SJD Children’s Hospital Digital and Data Strategy Towards a DDO

Workshop: Building the data-driven hospital and facing the challenges: from EHRs to data ecosystems

Arnau Valls
Innovation Departament, SJD Children’s Hospital
avallse@sjdhospitalbarcelona.org
Hospital Highlights

2020 Activity

21,947
Discharges

272,078 (42.9% homecare)
Outpatient visits

14,472
Surgical operations

3,392
Deliveries

91,243
Emergencies

2020 Resources

2,265
Professionals

302
Beds

2020 Financial Data

€160.9M
Annual Budget

€8.5M
Investments

350,000
Patients/year
First pediatric center in size in Spain and third in Europe

The center with the highest tertiary pediatric activity in Spain
Zygmunt Bauman
(Poznan, 1925 – Leeds, 2017)
Because the world has changed

For the hospital’s survival strategy

Paidhos 2008-2014

PAIDHOS 2020
Liquid Hospital
To go beyond the hospital building

PATERNALISTIC
HOSPITAL CENTRIC
REACTIVE
1 SIZE FITS ALL
SILO’D

PARTICIPATORY
VIRTUAL
REACTIVE
1 SIZE FITS ALL
SILO’D

COLLABORATIVE
PREDICTIVE
PREVENTIVE
PERSONALIZED
Liquid Hospital
To go beyond the walls of the hospital

In Person Contact Points  Digital Contact Points

Actividad presencial  Actividad virtual

<table>
<thead>
<tr>
<th>In-person Contact Points</th>
<th>Digital Contact Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>862 visitas ambulatorio</td>
<td>1.201 Web Sant Joan de Déu</td>
</tr>
<tr>
<td>309 urgencias</td>
<td>2.315 a web Faros</td>
</tr>
<tr>
<td>50 ingresos</td>
<td>3.057 Web Guía Metabólica</td>
</tr>
<tr>
<td>63 intervenciones</td>
<td>118.846 visitas a Facebook</td>
</tr>
<tr>
<td>10 partos</td>
<td>77.337 visitas a Twitter</td>
</tr>
</tbody>
</table>

**1.264 Daily In-hospital Contacts**  **202.756 Daily Virtual Contacts**

Multiplying the impact by 100
Complex **Digital and Data** Ecosystem "SILOS"  

**From...**  
- Web  
- Events  
- Direct mail  
- Email  
- Media  
- Mobile  
- Direct sales  
- Social  
- Merchandising  
- Mailers  
- Offers  
- Ads  
- Actions  
- Engagements  

**To...**  
- Events  
- Web  
- Email  
- Media  
- Direct mail  
- Social  
- Mobile  
- Direct sales  
- **Customer-defined messaging**
Liquid Hospital 4.0
FEDER-RIS3CAT 2015-2019
Objectives “Hospital Liquid 4.0”

1. Model of attention and provision of services that ensures multi-channel:
   - CRM – Contact Center – COACH
   - NEW Patient Portal
   - Health Literacy

2. Create value from the data:
   - Health Data Management (HDM)
Order the data in a single repository from different sources in "silos" to exploit them [Big Data & AI]

“Past”

- Patient
- EHR
- Hospital

“Present/Future”

- Clinical Data: eCAP, Electronic receipt (Rec2t, SIRE), Image Data, LAB
- Bio & OMICS: Genomics, Brain, ‘OMICS
- Monitoring: Medical Devices, Wearables, Internet of Things
- Social Data: Xarxes Socials, Thematic webs / Online communities, Apps, Online Questionnaires
Management Control Healthcare Processes
(KPI, Outcomes, Scores, Operations Control...)

Predictive Analytics
Data Discovery Research
(Rules of clinical support, Data science, DSS)
1.642.967 Data Subjects

11 services

21 data origins (HCE, SAVAC, LAB, ANAT, PAT, DxI,..)

Search response time < 430 ms

Standard HL7

CIE 10 (ICD 10), ORPHA
HL4.0 – HDM
Cloud-based Data Lake

Clinical Decision Support System

Research

Data Analysis and Exploration

360° view of the patient

OBESITY

Prediction of crises (hypoglycemic events)

DIABETES

DIABETES Prediction of crises (
hypoglycemic events)
Telemetry and Command Center for Patient monitoring

The Cardio eCare is a centralized cardiological monitoring center for patients, whether in the hospital or at home, with a physical space dedicated to this task and operated by specialized professionals.
Home Monitoring

PREVENGO. Telemonitoring obese pediatric patients
"Hybrid health": technology (Patient Portal, Fitbit) + Health Coach

PEOPLE

Dra. Marta Ramon
(Responsible Endocrinologia)

Marina Llobet
(Nutritionista)

Mª Jesús Witt
(Nutritionista)

DEVICES

fitbit

GARMIN
Where do we go now?

DATA DRIVEN HEALTHCARE ORG. (DDHO)

Efficiency

[Lower Costs, More Value]
- KPIs
- Surgery queues
- Monitoring of chronic patients
- Scheduling optimization
- Emergency flows

Clinical Practice

Better Health

[Value Based]
- KPIs, PROMs, PREMs
- Decision Support Tools
- Crisis prediction (diabetes,..)
- Rare diseases improvement
- Personalized medicine (genomics, microbiome,..)

Research

Excellence

[Improve Healthcare Delivery: Patient and Professional Experience]
- Benchmarking Pediatric Hospitals and KPIs
- Customer Engagement – Smart Call Center – CRM

 HL4.0
A safe environment in which to carry out clinical research and research with third parties in a structured and standardized way.

Covid Pandemics:
How to accelerate innovation in Healthcare
Entry of Projects and Data to the platform
# The Kids Corona HDM: Open data biobank

Our HDM (Hospital Data Manager) makes the data collected in our COVID-19 research projects available to the scientific community. Any researcher, whether internal or external, can request access to the study data stored in our system and, after security checks, download and use them.

<table>
<thead>
<tr>
<th>6 Datasets</th>
<th><strong>Pediatric, Adult, Pregnant</strong> Dataset populations</th>
<th><strong>17227</strong> Subjects</th>
<th><strong>7267</strong> PCRs</th>
<th><strong>4338</strong> Serological samples</th>
</tr>
</thead>
</table>

[https://kidscorona.irsjd.org/](https://kidscorona.irsjd.org/)
The project consortium, led by Helsinki University Hospital (HUS), is made up of 16 partners from 8 European countries.
Datasets
- Heterogeneous
  - Standards
  - Terminologies
  - Dictionary

Silos
- Many origins
- Data in non-integrated databases

Fear of change
- Cloud Infrastructure
- GDPR
- Policies

Fear of sharing data
- Governance
- Traceability
- Security
- Ethics

Interoperability
- Lack of APIs
- Little homogeneity

Co-existence of Codings Onthologias
- ICD10-2018 / CIE09
- ORPHA
- …

Barriers
Data will transform....

1. **Medicine** (as a Science)
2. **Healthcare** (as an Industry)
3. **Care delivery** (as a Service)

If You Cant Measure It You Can’t Improve It.

Lord Kelvin
Thank you!

Arnau Valls
Innovation Departament
SJD Barcelona Children’s Hospital
avallse@sjdhospitalbarcelona.org