

Introduction to GNU Health



The Free, Community-based, Hospital and Health Information System

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GIZ, Bonn
27 Feb 2019

Axel Braun
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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)

GNUHealthCon - IWEEE

International Workshop on E-Health in Emerging Economies.



GIZ, Bonn
27 Feb 2019

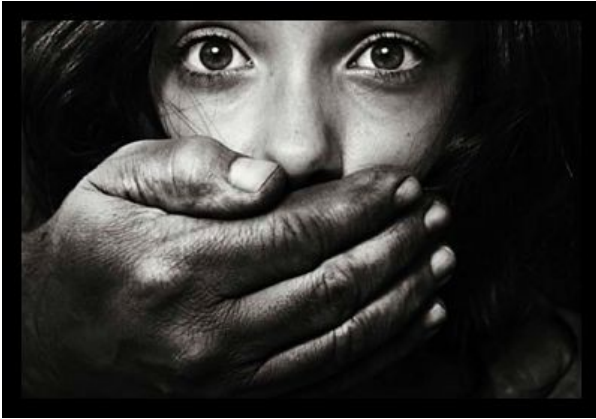
The System of Disease



Les Misérables



Over 20.000 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 business of war



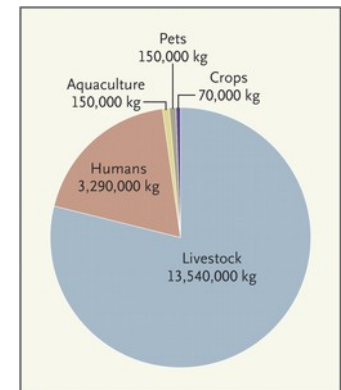
80% of diseases in LMICs due to poor sanitation / unsafe water (UN)



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



New England Journal of Medicine
Dec 26, 2013

Factory farming accounts for 37% of methane (CH₄) emissions, 20 times the global warming potential of CO₂.



GNU Health : Freedom and Equity in Health



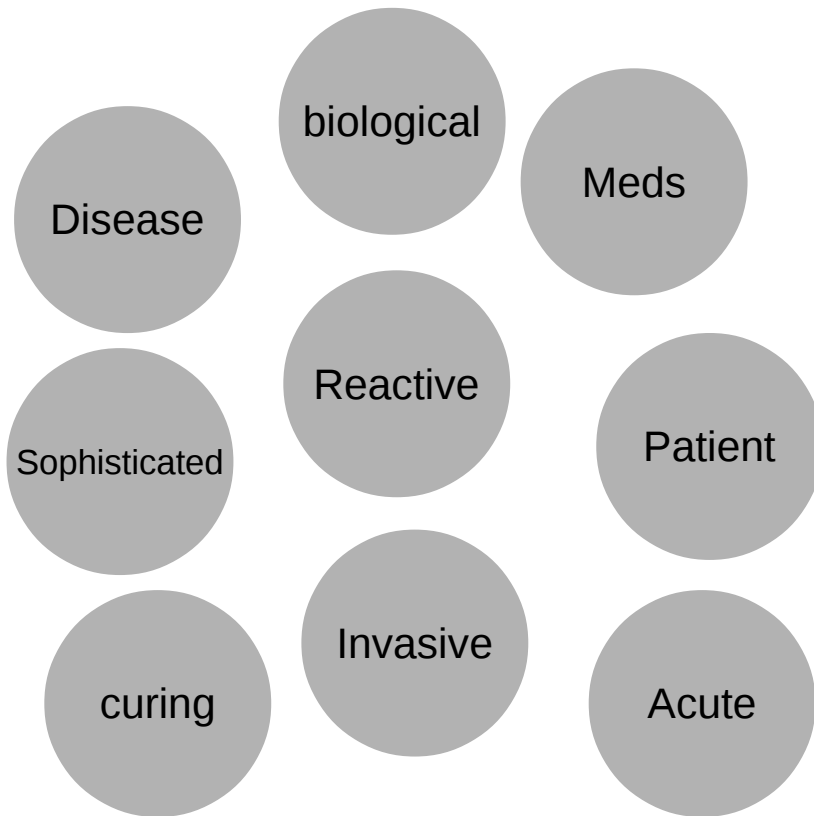
Social Medicine

- "La medicina sin humanismo médico no merece ser ejercida."
Professor Dr. Rene Favaloro -

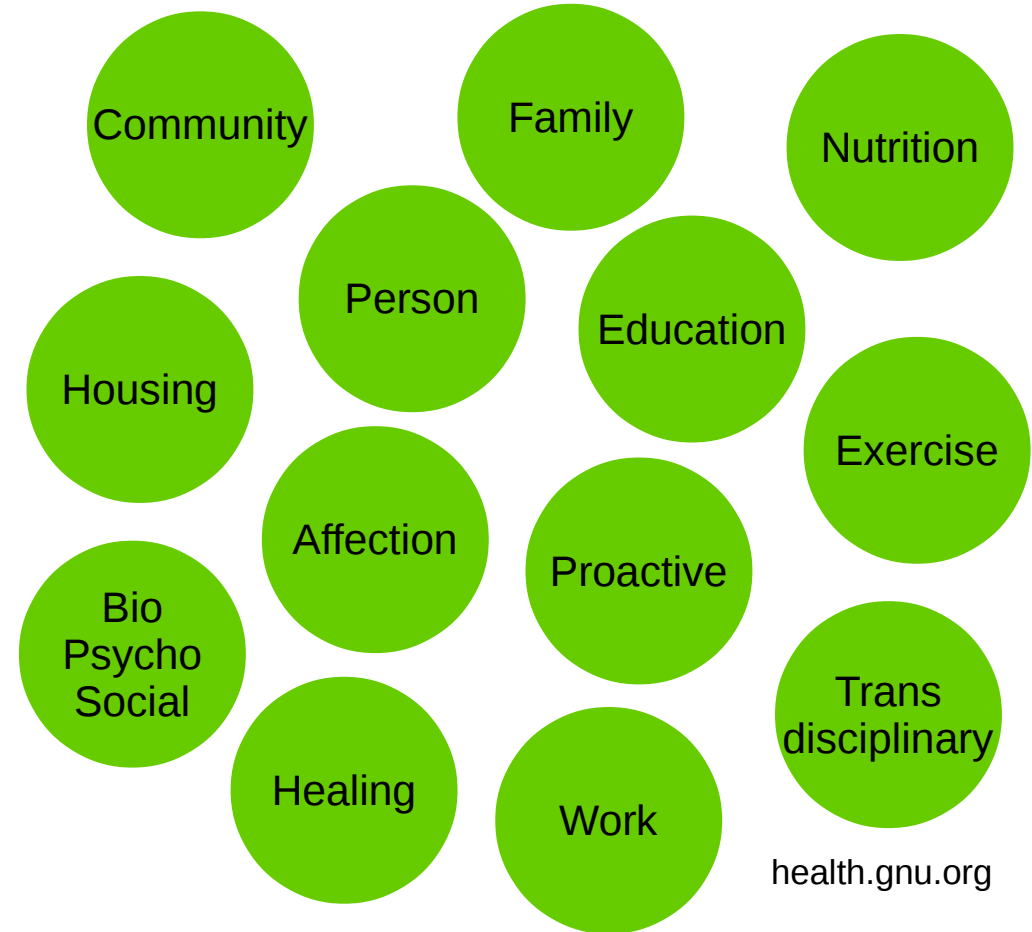


The System of Health Paradigm

System of Disease



System of Health



health.gnu.org



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

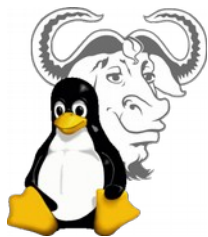
Freedom to run , adapt, improve and redistribute

Official GNU Package, from the Free Software Foundation

Open Documentation

Relies on free technology

International community (100+ language teams)



Introducing GNU Health Federation



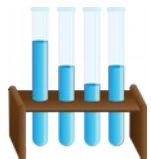
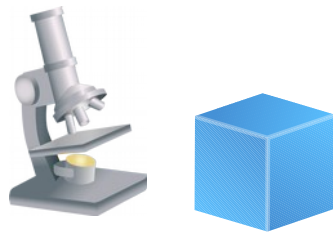
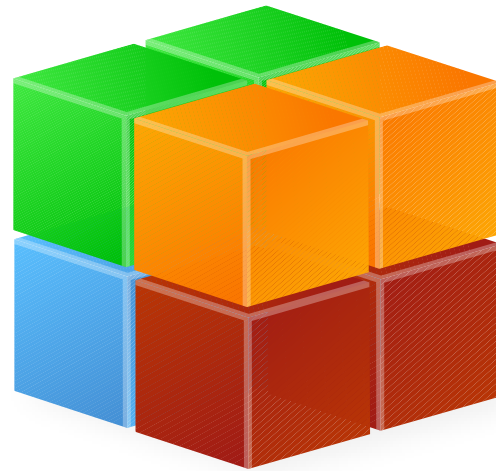
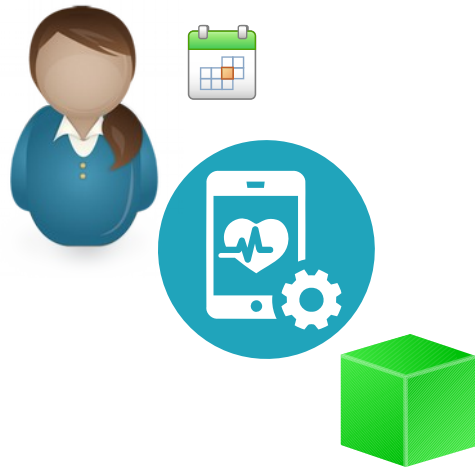
GNUHealth
FEDERATION

 **GNUSolidario**

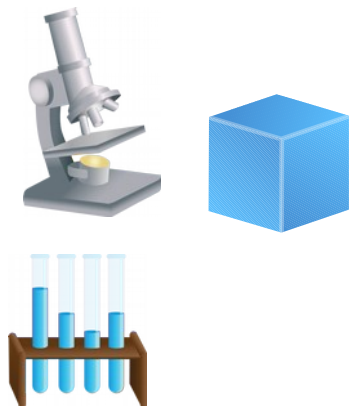


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GNU Health Federation Model



GNU Health Federation Model



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Autonomous
Distributed
Heterogeneous
Scalable
High availability
Secure



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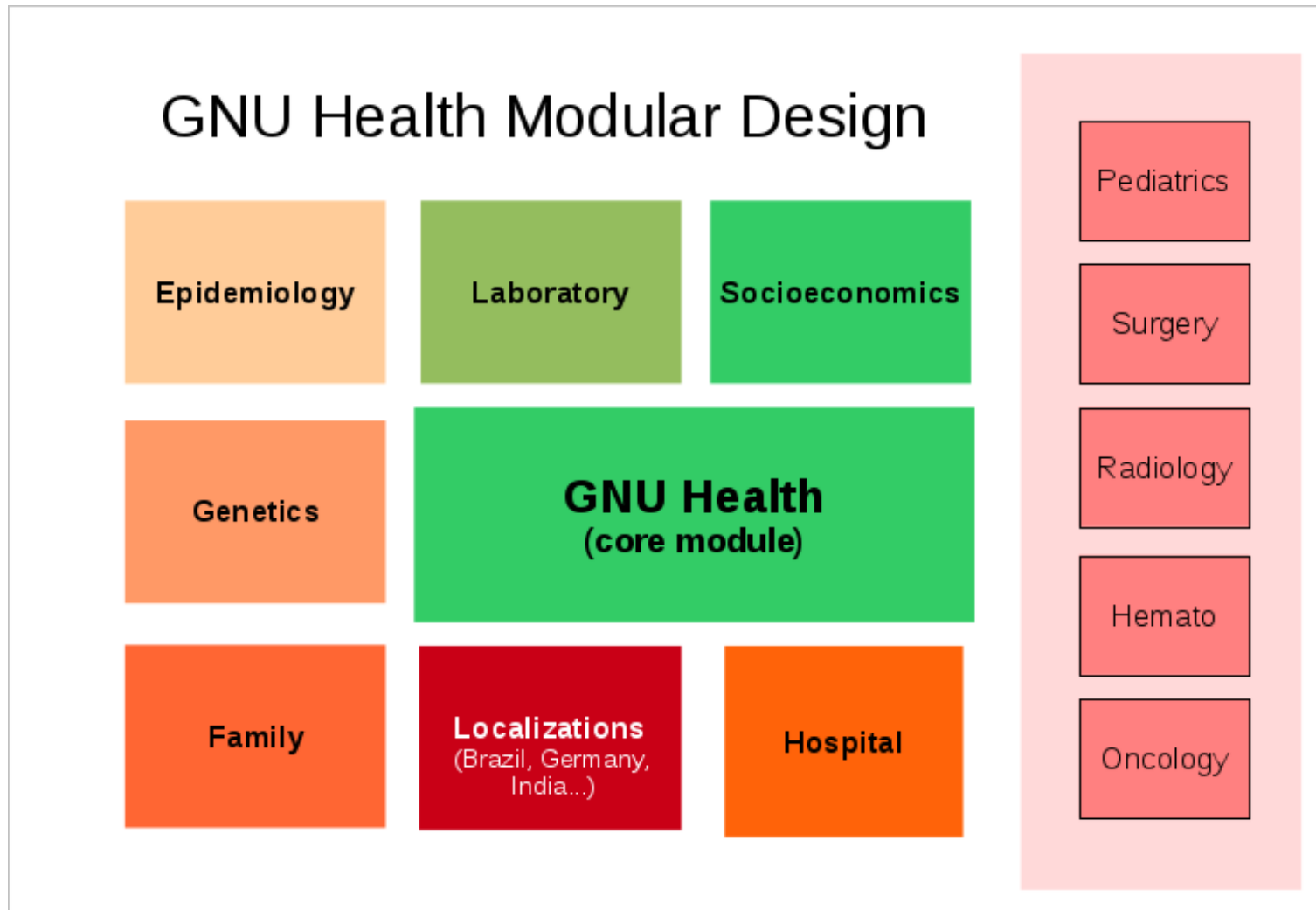
Thalamus – GNU Health Federation Message Server



HL7 support - FHIR



Modularity



Modularity

GNU Health' modularity allows

- tailor installations according to need**
- flexibility**
- easy adaption to changed needs**
- modular extentions (OO approach)**



People before Patients Social Medicine



The Domiciliary Units (DUs)

Address / Location
Construction material
Number of rooms

Sanitary conditions

Bathrooms
Sewers
Electricity

...

The screenshot shows a web application interface for Domiciliary Units (DUs). The interface is divided into several sections:

- Form Fields:**
 - Code: Valse-LeonyCastillo
 - Desc: House by the city town hall.
 - Street: Leon y Castillo
 - Number: 1
 - Apartment: (empty)
 - District: (empty)
 - Municipality: Valsequillo
 - City: (empty)
 - Zip Code: 35217
 - Country: Spain
 - Province: Las Palmas
 - Latitude: 27.99189100000000
 - Longitude: -15.49462800000000
 - OSM Map: <http://openstreetmap.org/?mlat=27.99189100000000&mlon=-15.49462800000000>
 - Conditions: Comfortable and good sanitary conditions
 - Infrastructure: Material: Concrete, Roof: Concrete
 - Bathrooms: 2
 - Running Water:
 - Gas supply:
 - Telephone:
 - Type: Single / Detached House
- Members Table:**

Code	Name	Last Name	SSN
2	Ana	Betz	55567890
5	John	Zenón	40556644
4	Matt	Zenon Betz	97234436
- Map:** A map showing the location of the Domiciliary Unit in Las Palmas, Spain. The map is linked to OpenStreetMap.

At the bottom of the interface, there is a status bar with the following information:

- 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



People Before Patients : Demographics

Name: Last Name: PUID:

Active:

HHealth General Accounting Stock

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

Demographics

DoB: Sex:

Occupation: Education Level:


Mother: Father:

Marital Status: Citizenship:

Country of Residence: Domiciliary Unit:

Ethnic group: Alternative IDs:

Picture



Alternative IDs

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



Families

Tryton - Administrator - GNU SOLIDARIO HOSPITAL [Euro]

File User Options Favorites Help

Search

Health

- Patients
- Institutions
- Appointments
- Prescriptions

Demographics

- Domiciliary Units
- Birth certificates
- Death certificates
- Families
- Family Members
- Operational Area:
 - Laboratory
 - Imaging
 - Hospitalizations
 - Surgeries
 - Pediatrics

Domiciliary L... Families

Families

1 / 1

Family: Zenon-Betz

Members

Family Members

Party	Role
Betz, Ana	Mother
Zenon, John	Father
Zenon Betz, Matt	Son



Extra Info

tryton://health.gnusoledario.org:8000/health28/model/gnuhealth.family/1;views=%5B167%2C+168%5D

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



Empowering the person, family and community

	<p>Name : Betz, Ana</p> <p>DoB : 1985-10-04</p> <p>Blood Type : A +</p>	<p>55567890</p> 
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**

...

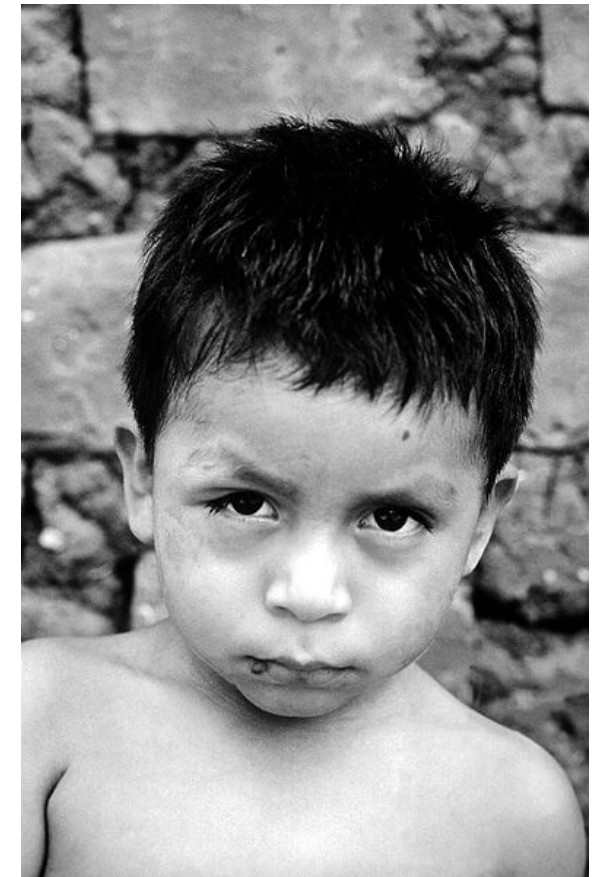
GNU Health promotes transdisciplinary work, and makes the person an active member of the system of health



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 / Vector Control

Tryton

File User Options Favorites Help

Search

- Party
- Product
- Financial
- Currency
- Inventory & Stock
- Purchase
- Sales
- Calendar
- Health
 - Patients
 - Appointments
 - Prescriptions
 - Demographics
 - Domiciliary Units**
 - Families
 - Family Members
 - Operational Areas
 - Laboratory

Domiciliary U ... Chagas DU S ...

Chagas DU Survey 1 / 1

Survey Code: CHAGAS-DU-2013/001 DU: DUsample-X1230 Date: 07/28/2013 Status: Initial

Presence of triatomines

Triatomines: Nymphs: Domiciliary: Peri-Domiciliary: Vector: T. infestans

Areas to Improve

Roof: Walls: Floor:

Preventive Measures

Bug traps: Fumigation: Fumigation Date: 07/27/2013

Notes

Triatomines found in the roof section of the bedroom.

Action : House has been sprayed and the social worker notified the family to place bug traps for further evaluation.

Next survey: 08/03/2013

Administrator - GNU SOLIDARIO HOSPITAL [EGP] Waiting requests: 0 received - 0 sent admin@health.gnusolidario.org:8000/health20

vinchucachaco.jpg

Image Edit View Go Help



Medical Practice and Health Center Management



Health Institutions and Operational Sectors

The screenshot displays the 'Institutions' configuration page in the GNU Solidario Hospital Administrator. The interface includes a sidebar with a search bar and a tree view of modules such as Party, Product, Financial, Currency, Inventory & Stock, Calendar, Health, Patients, Institutions, Appointments, Prescriptions, Demographics, Laboratory, Imaging, Hospitalizations, Surgeries, Pediatrics, Archives, Nursing, Health Services, Reporting, Configuration, and Administration.

The main content area is titled 'Institutions' and shows the configuration for 'GNU SOLIDARIO HOSPITAL'. A context menu is open over the 'Beds' field, listing options: Beds, Buildings, Operating Rooms, Units, and Wards. The configuration fields include:

- 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:

The 'Institution Picture' section shows a photograph of a modern hospital building. Below this are sections for 'Specialties' (listing Nutrition and Cardiovascular) and 'Operational Sector' (listing Las Palmas de Gran Canaria).

At the bottom, there is a descriptive text block:

The GNU Solidario General Hospital (GSGH), is a major fictional teaching hospital in Las Palmas, and core of the automomic region health network. GNU Solidario General Hospital has research units covering nearly all major specialties of medicine and is the primary teaching hospital in the island. The hospital's emergency department is certified as a level I trauma center for adults and pediatrics. It is the sample health center used in the demo system.

The URL at the bottom of the browser window is: `tryton://localhost:8000/health26/model/gnuhealth.institution/1;views=%5B603%2C+604%5D`



Centralized Patient Information

Tryton - Administrator - GNU SOLIDARIO HOSPITAL [Euro]

File User Options Favorites Help

Search

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

People Birth Certific... Patients

Patients 1 / 3

Main Info

Betz, Ana

Critical Information

Personal history of allergy to penicillin
Insulin-dependent diabetes mellitus

Age: 29y 4m 8d

ctions to β -lactams

Appointments
Evaluations
Imaging Test Request
Imaging Test Results
Lab Reports
Neonatal Info
Obstetric History
PSC
Prescriptions
RCRI
Request Imaging Test
Request Lab Test
Surgeries
Vaccinations

General Info Socioeconomics Medication

Main Misc

GP: Cordara, Cameron Family: Zenon-Betz Married Insurance: Universal Health : 1257457

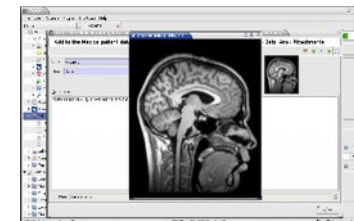
Notepad

DoB: 10/04/1985 PUID: 55567890 Blood Type: A + Hospitalized:

tryton://health.gnusolidario.org:8000/health28/model/gnuhealth.patient/1;views=%5B223%2C+224%5D

Name : Betz, Ana
DoB : 1985-10-04
Blood Type : A +
55567890
Female
Critical Info : T1D

Name	DoB	PUID	Blood Type	Hospitalized
Betz, Ana	1985-10-04	55567890	A +	<input checked="" type="checkbox"/>



Interoperability : Labs

The image is a composite showing three related elements of a laboratory information system:

- Top Left:** A row of laboratory test tubes with various colored caps (blue, yellow, purple, red).
- Bottom Left:** A terminal window showing a command prompt session:


```
lfm@beastie:~/health/tryton/doc/
Connecting to GNU Health Server
Connected !
Checking integrity of the batch
Basic check on test ID and analy
Updating lab results from batch
Done !
```
- Right:** A screenshot of the 'Lab Tests Results' web interface. The interface shows patient information (Betz, Ana), test details (ID: TEST006, COMPLETE BLOOD COUNT), and a table of results. The table includes columns for Warn, Exclude, Analyte, Value, Result - Test, Lower Limit, Upper Limit, Units, and Remarks. The 'WBC' row is highlighted in blue.



Obstetrics & Pediatrics

Tryton - Administrator - GNU SOLIDARIO HOSPITAL [Euro]

File User Options Favorites Help


Patte Neonatal Inf...

Neonatal Info 1/1

Main Endings and Tests

Baby: Zenon Betz, Matt DoB: 03/15/2010 12:18:09 Sex: Male

Mother: Betz, Ana Length: 52 Weight: 3.600 CP: 36



APGAR scores

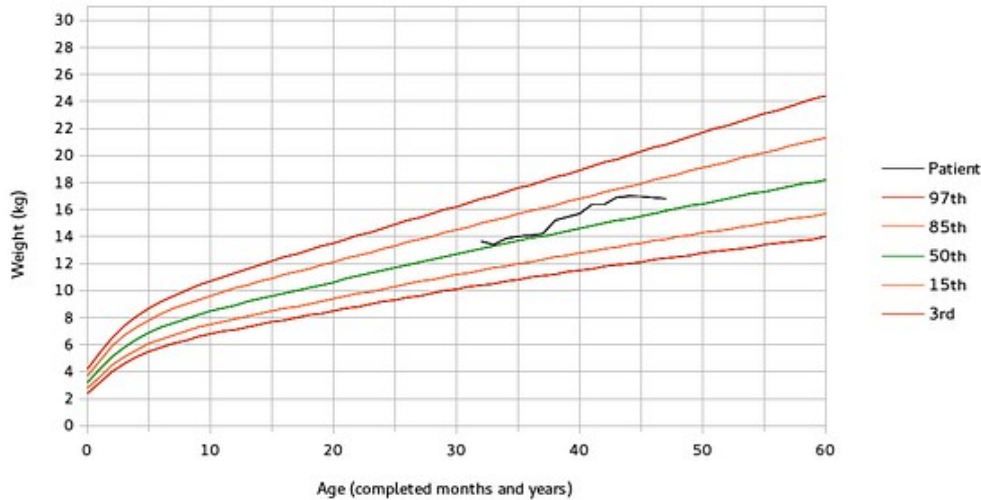
Minute	APGAR	Appearance	Pulse	Grimace	Activity	Respiration
1	9	acrocyanosis > 100	cry or pull away when stimulated	flexed arms and legs	strong	
5	10	no cyanosis > 100	cry or pull away when stimulated	flexed arms and legs	strong	

Stimulation: Aspiration: Intubation: Mask: Oxygen:



Notes

Name at Birth: Matt Newborn ID: 9876894 Discharged: 03/17/2010 12:22:39 Doctor in charge: Dara, Cameron

tryton:/health.gnusoledario.org:8000/health28/model/gnuhealth.newborn/1.domain=%5B%5B%22patient%22%2C+%22%3D%22%2C+2%5D%5D&views=%5B449%2C+450%5D

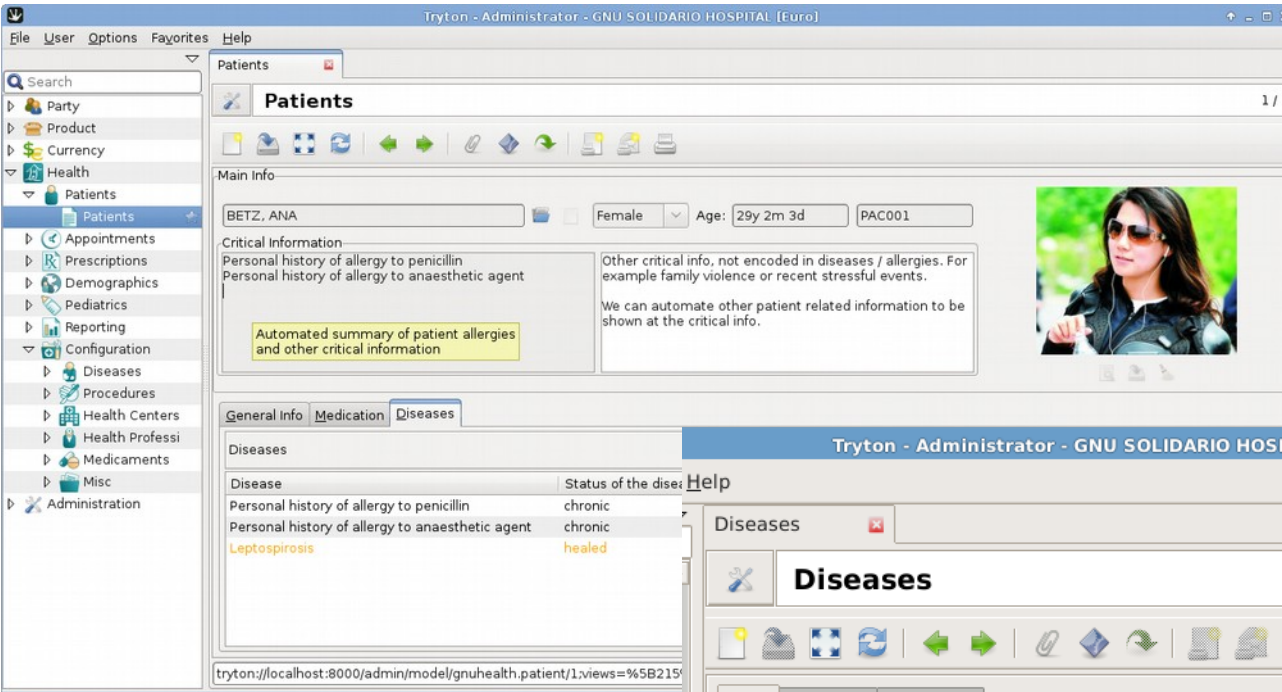


- Preconception and Prenatal Care
- Genetic Risks and counseling
- Obstetric evaluations / imaging
- Nutrition and growth charts
- Socioeconomics
- Neonatology
- Immunizations
- Family Functionality and Affection level
- Psychosocial Risk (Mass General Hospital PSC)

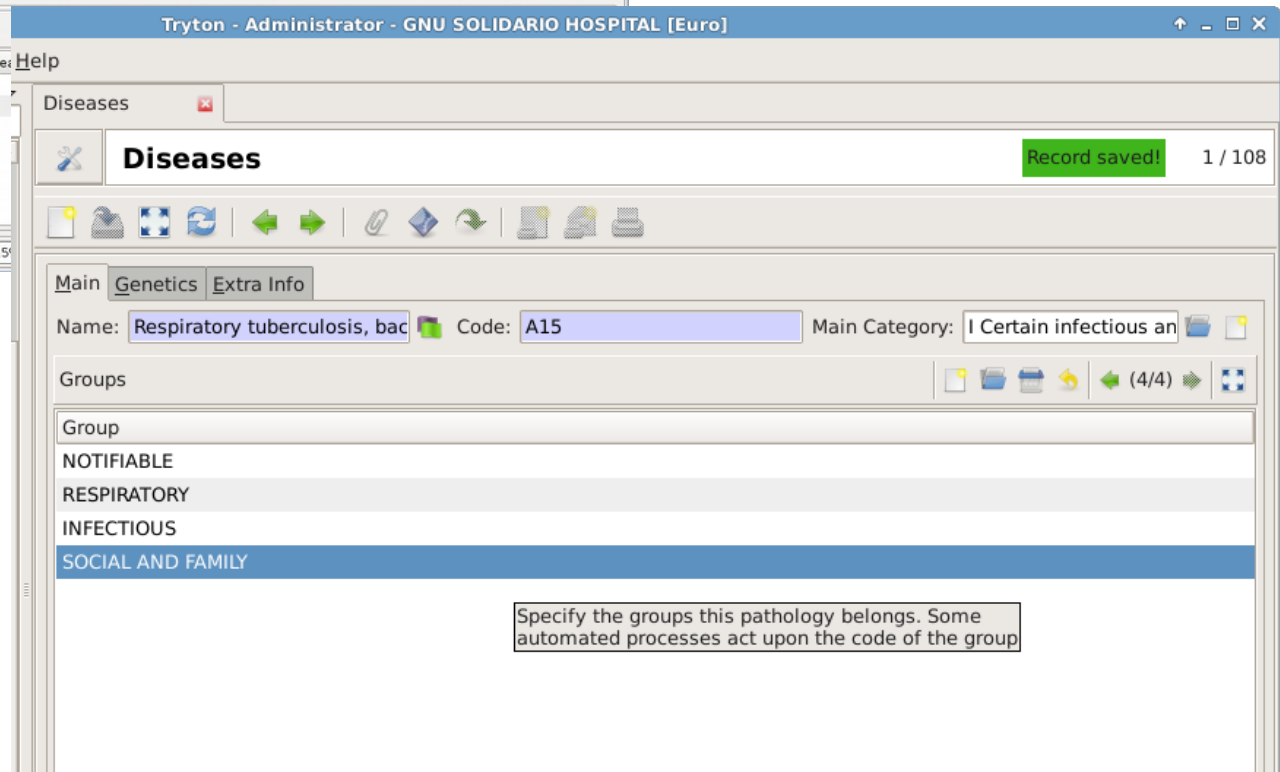
	Name : Matt Mother : Betz, Ana Mother's PUID : 55567890 DoB : 2010-03-15 16:18:09	9876894 
	Male	3600 gr and 52 cm



Disease Groups



Tuberculosis example



Automatic triggers

Patient Critical Info

Reporting



Nature vs Nurture

Tuberculosis : 1/3 of the world infected. Who gets sick ?



"Bernard avait raison. Le germe n'est rien, c'est le terrain qui est tout."

Louis Pasteur

"Epidemia de Injusticia" Dr. José Caminero



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

Pediatric Symptom Checklist 1/1

Patient: **Velasco, Sarah** Date: **08/09/2011 10:30:00** Appointment: PSC Total: **49**

Complains of aches and pains: Sometimes	Spends more time alone: Sometimes
Tires easily, has little energy: Often	Fidgety, unable to sit still: Sometimes
Has trouble with teacher: Often	Less interested in school: Often
Acts as if driven by a motor: Often	Daydreams too much: Sometimes
Distracted easily: Often	Is afraid of new situations: Sometimes
Feels sad, unhappy: Often	Is irritable, angry: Often
Feels hopeless: Often	Has trouble concentrating: Sometimes
Less interested in friends: Sometimes	Fights with other children: Sometimes
Absent from school: Often	School grades dropping: Often
Is down on him or herself: Sometimes	Visits the doctor with doctor finding nothing wrong: Sometimes
Has trouble sleeping: Often	Worries a lot: Often
Wants to be with you more than before: Often	Feels he or she is bad: Sometimes
Takes unnecessary risks: Often	Gets hurt frequently: Sometimes
Seems to be having less fun: Sometimes	Acts younger than children his or her age: Sometimes
Does not listen to rules: Sometimes	Does not show feelings: Often
Does not get people feelings: Sometimes	Teases others: Sometimes
Takes things that do not belong to him or her: Sometimes	Refuses to share: Sometimes

Family APGAR

Help from family: Problems discussion: Decision making:

Time sharing: Family affection: Score:



Name	Code	Category	Toxicity	Dependence	Street names
Heroin	HEROIN	Opioids	Extreme	Extreme	diacetyl-morphine:
Hydrocodone bitartrate	HYDROCODONEBIT	Opioids	High	High	Vicodin: vike, Wats
Inhalants	INHALANTS	Others	Extreme	High	Solvents (paint thin
Ketamine	KETAMINE	Dissociative Anesthetics	Extreme	Low	Ketalar SV: cat Vali
LSD	LSD	Hallucinogens	Low	Low	Lysergic acid dieth
MDMA methylenedioxy-methamphetamine	MDMA	Stimulants	High	Low	Adam, clarity, ecst
Marijuana	MARIJUANA	Cannabinoids	Low	Low	blunt, dope, ganja,

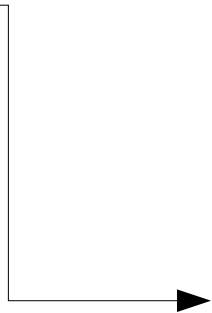
CAGE (1/4)

Date	Hard to Cut	Angry	Guilt	Eye-opene	CAGE Score
02/18/2015	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0
01/13/2015	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1
03/13/2014	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2
01/08/2014	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	4



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)		
....		

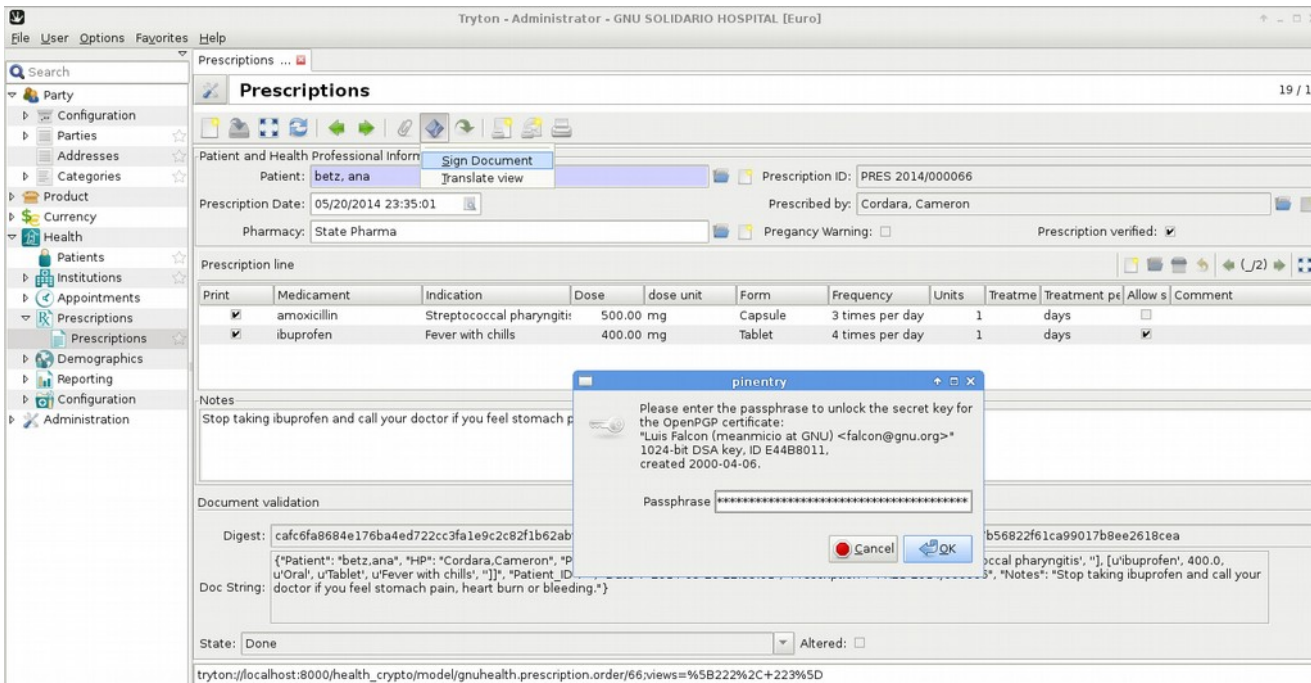
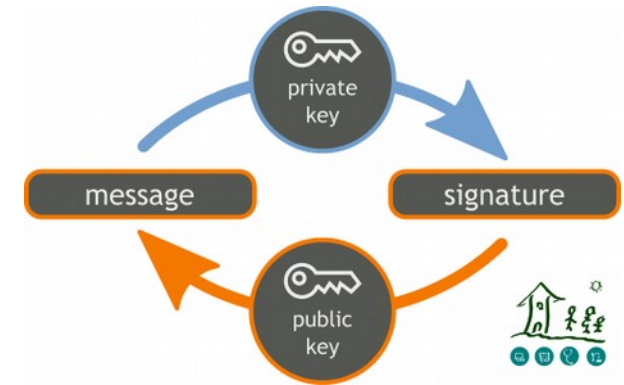


Person ID Card
QR Codes
Wearables



Digital Signatures & ePrescriptions

Digitally sign documents and medical acts
GNU Privacy Guard (GNUPG) Integration
Authenticity, accountability & non-repudiation
Document validation



ePrescriptions

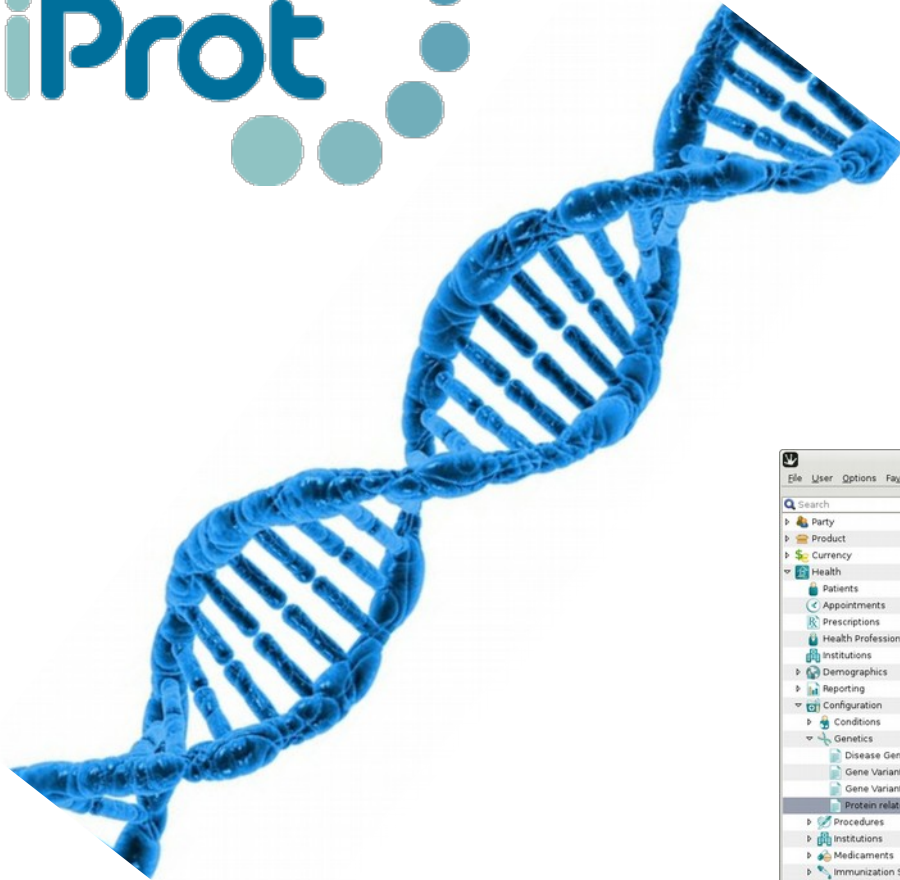
Evaluations / Encounters

Birth and death certificates

Lab Tests, ...



GNU Health :Genetics & Research Institutions



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 the GNU Health software interface. The main window is titled "Protein related diseases" and displays information for the disease "Amyloidosis B" (Disease ID: DI-00104). The interface includes a sidebar with a navigation menu, a search bar, and a table of gene variants. The table lists genes such as APOA1, FGA, and LYZ, along with their specific variants and associated protein names. A description of the disease is also visible, mentioning hereditary generalized amyloidosis and its clinical features.

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.Leu84Arg
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:lysozyme (renal amyloidosis)	LYZ:lysozyme (renal amyloidosis) : VAR_004280 : p.Ile74Thr
LYZ:lysozyme (renal amyloidosis)	LYZ:lysozyme (renal amyloidosis) : VAR_004281 : p.Asp85His



Tools for the Health Authorities



One person, one history : PUID

Tryton - Administrator - GNU SOLIDARIO HOSPITAL [Euro]

File User Options Favorites Help

Search

Party Product Financial Currency Inventory & Stock Purchase Calendar Health

Patients Institutions Appointments Prescriptions Demographics Laboratory Imaging Hospitalizations Surgeries Pediatrics Archives Nursing Health Services Reporting Configuration Administration

People Birth Certifica... 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:

Picture

Code	ID type	Comments
93674665J	Passport	Spanish Passport
PAC001	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.gnusoledario.org:8000/health28/model/party.party/2;domain=%5B%5B%22is_person%22%2C+%22%3D%22%2C+true%5D%5D&views=%5B:

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



Demographics, Epidemiology, Early Warning

Data aggregation

Demographics

People without health coverage

Vital Records System

Outbreak early warning

Geolocalization (OSM)

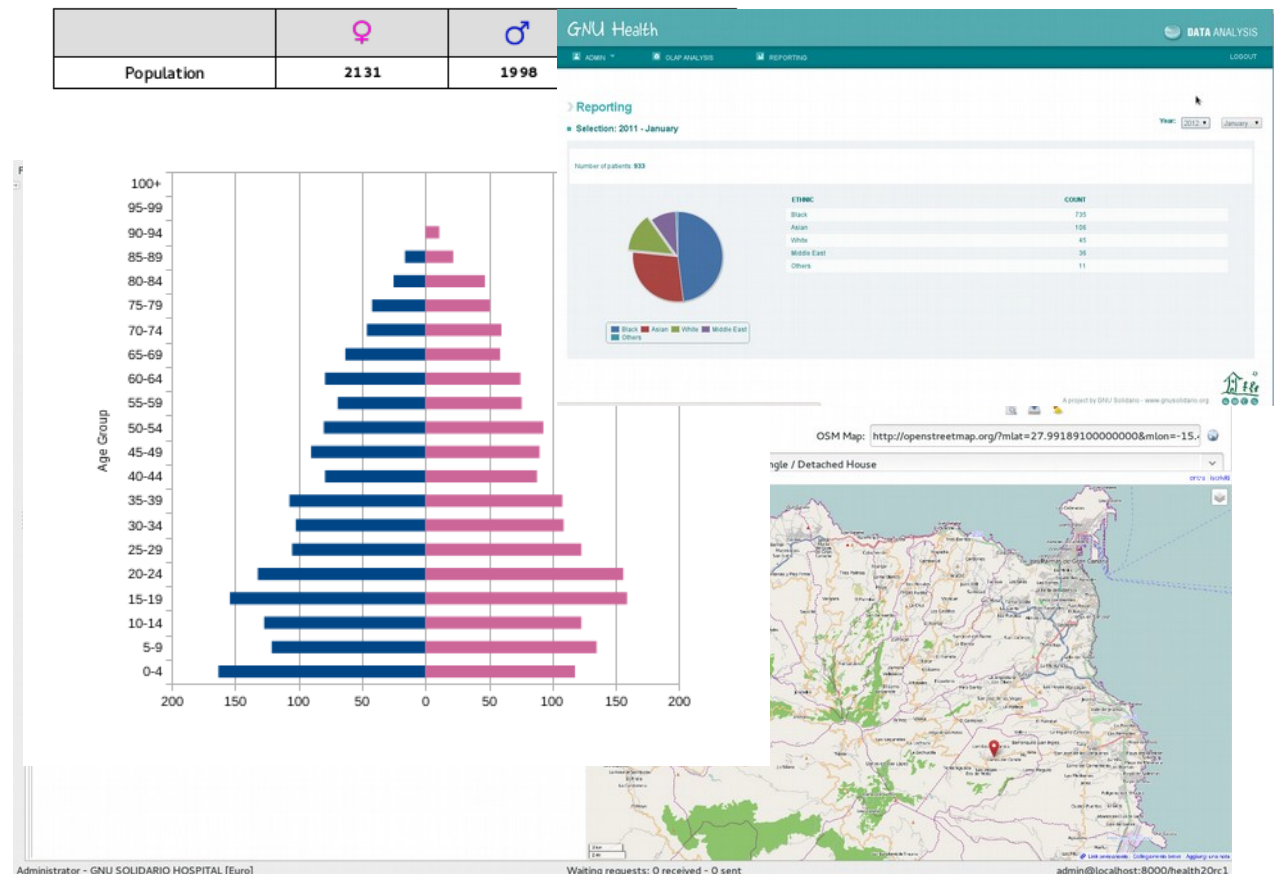
Notifiable diseases

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

GNU Health Summary Report

Population Pyramid

	♀	♂
Population	2131	1998



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: 28.1298400000000 Longitude: -15.4473100000000 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

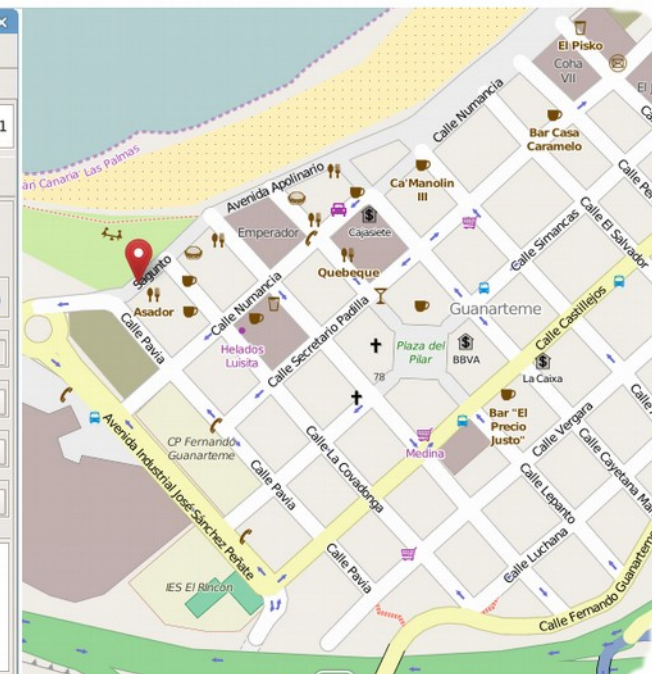
Motor Vehicle Accident
 Mode: Bicycle User Position: Driver Counterpart: Car Safety Gear: Yes

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 Sagunto that were crossing Pavia near the Alfredo Kraus Auditorium. The 29-year old woman was taken by ambulance to Negrin 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 !

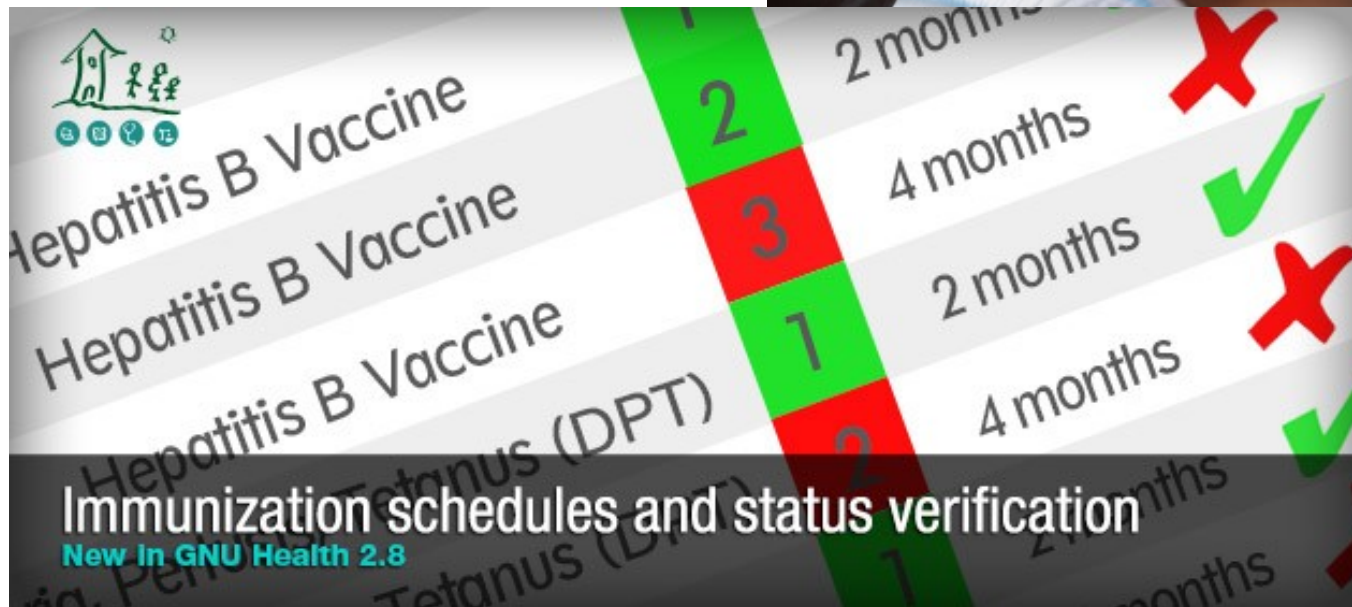


Health Campaigns

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

Immunization status of the population

Risk groups (obesity, diabetes, ...)



VRS : Birth and Death Certificates

Death certifi...

Death certificates

Record saved! 1 / 1

Main
Person: Caput, Bonifacio Date: 01/17/2015 15:00:00 Age: 97y 11m 29d

Place
Place: Health Center Details:
DU: Op. Sector: Las Palmas de Gran Canaria
Institution: GNU SOLIDARIO HOSPITAL
Country: Spain Subdivision: Las Palmas

Cause
Rupture of cardiac wall without haemopericardium as current complication following acute myocardial infarction

Underlying Conditions (1/3)

Condition	Interval	Unit
Acute myocardial infarction		4 days
Intracardiac thrombosis, not elsewhere classified		5 months
Atherosclerotic heart disease		7 years

Other
Type of death: Natural Autopsy: Code: 9472635

Observations

State: Done Signed by: Cordara, Cameron Certified on: 01/18/2015 19:43:39

Document validation
Digital Signature
-----BEGIN PGP SIGNED MESSAGE-----
Hash: SHA1
648966aaaf2c660089d5ca4c132eaded84cb9a230cc0c53dc00070528cee4c01cd69df2b3c5a57f815cbe0cf1b2fd7b30836aefb9da22c4e81eae20e03e7427
-----BEGIN PGP SIGNATURE-----

Original String
{ "Country": "Spain", "HP": "Cordara, Cameron", "Person": "Caput, Bonifacio", "Cod": "Rupture of cardiac wall without haemopericardium as current complication following acute myocardial infarction", "Person_ID": "GHE620VFX", "Place_of_death": "health_center", "Person_dob": "1917-01-19", "Underlying_conditions": "[[u'Acute myocardial infarction', 4, u'days'], [u'Intracardiac thrombosis, not elsewhere classified', 5, u'months'], [u'Atherosclerotic heart disease', 7, u'years']]", "Type_of_death": "natural", "certificate": "9472635", "Country_subdivision": "Las Palmas", "Date": "2015-01-17 15:00:00", "Autopsy": false, "Observations": "" }

Hashes
Digest: 648966aaaf2c660089d5ca4c132eaded84cb9a230cc0c53dc00070528cee4c0 Altered:

tryton://localhost:8000/health28rc1/model/gnuhealth.death_certificate/1/views=%5B644%2C+645%5D



Death certificate document as a digitally signed, legal, administrative, epidemiological document

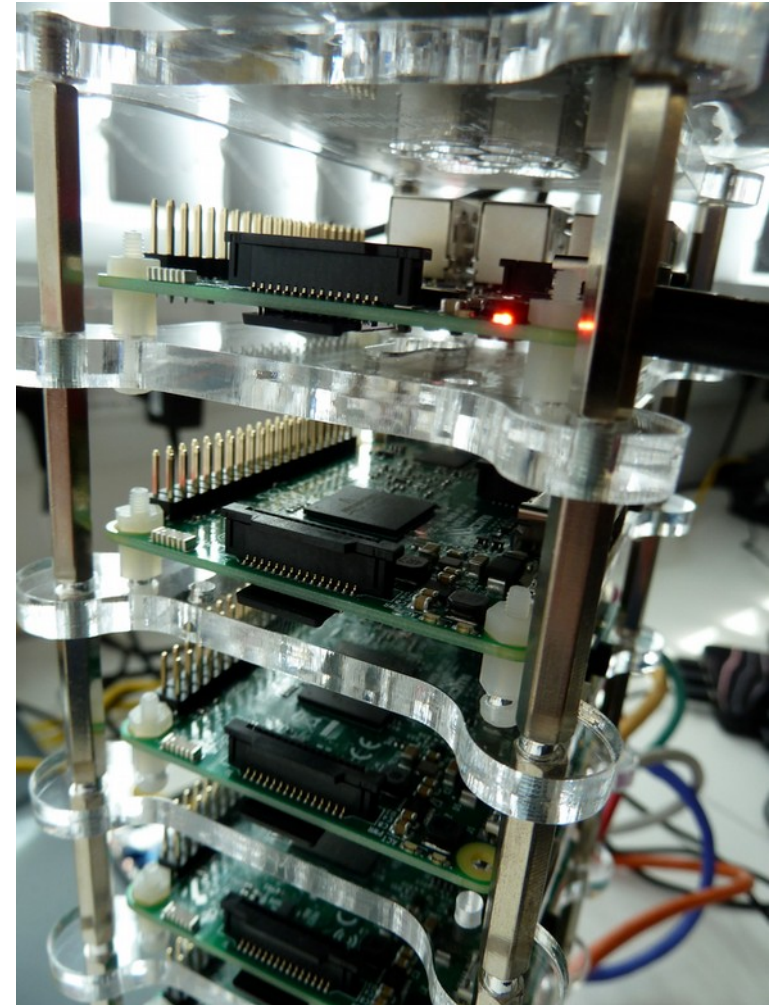
Hardware and Connectivity



Free Hardware



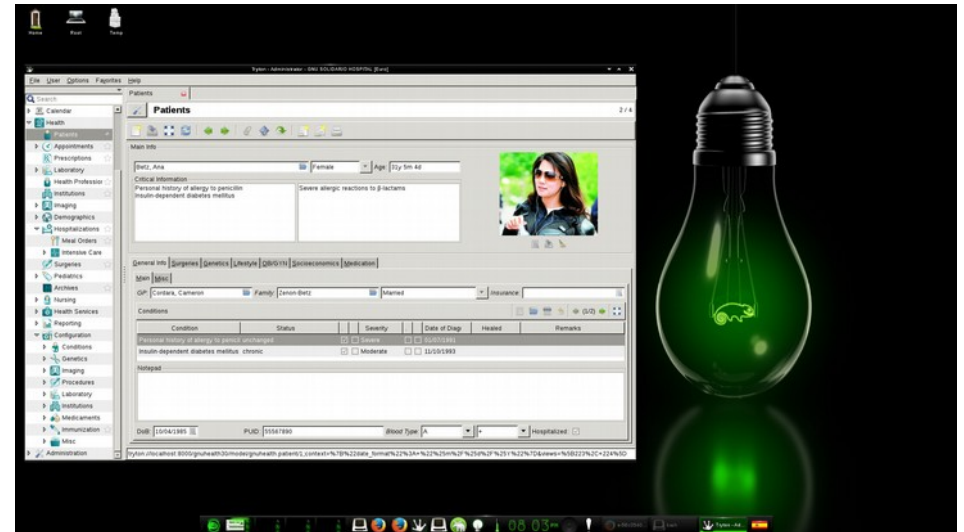
Oxymeter / ECG & Arduino interface (WIP)



The tower of ten Raspberry Pi 3 systems with the 10-port hub
Euan Livingstone / Dr. Tom Kane, Napier University, Scotland



GNU Health & Raspberry Pi



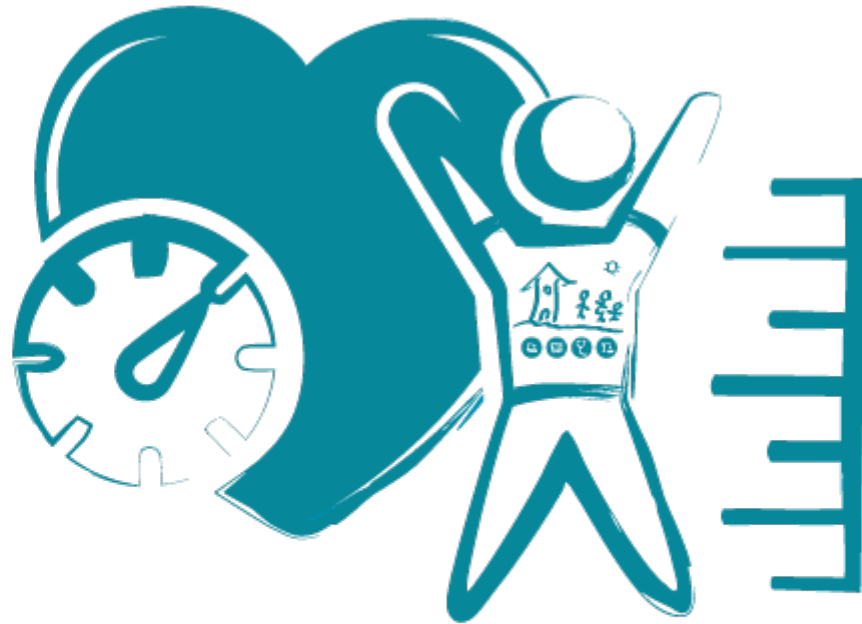
Thanks openSUSE !



GIZ, Bonn
27 Feb 2019

Axel Braun
Gnu Solidario . CC-BY- NC-SA 4.0

My GNU Health



My GNU Health



MyGNUHealth : PHR



Personal Health Record Application

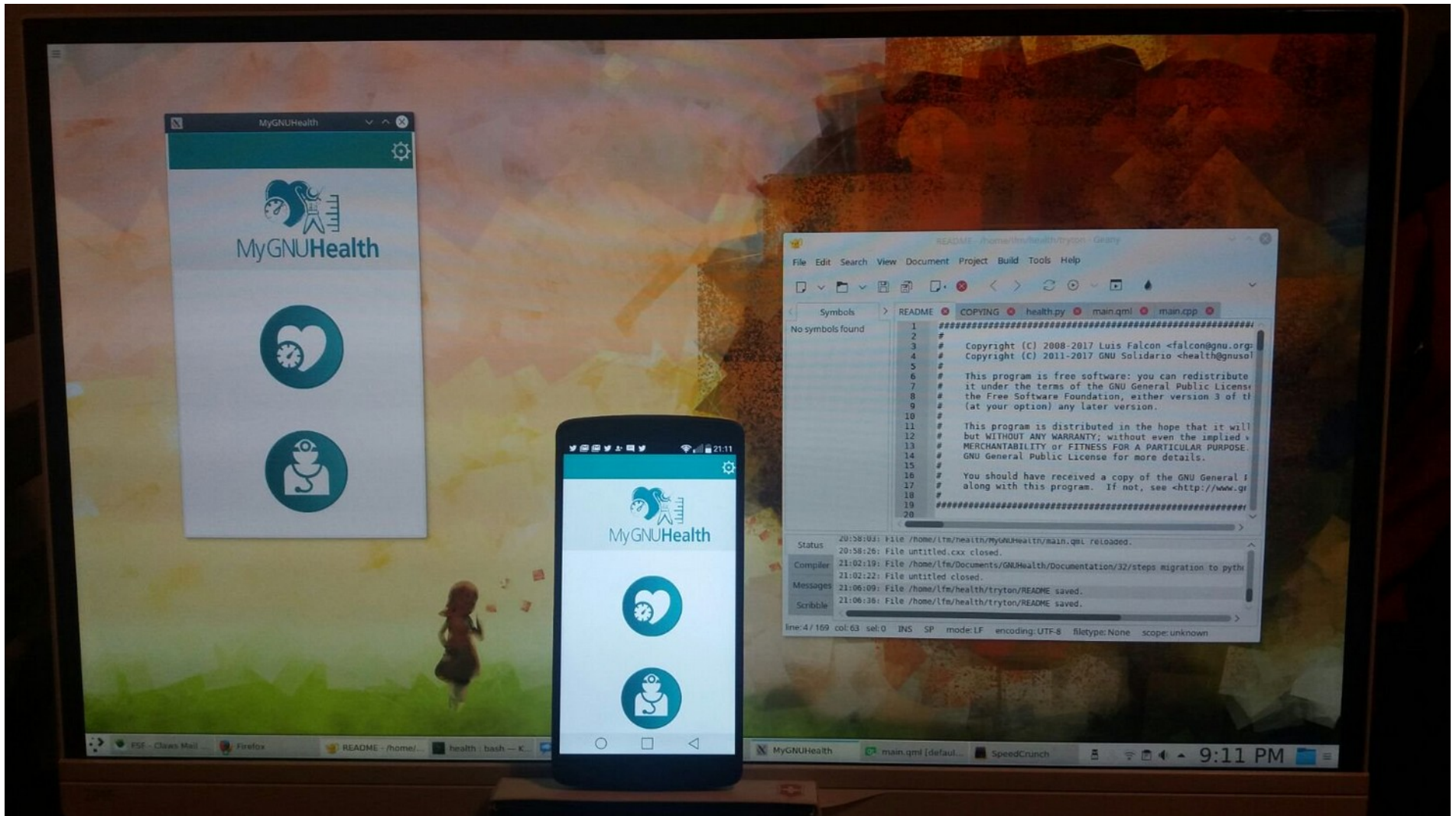
Demographics
Appointments
Telemedicine

BMI
Excercise
Vitals
Blood Glucose levels
Nutrition
Socioeconomics

Health History



Mobile and Desktop application



GNU Health Camera

The screenshot shows the GNU Health software interface. On the left is a navigation tree with categories like Configuration, Parties, People, Addresses, etc. The main window displays a 'People' table with columns for ID, Name, Family names, Patient, Health Prof, and Deceased. A video window titled 'GNU Health Camera' is overlaid on the table, showing a man with a beard and a necklace.

ID	Name	Family names	Patient	Health Prof	Deceased
FOY575UXV	Juana		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FVJ324FPW	Luna		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RRO748BULG	Rainone		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
NV-KBU697CK	unidentified patient		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
55567890	Ana Isabel	Betz	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
GHE620VFX	Bonifacio	Caput	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
CKW3880XX	Roberto	Carlos	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
94023208	Cameron	Cordara	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
NAX507GOW	Wilson	Greg	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
QNU737NT	Carla	Lee	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
COB603VAX	Ignacio Alberto	Pérez Trujillo	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
40556644	John	Zenon	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
97234436	Matt	Zenon Betz	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



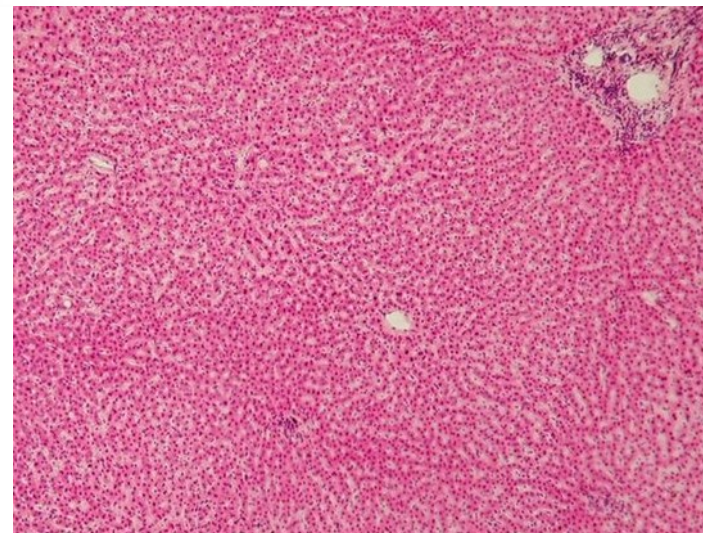
Person / Patient Registration

DUs Surveys

Dx Imaging

Histology / Pathology

...



Community



Role of the Academia



United Nations University, Kuala Lumpur, Malasia

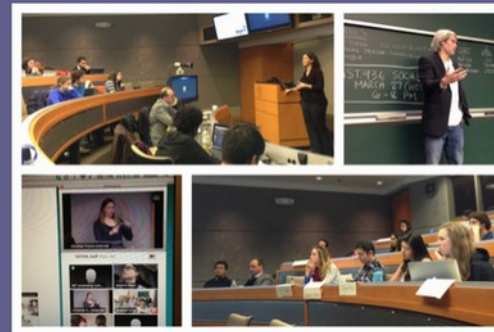


University of Entre Rios, Argentina

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



GIZ, Bonn
27 Feb 2019

GNU Health & WHO



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 the Government of Jamaica



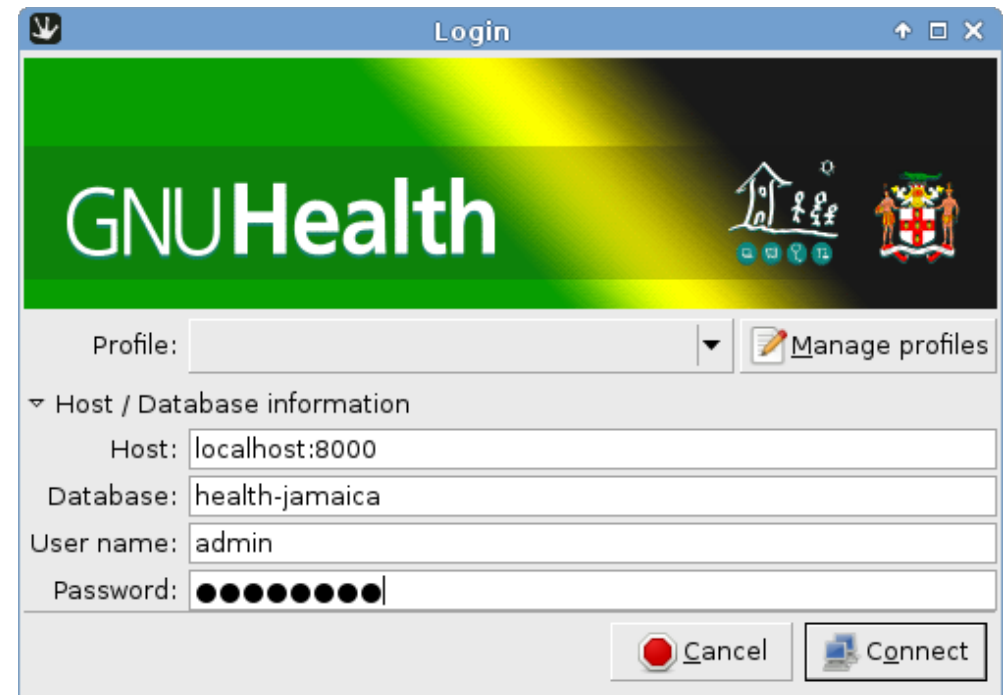
Unique ID for each individual across the country

GNU/Linux on both workstations and servers

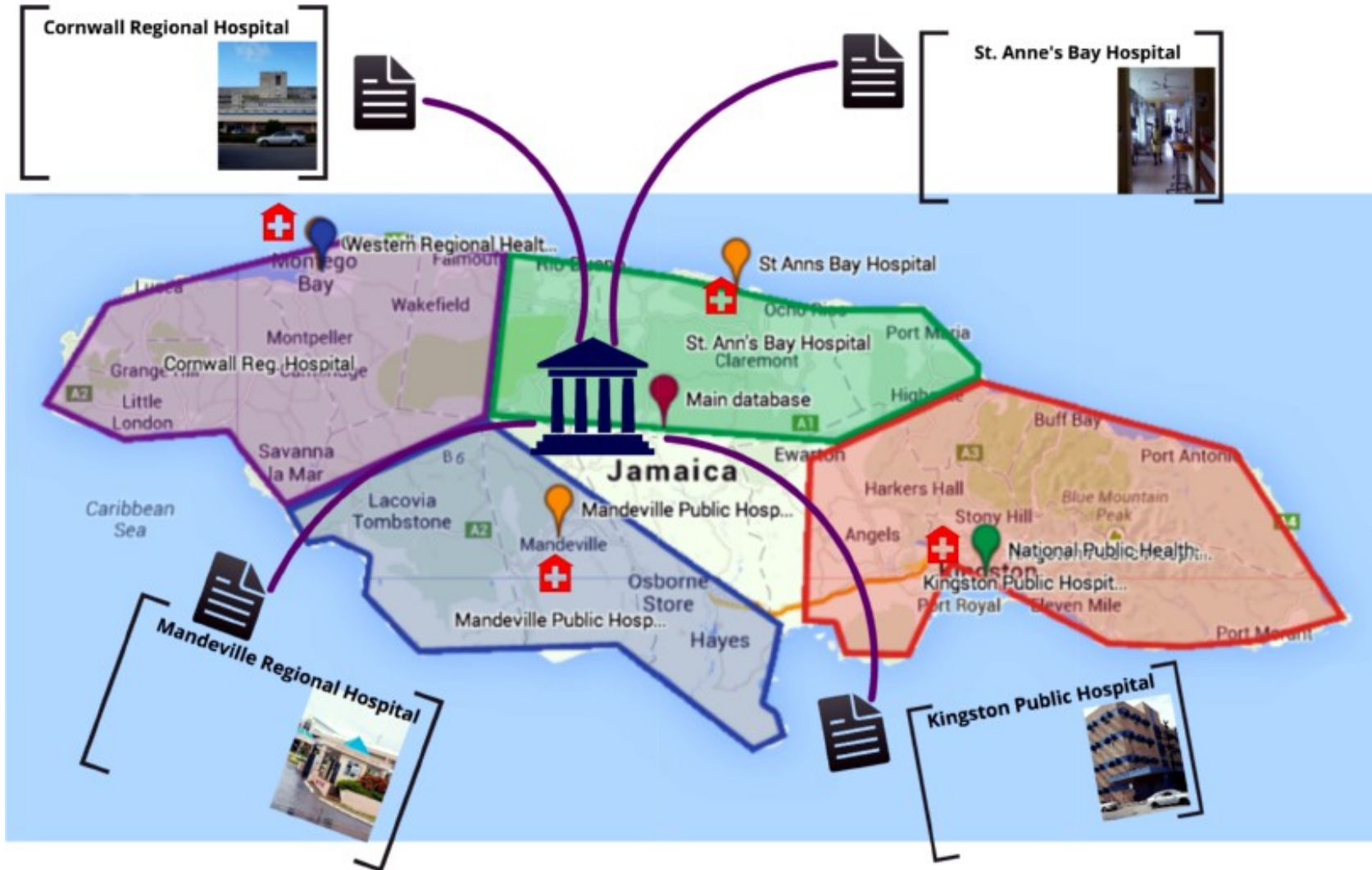
Started as a joint project between Government of Jamaica Ministry of Health and GNU Solidario

Local team

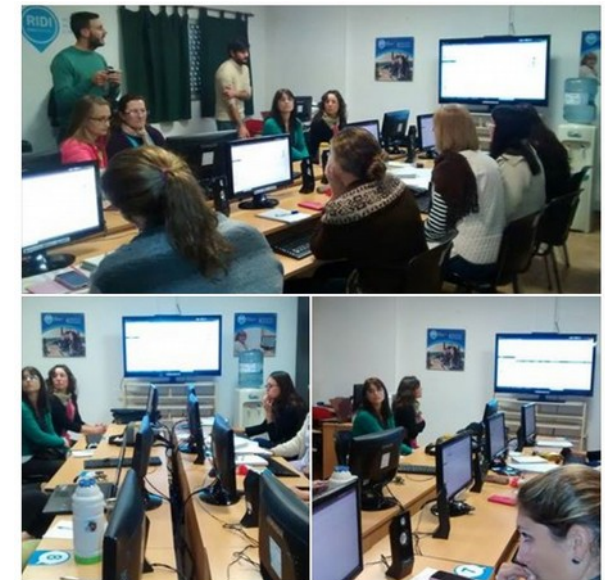
Sustainability and independence



350+ "GNU" Health facilities nation-wide



GNU Health in Argentina



GNU Health at Laos Public Health System



South Africa : Visit to Nelson Mandela Children Hospital



GNU Health in Mexico Morelos Public Health



GIZ, Bonn
27 Feb 2019

People before Profit

From the GNU Health Code of Conduct ...

“GNU Health is, first and foremost, a social project to bring freedom and equity in health care around the World. GNU Health involves much more than just technology. We strive to generate a friendly, welcoming and positive environment around the GNU Health community”.

From the GNU Health Social Contract ...

“Ethical Software Agreement : For GNU Solidario, Ethical Software is a philosophy, that places people before profit, and which main goal is to respect the non-negotiable human right to health care.

This agreement provides an extra level of protection to the Health Center, Health Professional and the population around them. Your organization will never use lock-in policies, such as not releasing part of the code; not providing the upgrade scripts; hiding documentation or any other malicious, ill-intentioned action.”



Rudolf Virchow on Medicine and Politics



Medicine is a social science, and politics is nothing else but medicine on a large scale



See you at GNUHealthCon 2019

A blue banner with a network diagram background. On the left is a logo with a house and people. In the center, the text reads "III International GNU Health Conference - '10 Years of Freedom and Equity in Healthcare'" and "Nov 23-25, Las Palmas, Spain #GNUHealthCon2018". On the right, a large "10" is surrounded by the text "YEARS ANNIVERSARY".

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

GNUHealthCon 2019 – TBA

Las Palmas de Gran Canaria, Spain

www.gnuhealthcon.org

Twitter : @gnuhealth

