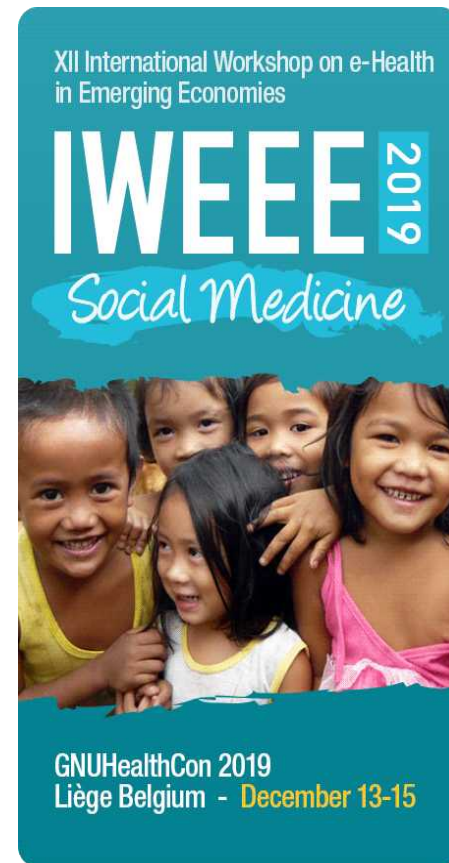


# The Fight for our Rights in Public Health



GNU Health Con 2019  
Liège – Belgium – Dec 13 - 15<sup>th</sup> 2019

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Dr. Luis Falcon, M.D.

# Freedom and Equity in Healthcare

**GNU Health is, first and foremost, a Social Project**



**...with really cool technology**



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# From GNU Solidario



Group pic from **GNUHealthCon 2018** in Canary Islands



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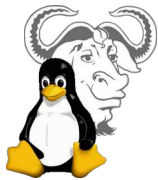
# Official GNU Package

Official GNU Package, from the Free Software Foundation

Open Documentation

Relies on free technology

Friendly community



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# GNU Health Ecosystem

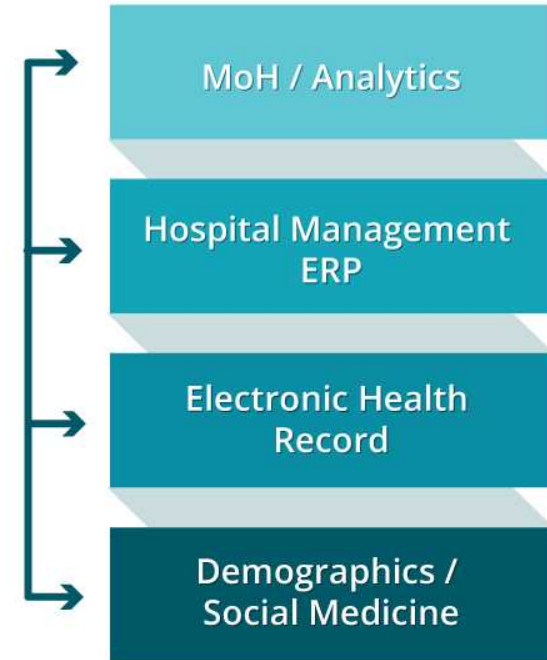


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# GNU Health ecosystem



GNUHealth



# Projects from the GNU Health ecosystem

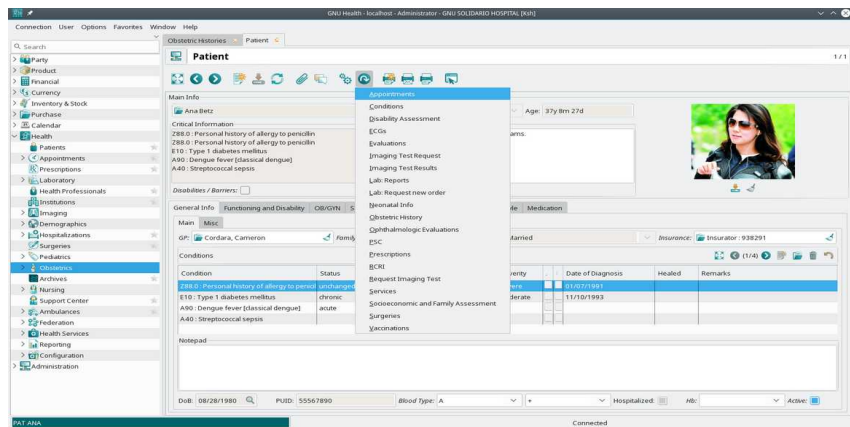


GNU Health Cor  
Liège – Belgium

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# GNU Health snapshots

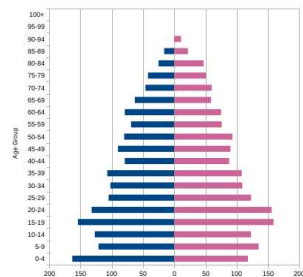
Print Date: 10/11/2014 at 18:57:01



## GNU Health Summary Report

### Population Pyramid

	♀	♂	Σ
Population	2131	1998	4129

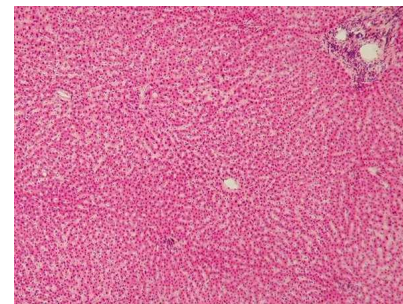
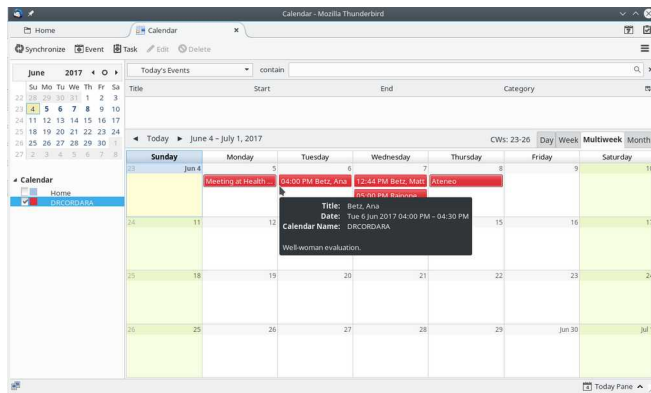
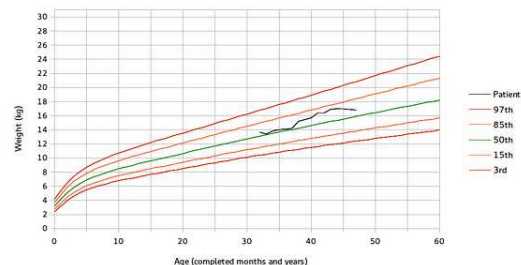


**Name :** Matt  
**Mother :** Betz, Ana  
**Mother's PUID :** 55567890  
**DoB :** 2010-03-15  
**16:18:09**

**9876894**

**Male**

**3600 gr and 52 cm**



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# GNU Health + Orthanc

- Artikel
- Währungen
- Health
  - Books of Life
  - Patients
  - Appointments
  - Prescriptions
  - Health Professionals
  - Institutions
  - Imaging
    - Orthanc
      - Patients
      - Studies
      - Dx Imaging - New
      - Dx Imaging Requests
      - Dx Imaging - Results

**Studies** 5 / 7

Patient: PHENIX Description: CT2 TÊTE, FACE, SINUS

Date: 27.09.2005 Institution: HUG

Referring Physician: CHIR-PED^CHIR-PE ID: 1361

UUID: 49974143-ec23cb52-6b2a1c46-14d5daa0-0822ce1a URL:

Server: Orthanc\_Demo Test:

Orthanc Demo - Patient - Study - Series

Lookups Plugins Upload Query/Retrieve Jobs

Patient: BRANIX  
PatientID: 5796  
PatientSex: 0000

Study: IRM cérébrale, neuro-crâne  
AccessionNumber: 9  
InstitutionName: TCDIFFEC  
ReferringPhysicianName: ANNA TCDIFFEC  
RequestedProcedureDescription: IRM cérébrale, neuro-crâne  
StudyDate: Friday, December 1, 2006  
StudyID: 218211405  
StudyInstanceID: 2.16.840.1.113609.0.0.20.1211.1000

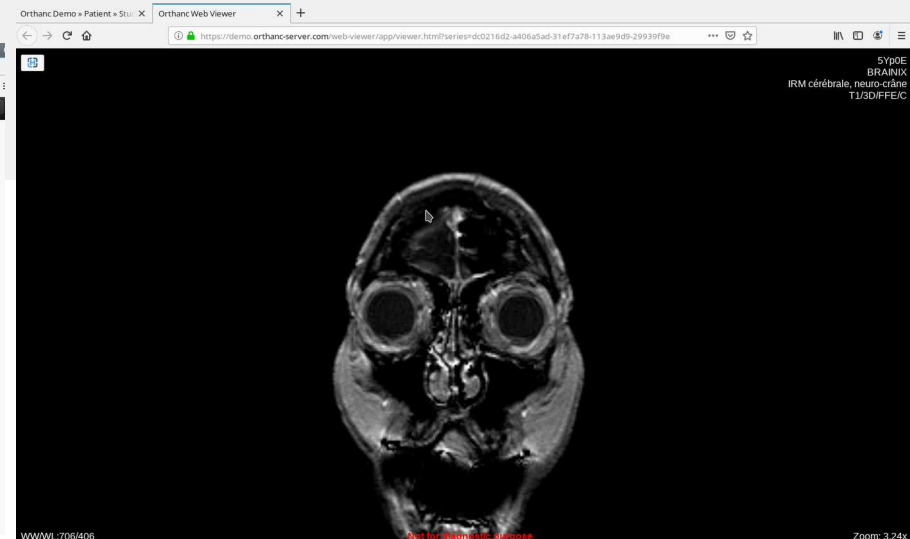
Series: T1DFFE/C  
StudyInstanceID: 2.16.840.1.113609.0.0.20.1211.1000

Send to DICOMweb server  
Transfers accelerator  
Orthanc Web Viewer

Interact

Filter Items...

Instance: 1	SOPInstanceID: 1.3.46.670989.11.0.0.11.4.2.0.8743.5.5396.2006120114483570701	TemporalPositionIdentifier: 1
Instance: 2	SOPInstanceID: 1.3.46.670989.11.0.0.11.4.2.0.8743.5.5396.2006120114483564700	TemporalPositionIdentifier: 1
Instance: 3	SOPInstanceID: 1.3.46.670989.11.0.0.11.4.2.0.8743.5.5396.2006120114483557699	TemporalPositionIdentifier: 1
Instance: 4	SOPInstanceID: 1.3.46.670989.11.0.0.11.4.2.0.8743.5.5396.2006120114483550668	TemporalPositionIdentifier: 1
Instance: 5	SOPInstanceID: 1.3.46.670989.11.0.0.11.4.2.0.8743.5.5396.2006120114483543687	TemporalPositionIdentifier: 1
Instance: 6	SOPInstanceID: 1.3.46.670989.11.0.0.11.4.2.0.8743.5.5396.2006120114483535666	TemporalPositionIdentifier: 1
Instance: 7	SOPInstanceID: 1.3.46.670989.11.0.0.11.4.2.0.8743.5.5396.2006120114483530695	TemporalPositionIdentifier: 1
Instance: 8	SOPInstanceID: 1.3.46.670989.11.0.0.11.4.2.0.8743.5.5396.2006120114483521694	TemporalPositionIdentifier: 1



ORT H ANC



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# We live in a World of Injustice



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# Health is a Fundamental Human Right

**“No one should get sick and die just because they are poor, or because they cannot access the health services they need.”**

World Health Organization

The right to health for all people means that everyone should have access to the health services they need, when and where they need them, without suffering financial hardship.

<https://www.who.int/mediacentre/news/statements/fundamental-human-right/en/>



# Over 20000 Children die every day from Social Diseases



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



Europe



United States



# Victims of War, indifference and hypocrisy



The macabre business of war



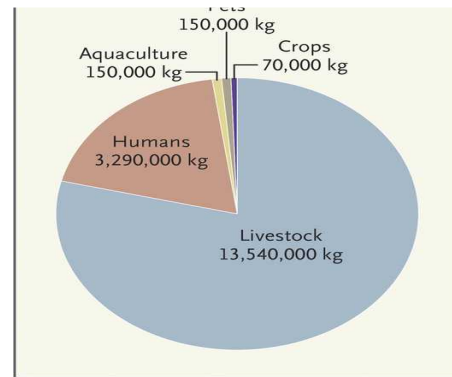


# Ditch Meat & Dairy: For the animals, for your health, for the Planet



**Factory farming accounts for 37% of methane (CH<sub>4</sub>) emissions, 20 times the global warming potential of CO<sub>2</sub>.**

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



New England Journal of Medicine



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# When Healthcare becomes a business, patients become clients



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# Privatization of the Public Health



The rise of private healthcare

Financial institutions as insurance companies

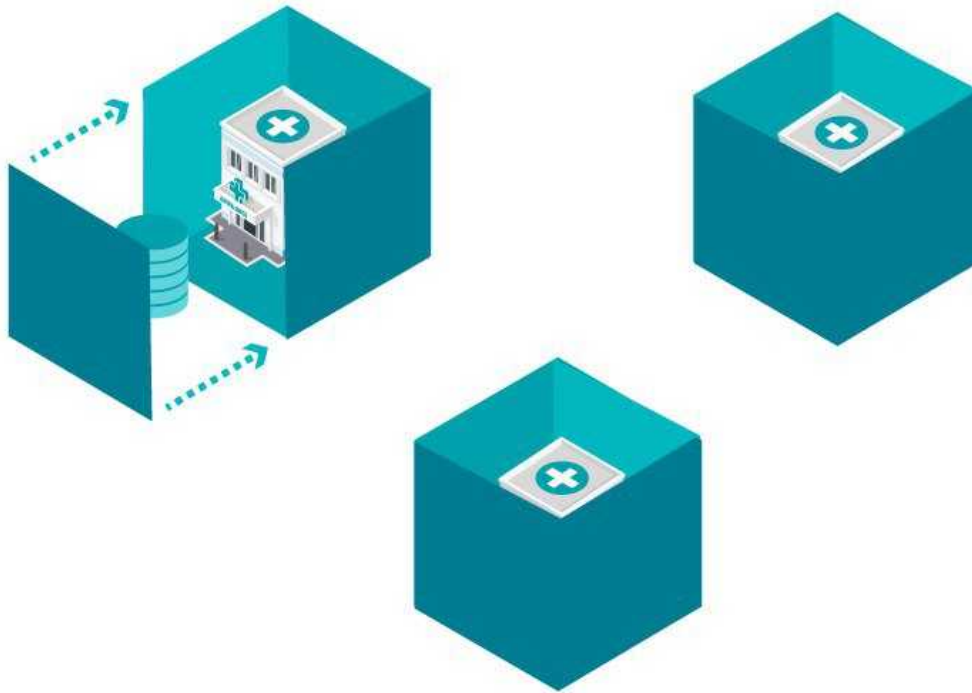
Health becomes a privilege of a few

Sophistication and de-humanization of medicine

The patient becomes a client

Focused on disease and not on health

# Health Information SILOS



The information is locked

Different health histories at each institution, most of them obsolete / not updated

Health professionals and patients can not share medical information

Opposes team work among health professionals and patients

Takes away precious time from the health professional

# Our Mission: Bring back Freedom & Equity in Healthcare



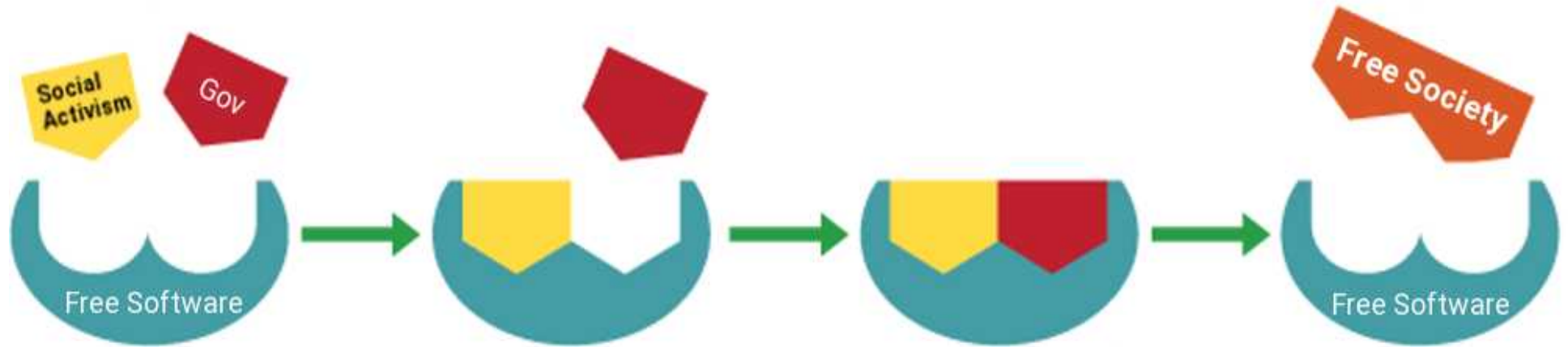
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# Free/Libre Software requires social activism

Free Software as a Catalyst of a Free Society



# The GNU Health Federation

## Collective Freedom



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# GNU Health Federation



**GNUHealth**  
FEDERATION



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# GNU Health Federation

Community based, **community managed**

Based on **collaboration** instead of competition

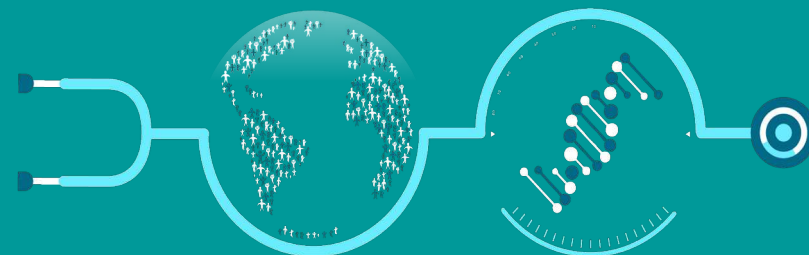
**Independent.** No Lock-ins

Integrates multiple sources and actors

Generates **ethical economic model**

Creates strong local community

**Sustainable** in time



# A proposal to our governments

## Unique ID & history

Person demographics and **medical history up-to-date** no matter the health institution she goes across the country

## Improve quality of care

Health professionals have better and timely patient information. Saving time and providing better healthcare

## Empower the community

The person is now an active player in the system of health



## Public Money, Public Code !

**Libre Software:** No hidden code, no blackboxes in healthcare.

The health software will be a **public good**.

**Save millions of euros** in licenses that can go to improve the public health system.





# GNU Health Federation in Cancer research

GNU Health - admin@localhost/genetics - Administrator - GNU SOLIDARIO HTAL [Euro]

Window Help

Variant Phenotypes

Variant Phenotypes 17 / 40

BRCA1

Gene & Protein	Variant	Phenotype
BRCA1 (P38398):breast cancer 1, early onset	VAR_007778 : p.Thr1025Ile	DI-02602:Breast cancer
BRCA1 (P38398):breast cancer 1, early onset	VAR_007781 : p.Val1047Ala	DI-02602:Breast cancer
BRCA1 (P38398):breast cancer 1, early onset	VAR_007782 : p.Pro1150Ser	DI-02602:Breast cancer
BRCA1 (P38398):breast cancer 1, early onset	VAR_007796 : p.Ala1708Glu	DI-02602:Breast cancer
BRCA1 (P38398):breast cancer 1, early onset	VAR_007799 : p.Met1775Arg	DI-02602:Breast cancer
BRCA1 (P38398):breast cancer 1, early onset	VAR_020679 : p.Glu10Lys	DI-02602:Breast cancer
BRCA1 (P38398):breast cancer 1, early onset	VAR_020680 : p.Glu23Lys	DI-02602:Breast cancer
BRCA1 (P38398):breast cancer 1, early onset	VAR_020683 : p.Asp749Tyr	DI-02602:Breast cancer
BRCA1 (P38398):breast cancer 1, early onset	VAR_020690 : p.Ser1187Ile	DI-02602:Breast cancer
BRCA1 (P38398):breast cancer 1, early onset	VAR_020691 : p.Gln1200His	DI-02602:Breast cancer
BRCA1 (P38398):breast cancer 1, early onset	VAR_020692 : p.Arg1204Ile	DI-02602:Breast cancer
BRCA1 (P38398):breast cancer 1, early onset	VAR_020693 : p.Lys1207Asn	DI-02602:Breast cancer
BRCA1 (P38398):breast cancer 1, early onset	VAR_020695 : p.Ser1217Tyr	DI-02602:Breast cancer
BRCA1 (P38398):breast cancer 1, early onset	VAR_063212 : p.Met1775Lys	DI-02602:Breast cancer
BRCA1 (P38398):breast cancer 1, early onset	VAR_075666 : p.Arg1699Trp	DI-02602:Breast cancer
BRIP1 (Q9BX63):BRCA1 interacting protein C-t	VAR_020896 : p.Pro47Ala	DI-02602:Breast cancer
BRIP1 (Q9BX63):BRCA1 interacting protein C-t	VAR_020900 : p.Met299Ile	DI-02602:Breast cancer
BRCA1 (P38398):breast cancer 1, early onset	VAR_007757 : p.Cys61Gly	DI-01655:Ovarian cancer
BRCA1 (P38398):breast cancer 1, early onset	VAR_020702 : p.Cys1697Arg	DI-01655:Ovarian cancer
BRCA1 (P38398):breast cancer 1, early onset	VAR_075666 : p.Arg1699Trp	DI-01655:Ovarian cancer
BRCA1 (P38398):breast cancer 1, early onset	VAR_020679 : p.Glu10Lys	DI-01559:Breast-ovarian cancer, familial, 1
BRCA1 (P38398):breast cancer 1, early onset	VAR_020680 : p.Glu23Lys	DI-01559:Breast-ovarian cancer, familial, 1
BRCA1 (P38398):breast cancer 1, early onset	VAR_020690 : p.Ser1187Ile	DI-01559:Breast-ovarian cancer, familial, 1
BRCA1 (P38398):breast cancer 1, early onset	VAR_020691 : p.Gln1200His	DI-01559:Breast-ovarian cancer, familial, 1
BRCA1 (P38398):breast cancer 1, early onset	VAR_020695 : p.Ser1217Tyr	DI-01559:Breast-ovarian cancer, familial, 1
BRCA1 (P38398):breast cancer 1, early onset	VAR_020696 : p.Phe1226Leu	DI-01559:Breast-ovarian cancer, familial, 1
BRCA1 (P38398):breast cancer 1, early onset	VAR_020697 : p.Arg1243Gly	DI-01559:Breast-ovarian cancer, familial, 1
BRIP1 (Q9BX63):BRCA1 interacting protein C-t	VAR_023700 : p.Gln255His	DI-01603:Fanconi anemia complementation gr
BRIP1 (Q9BX63):BRCA1 interacting protein C-t	VAR_023702 : p.Ala349Pro	DI-01603:Fanconi anemia complementation gr
BRIP1 (Q9BX63):BRCA1 interacting protein C-t	VAR_023703 : p.Trp647Cys	DI-01603:Fanconi anemia complementation gr
BRIP1 (Q9BX63):BRCA1 interacting protein C-t	VAR_023704 : p.Arg707Cys	DI-01603:Fanconi anemia complementation gr

Connected

VMD 1.8.4s13 OpenGL Display

File Edit View Bookmarks Settings Help

# Contextualized patient information

**Federation Account :** ESPGNU777ORG

**Gene :** BRCA1 (breast cancer 1, early onset)

**Locus :** 17q21

**Protein code :** P38398 . **URI :** <https://www.uniprot.org/uniprot/P38398>

**Natural variant :** VAR\_007757 // **p.Cys61Gly**

**Phenotypes:** DI-02602: **Breast Cancer** . MIM Code : 114480  
DI-01655: **Ovarian Cancer** . MIM Code: 167000

**Onset age :** -

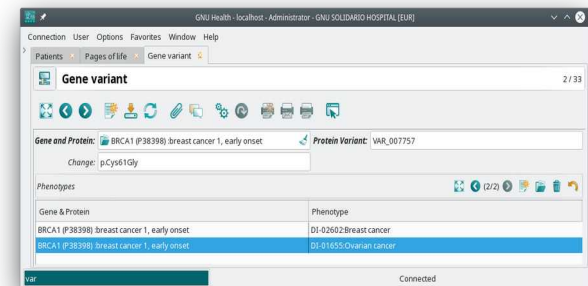
**Family history:** **Mother :** C50.1 Malignant neoplasm central portion of the breast  
**Grandfather (maternal):** Q87.4Marfan Syndrome

**Medical History:** Type 1 Diabetes (7y) / allergic to  $\beta$ -lactams // appendectomy (13y)

**Lifestyle:** Ex-smoker //...

Genetics  
+  
Family history  
+  
Lifestyle  
+  
Socioeconomics

The GNU Health Federation can help finding the answer to many genetic natural variants of unknown clinical significance



# GNU Health Federation Community Hub



Community public server in Munich  
Demo and test environment  
Main Federation components:

- \* HMIS node and PostgreSQL
- \* Thalamus message server
- \* Person / Patient Master Index HIS
- \* openSUSE Leap OS

The GNU Health Federation Community Hub allows developers, health practitioners and research institutions from all over the world to learn, test and develop their nodes & integrate them in the Federated network.



# Some projects around the World



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# From clinics in the African rainforest



<http://health.gnu.org>



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# To the largest hospitals in Asia



# GNU Health and the World Health Organization - WHO



WHO Immunization schedules

Malaria, TB and HIV modules  
Essential list of medicines  
Neglected Tropical Diseases  
ICD-10    ICPM  
Pediatric growth charts



Training sessions with WHO Africa regional officers



GNU Health implementation at Bafia district Hospital, Cameroon with the World Health Organization



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# GNU Health and the World Health Organization - WHO



Adopted by

**UNITED  
NATIONS  
UNIVERSITY**



# Jamaica Public Health System



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

Local team

Sustainability and independence

# Red Cross / Cruz Roja



Cruz Roja Mexicana uses GNU Health, **Over 300,000 evaluations / year**



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# GNU Health at Laos public health



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# GNU Health Alliance of Academic and Research Institutions



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# GNU Health and the Academia



United Nations University, Kuala Lumpur, Malaysia



Univ. Palermo, Italy

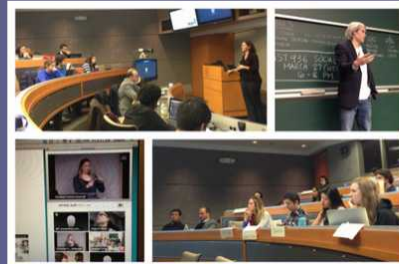


University of Entre Rios, Argentina

## 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



**UNIVERSIDAD DE CIENCIAS MÉDICAS**  
**Matanzas**

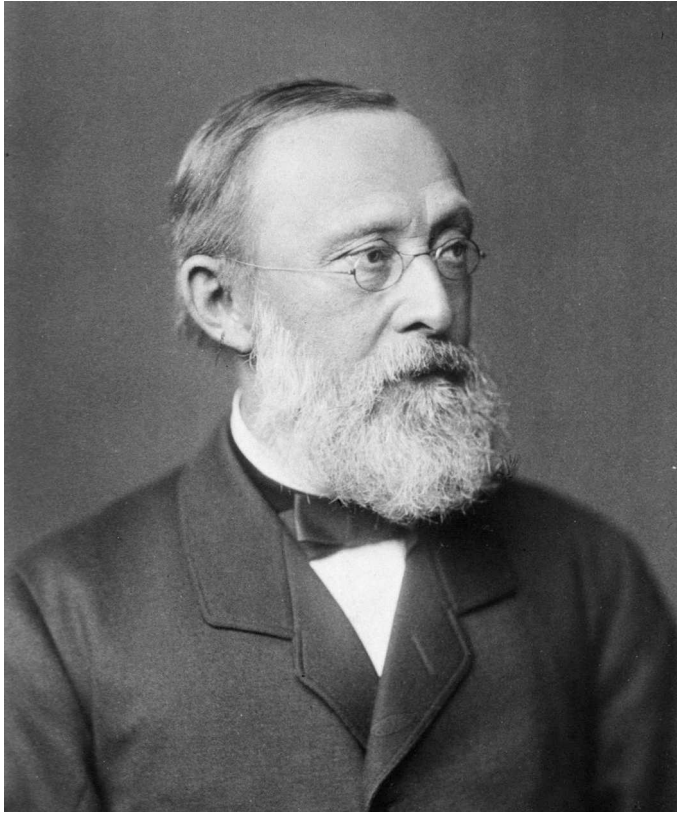
Univ. Matanzas, Cuba



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# Social Medicine



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

***Rudolf Virchow***



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# Join us !



[www.gnuhealth.org](http://www.gnuhealth.org)



[@gnuhealth](https://twitter.com/gnuhealth)



[health@gnusolidario.org](mailto:health@gnusolidario.org)



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# Become a member and win a Raspberry Pi !



[www.gnuhealth.org/join](http://www.gnuhealth.org/join)



**Get a Raspberry Pi  
with GNU Health!**

Become a Member of GNU Solidario  
and get a Raspberry Pi with GNU Health ready to run!  
<https://www.gnuhealth.org/join>

 GNUHealth

 *Become a Member*



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# Health must remain a non-negotiable human right



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