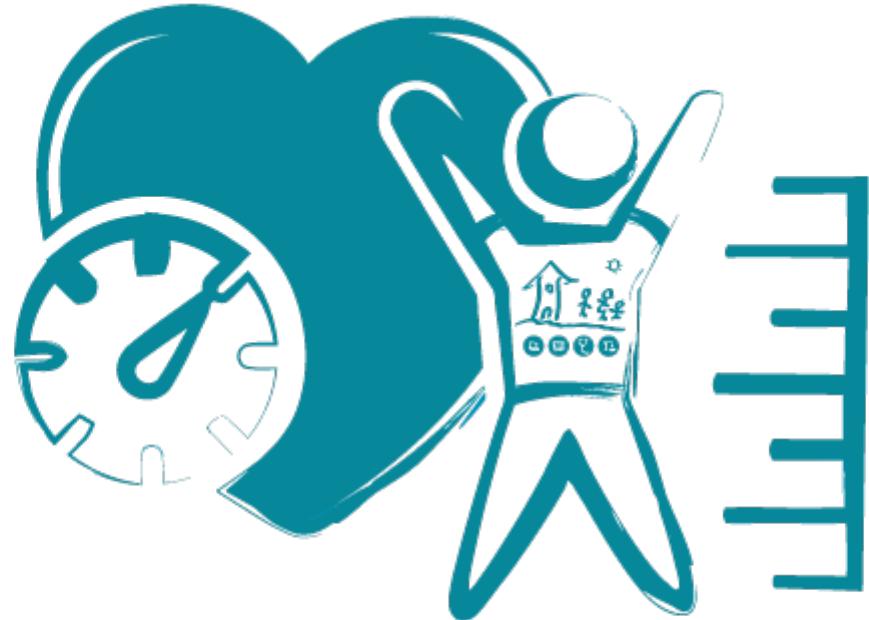
GNU Health & Raspberry Pi



Luis Falcón Martín
Gnu Solidario .
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Thanks openSUSE !

My GNU Health (3.4)



MyGNUHealth



MyGNUHealth (3.4)



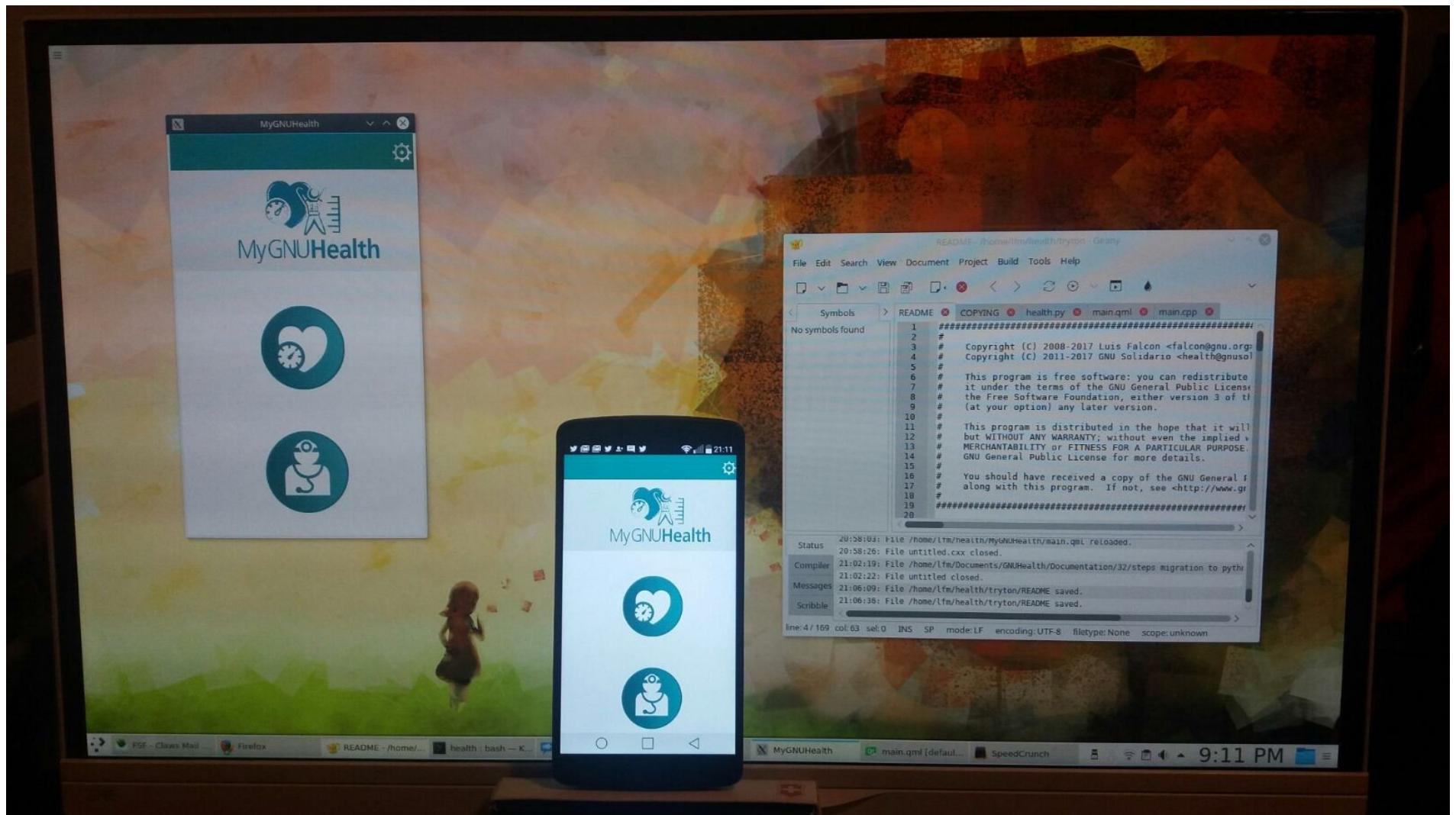
Demographics
Appointments
Telemedicine

BMI
Exercise
Vitals
Blood Glucose levels
Nutrition
Socioeconomics

Health History



Mobile and Desktop application



GNU Health Camera

The screenshot shows a software interface for managing patient data. On the left is a sidebar with various icons for managing parties, addresses, categories, products, financials, currencies, inventories, purchases, calendars, health professionals, institutions, imaging, demographics, hospitalizations, surgeries, pediatrics, archives, nursing, health services, reporting, configuration, and administration. The main window title is "Tryton - Administrator - GNU SOLIDARIO HOSPITAL [Euro]". The "People" tab is selected. A table lists patients with columns for PUID, Name, Family names, Patient status, Health Prof status, and Deceased status. A modal window titled "== GNU Health Camera ==" displays a video feed of a man with a beard.

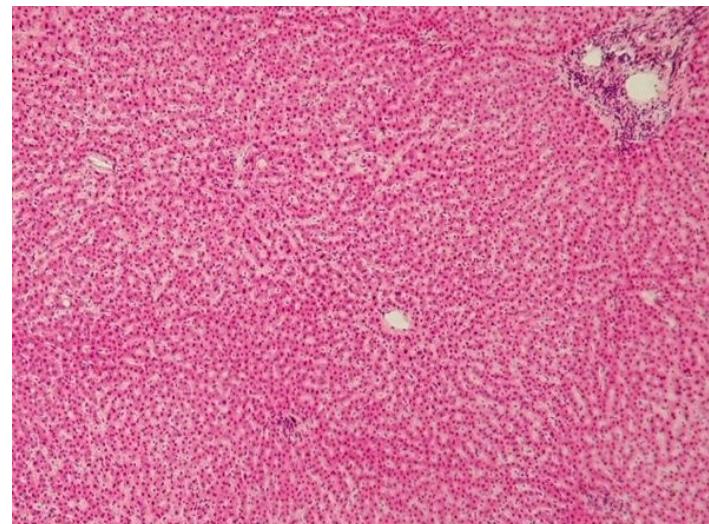


Person / Patient Registration

DUs Surveys

Dx Imaging

Histology / Pathology



GNU Health Federation

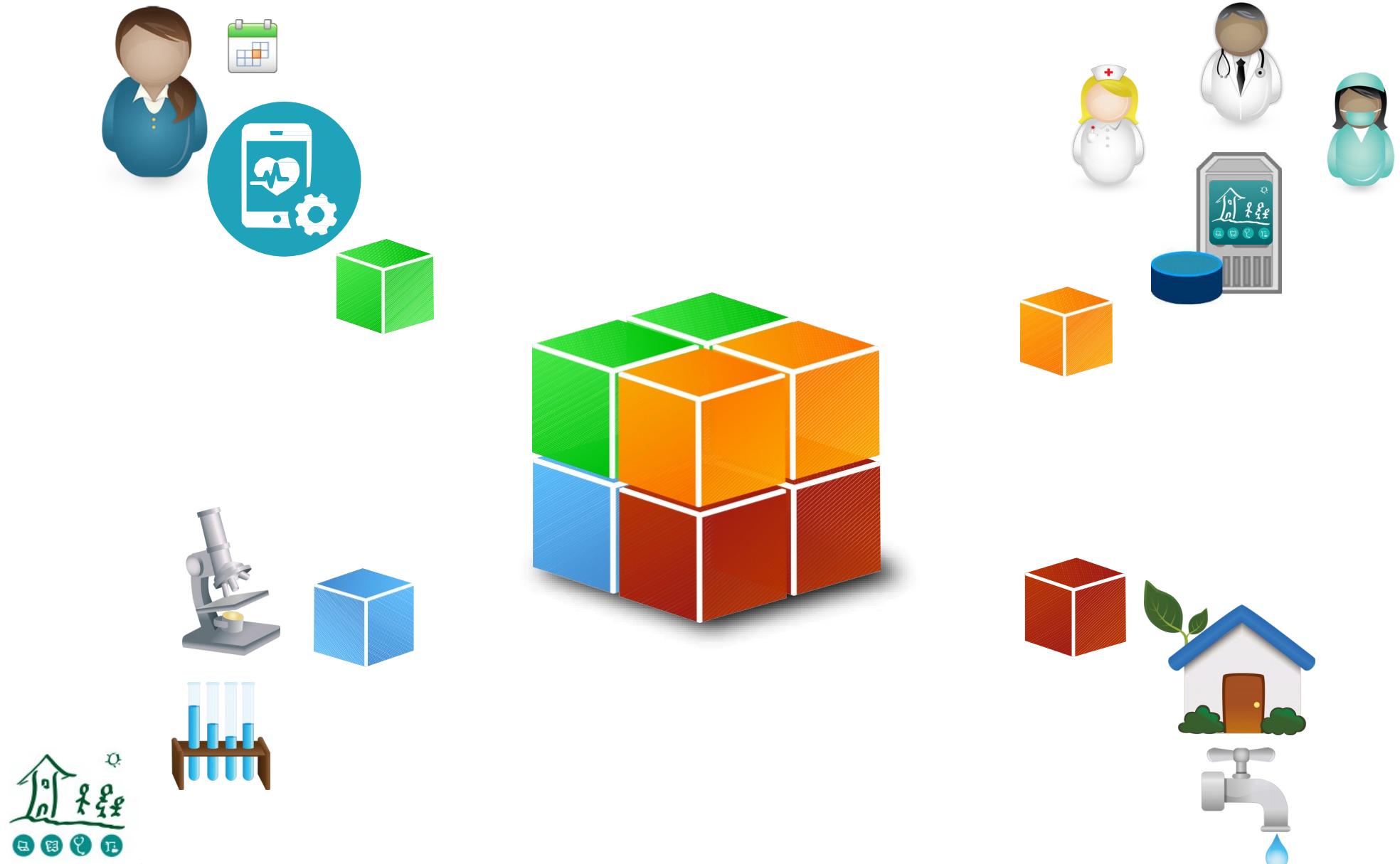


GNUHealth
FEDERATION

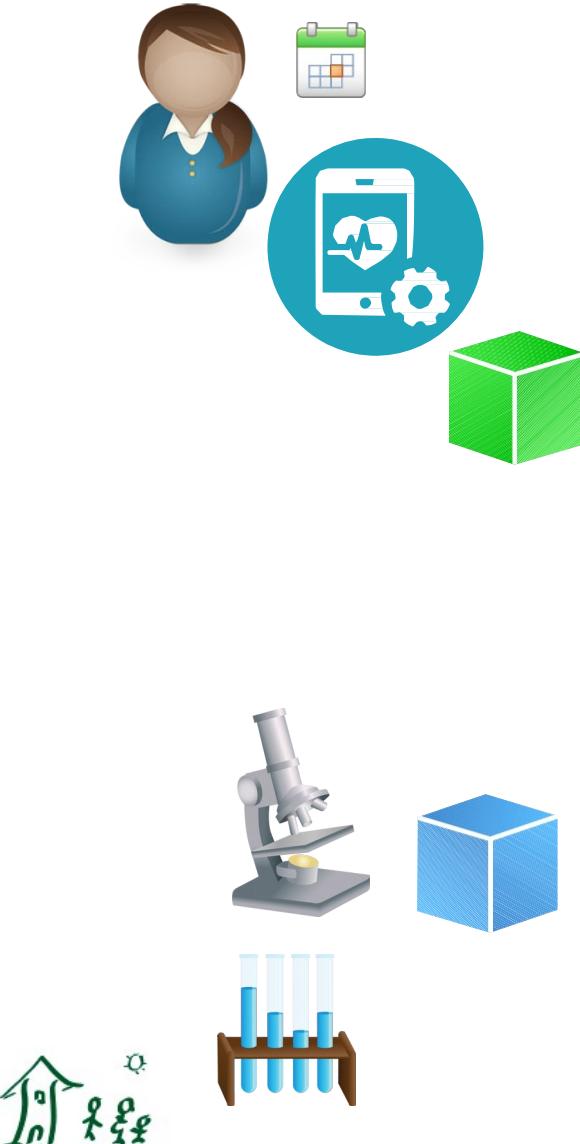
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 **GNUSolidario**

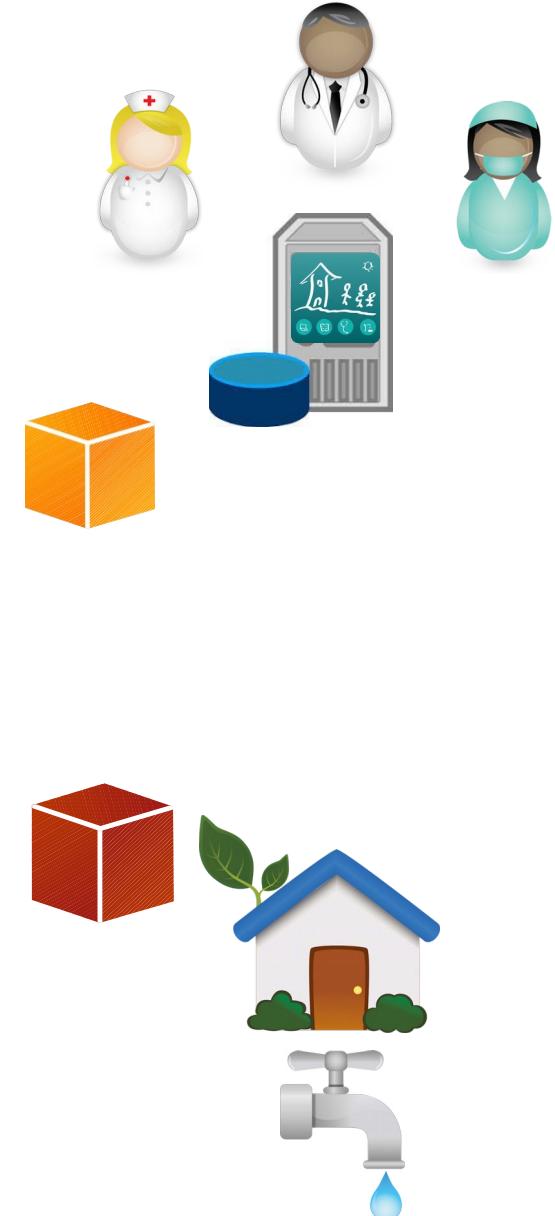
GNU Health Federation



GNU Health Federation



Autonomous
Distributed
Heterogeneous
Scalable
High availability
Secure



health.gnu.org

GNU Health Planet



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Thank you, geeko !



- * Active GNU Health member
- * Ships GNU Health package
- * Sponsor (GNUHealthCon)
- * Donation of Raspberry Pis
- * Great, friendly community



The Users

The difficult part - Users

The issue with Free Software Projects

We dont know our Users!

(at least for the most part)



GNU Health and the Academia



United Nations University, Kuala Lumpur, Malasia



University of Entre Ríos, 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



UNIVERSIDAD DE CIENCIAS MÉDICAS
Matanzas



Univ. Matanzas, Cuba



Univ. Palermo, Italy



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Universities...join the GNUHealth Alliance!

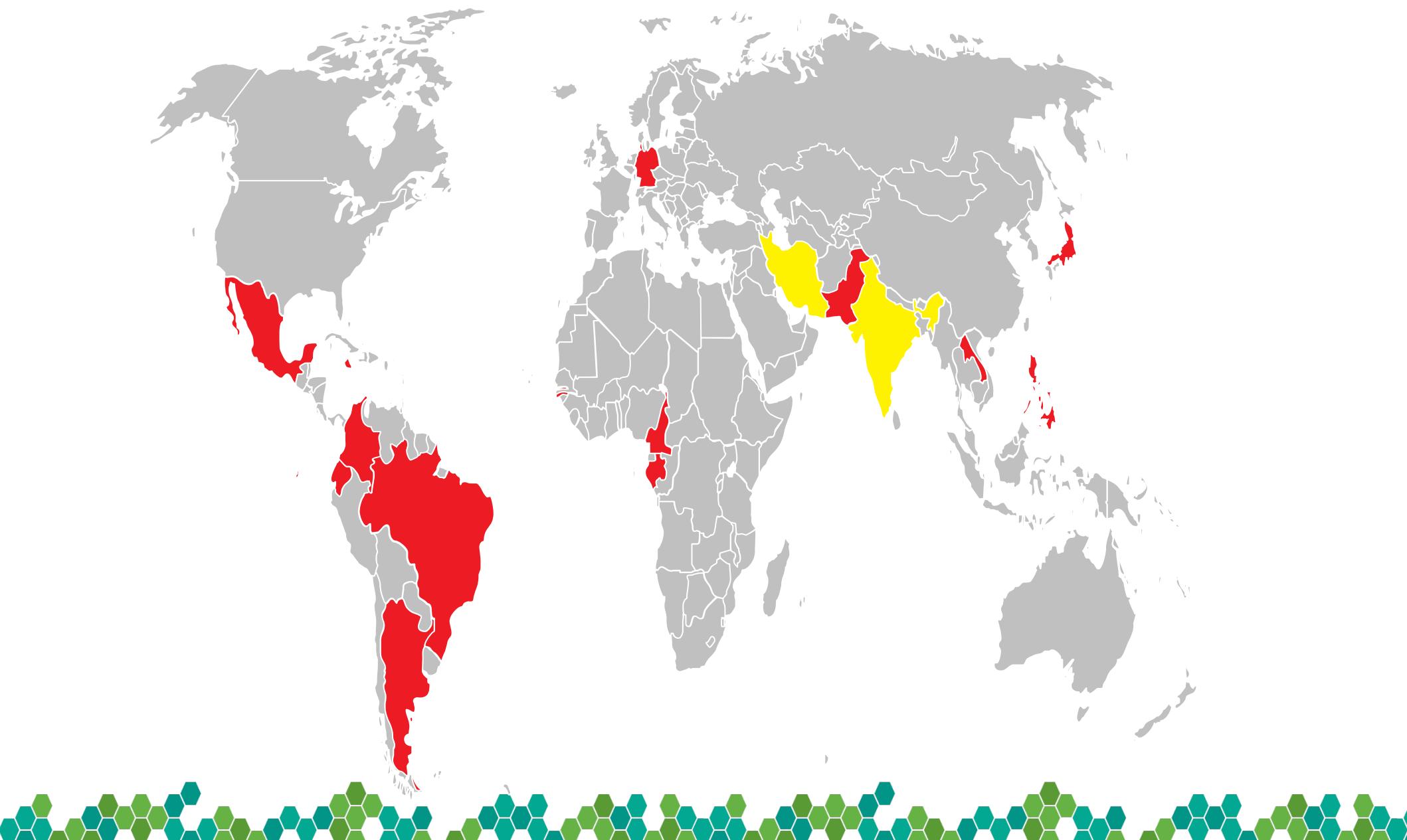


GNUHealth

ALLIANCE
OF ACADEMIC AND RESEARCH INSTITUTIONS



Users: Known implementations



GNU Health in Argentina



Argentina Public Health System

Province Entre Ríos

Since 2012, 8+ installations

Primary Care/Day Care/Hospital

Results

- .88% of users said they use it "Always" and 12% "Almost always".
- .71% said that the use of the system eased their work and in one case made it more difficult.
- .100% of the respondents stated that the system allows them to register and store the necessary information for their activity in the Hospital.
- .75% of respondents mention that the system contributes to improve the quality of patient care



Universidad Nacional de Entre Ríos, Argentina



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Daycare for homeless, refugees and persons without health insurance, Germany

Runs GNU Health since 2017

(migrated from openEMR)

Daycare center

4 nurses, 8 doctors

Monthly event with meals, medical and consulting services (debt, drug, etc)

40-80 visitors per event, 10-15 asking for med care

Budget: 0



GNU Health and Insolafrica



Insolàfrica



GNU Health & World Health Organization



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 & World Health Organization



Training sessions with WHO Africa regional officers



Sharab Medical Center Gambia

Runs GNU Health since 2016

14 beds

40 professionals

40 patients per day

Moved from GH 2.8 (Ubuntu)
to 3.2 on openSUSE

<http://www.sharabclinic.com/>



Bafia District Hospital Cameroon

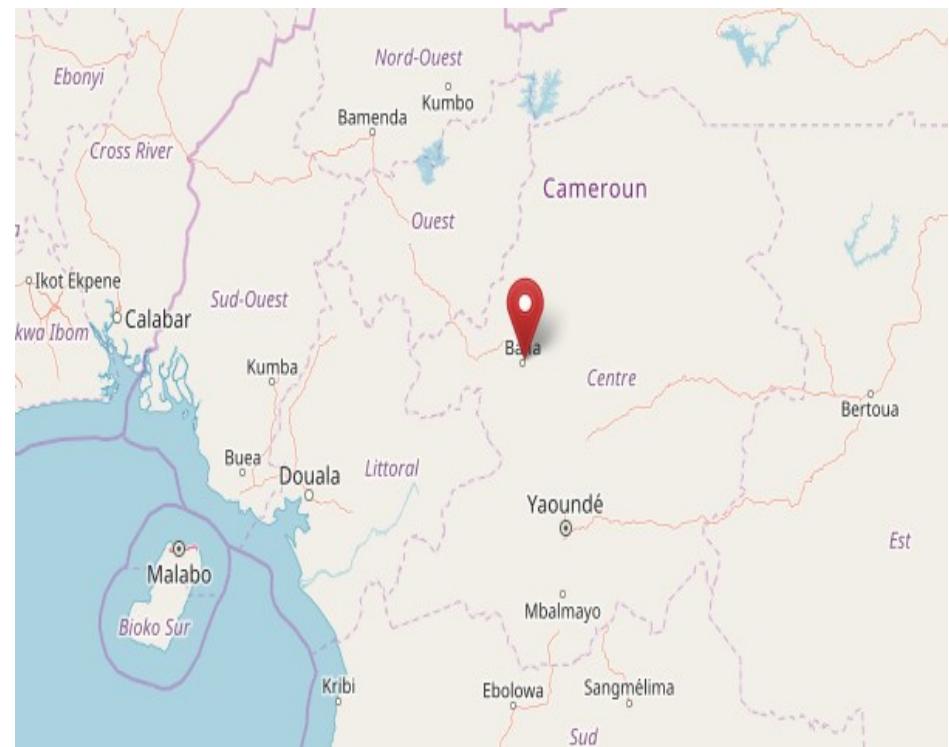
GNU Health since 2018

170 beds

110 professionals

50-100 patients per day

3 month prep &
2 month implementation



Cameroon – Public District Hospital



Challenges:

- Infrastructure
(Regular power cuts)
- low computer literacy



Bikop - Cameroon



Social Medicine at the heart of Africa



<http://health.gnu.org>



Pakistan, Islamabad



Dr. Akbar Niazi Teaching Hospital (ANTH), a 500-bed hospital in Islamabad



Dr. Akbar Niazi Teaching Hospital, Islamabad, Pakistan

Runs GNU Health since 2016

500 beds

150 professionals

250 patients per day

Budget: 0 (Inhouse team)

www.danthospital.com



Red Cross Mexico / Cruz Roja



Over 300,000 visits / year



Red Cross Mexico

Runs GNU Health since 2017 in 3 locations in Veracruz, Boca del Rio

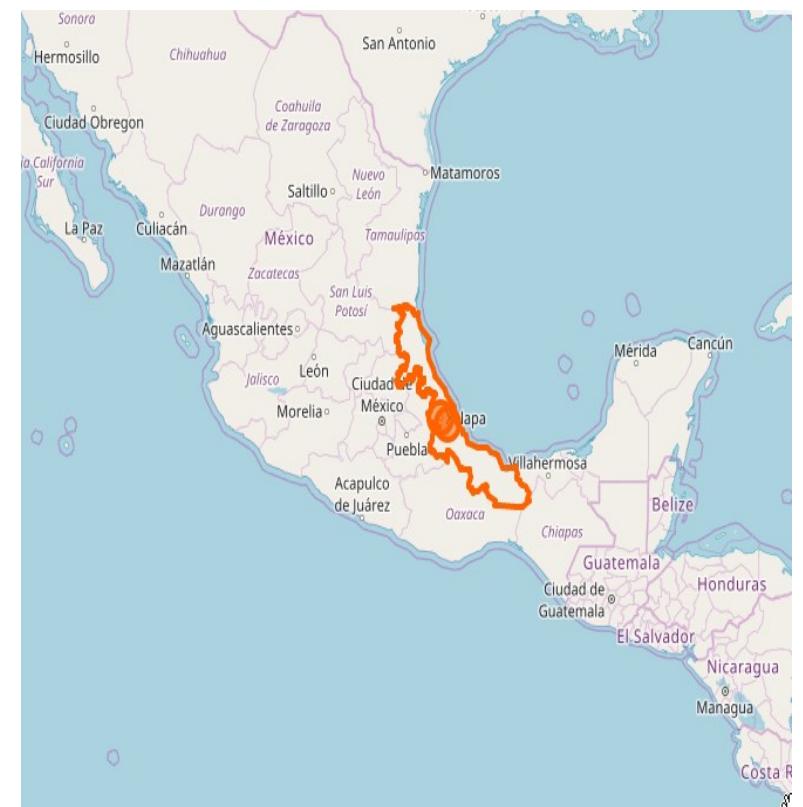
24 consulting rooms

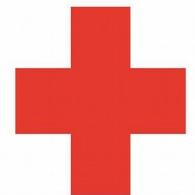
36 beds

14 ambulances

340 professionals

850 patients per day





CRUZ ROJA
MEXICANA
Delegación Veracruz-Boca del Río

Red Cross Mexico - before

- Accounting system does not comply all the needs → • Manual work
- No system for inventory control
- Only physical medical records
- Hospitalization system does not comply all the needs
- Good system for emergency calls control but, completely independet to the others
- ...and some more issues



CRUZ ROJA
MEXICANA
Delegación Veracruz-Boca del Río

Red Cross Mexico - after

Consulting appointments

Accounting

Electronic Medical Records

Inventory Control

Purchase

Imagenology

Pharmacy (POS)

Hospitalizations

Laboratory



Cash collection

Payments

Emergencies



Mexico



GNUHealth at the Government of Jamaica



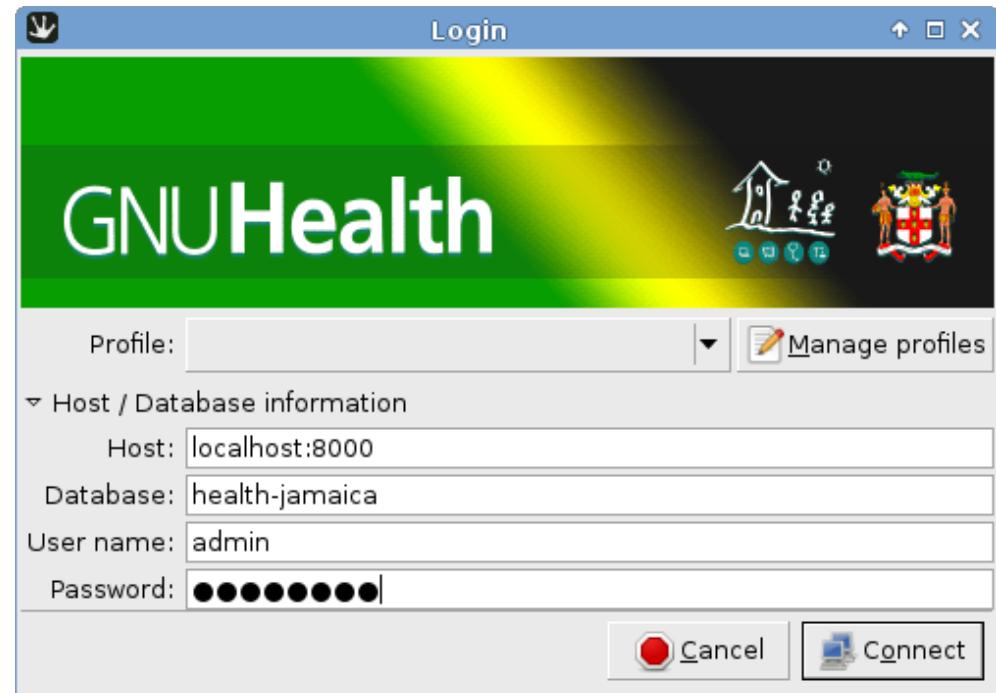
Unique ID for each individual across the country

GNU/Linux on both workstations and servers

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

Local team

Sustainability and independence



350+ “GNU” Health facilities nation-wide

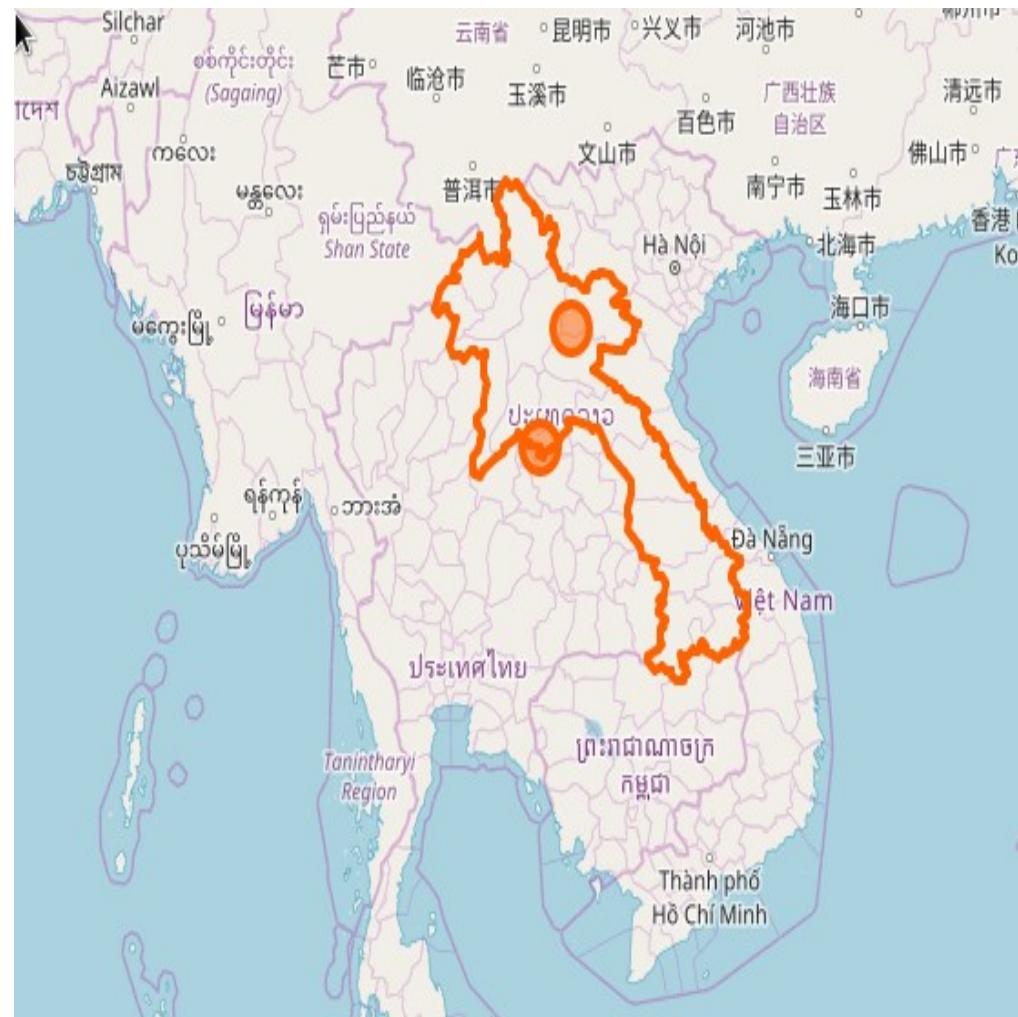


Center for Medical Rehabilitation (CMR) Laos

Runs GNU Health
since 2014

Service for
amputees and
rehabilitation

Module for health
disability

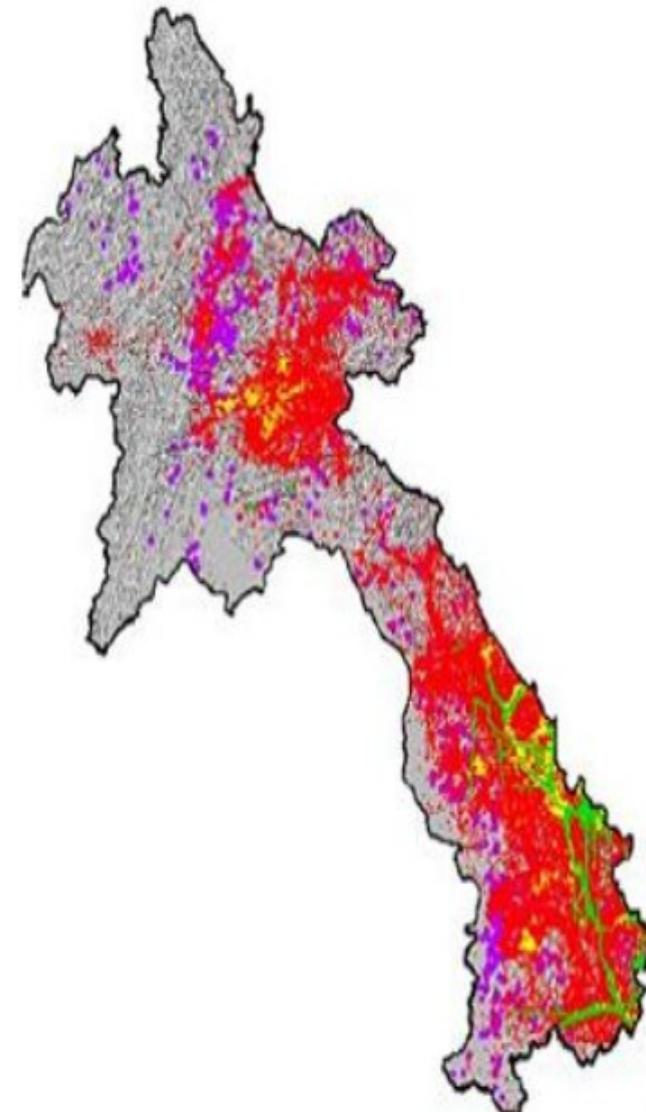


Center for Medical Rehabilitation (CMR) Laos

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disability



GNU Health at Laos Public Health System



Mahosot Hospital Vientiane, Laos

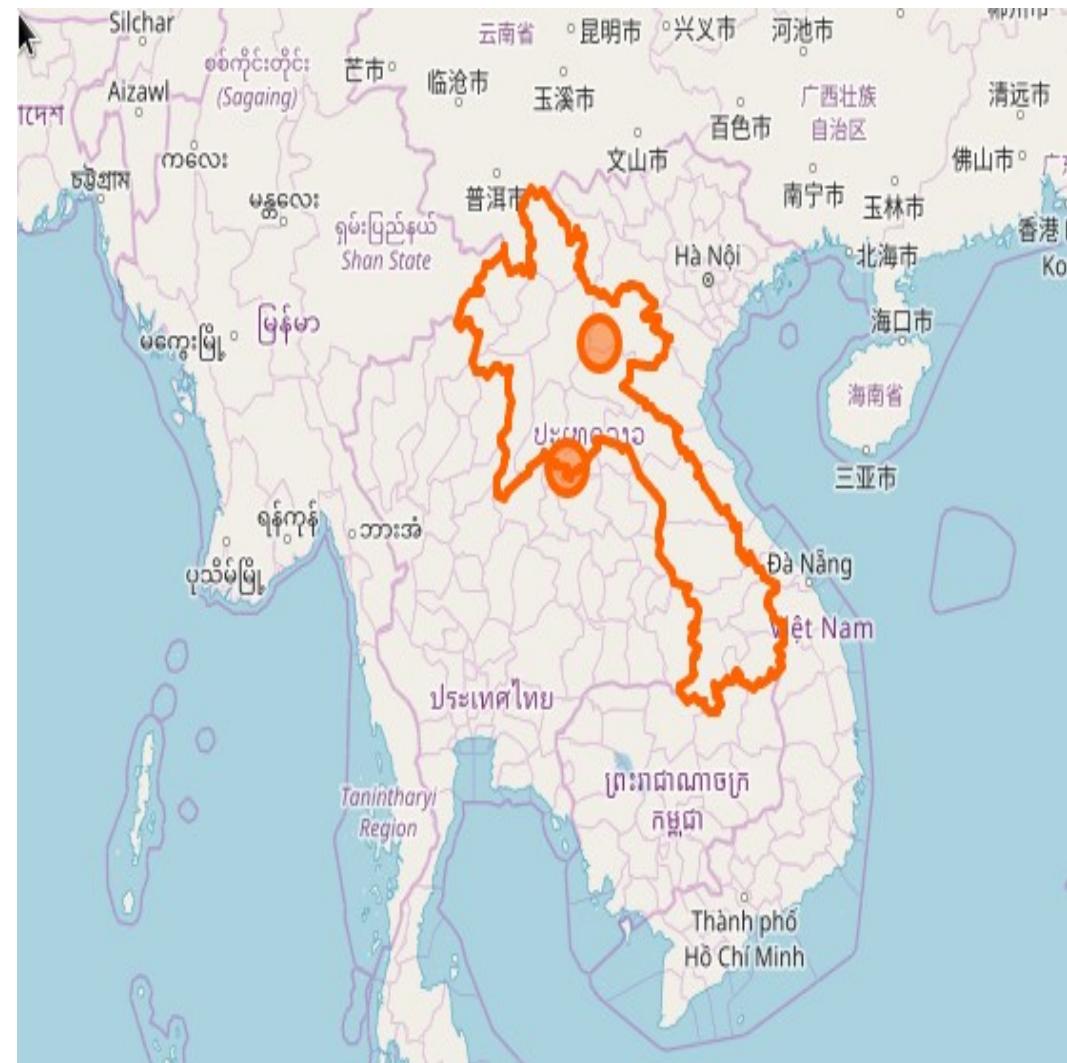
Runs GNU Health
since 2016

Old & complex building,
partly since french
colony

600 beds

Completed translation
to Lao language

Introduced by same
team as CMR



Welcome, AIIMS!



All India Institute of Medical Sciences, AIIMS

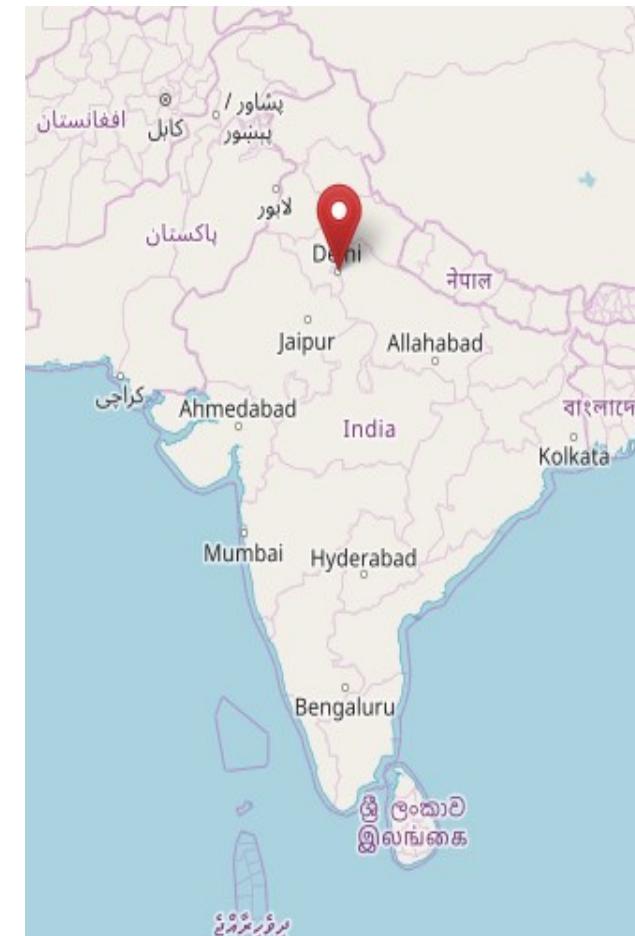
Largest public health hospital in Asia



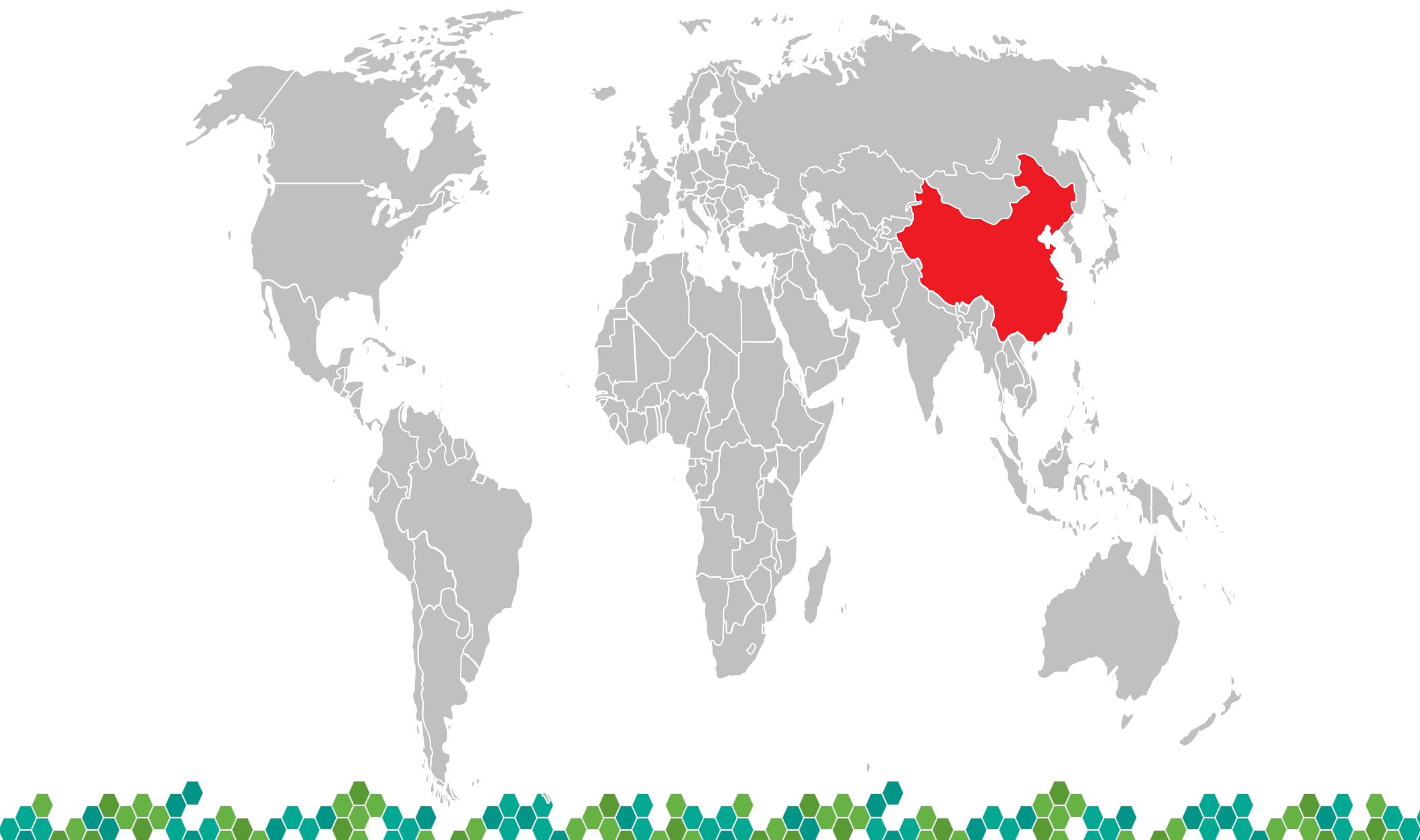
All India Institute of Medical Science

GNU Health implementation in progress

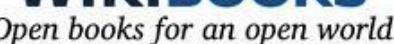
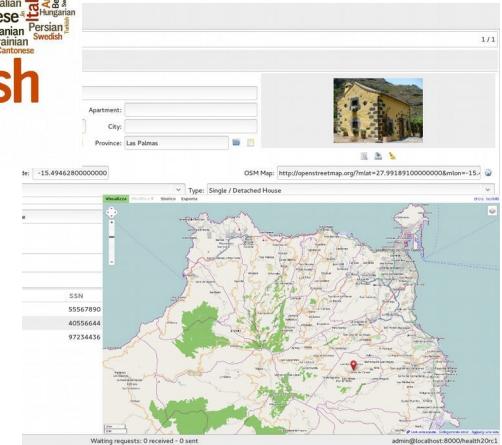
- Largest public hospital in Asia
- 3.500 beds
- 3.5 Mio examinations/year
- 70 FTE internal IT staff
- openSUSE as backbone



A white spot...



Some cool areas of work



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Reach out !



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Community involves humans

**Treat them with respect
otherwise they may get strange**

IWEEE & GNUHealthCon 2018

Celebrating 10 years of Freedom and Equity in Healthcare



November 23 -25, Las Palmas, Spain

<http://www.gnuhealthcon.org>



See you at GNU Health Con 2018



GNUHealth

10
CON
2018

YEARS ANNIVERSARY

III International GNU Health Conference - "10 Years of Freedom and Equity in Healthcare"
Nov 23-25, Las Palmas, Spain #GNUHealthCon2018

Health is a non-negotiable human right



<http://health.gnu.org>



@gnuhealth



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