Overview University Hospitals Leuven (UZ Leuven)

• Organisation of hospital care in Belgium

• Organisational Structure

• Strategy
  - Strategic Options
  - Care Programs
  - Quality Improvement Projects
  - Hospital Informations System (HIS)
  - Networking
Belgium

Flemish Region: 6 mio inhabitants
12.211 km²
Dutch speaking

Brussels

Leuven

Belgium: 10.5 mio inhabitants
30.528 km² (~Maryland)
Federated union of Flemish, Brussels and Walloon Region
Organisation of health care in Belgium

- Social security based compulsory health insurance system
- Extensive coverage – increasing amount out-of-pocket
- Broad accessibility to care: abundant offer
- No gatekeeping / echelons: freedom of choice for the patient
- Fee-for-service payment, based on extensive tariff list

=> high patient satisfaction

no waiting lists

percieved good quality

=> low unit cost, high throughput volume
Legislation on health care in Belgium

- **Federal competence**: curative care
  - health insurance system (Bismarck model)
  - legal framework on health care providers (including hospitals)

  defines minimally required (mainly structural) quality standards for hospitals

- **Regional competence**: preventive care
  - creation of a comprehensive social health system (Beveridge model)
  - cofunding for infrastructure of hospitals
  - audit of federal quality standards

  no compulsory accreditation - international accreditation on voluntary basis
  no culture of public reporting of outcome data
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Governance structure UZ Leuven

RvB KUL : Leuven University Board of Directors

BsC UZL : Univ Hosp Board of Directors
Chairman : Guy Mannaerts, MD, PhD
CEO : Marc Decramer, MD, PhD

KUL LRD

DC UZL : Executive Committee
CEO Marc Decramer, MD, PhD
Deputy Vice-Chancellor Wim Robberecht, MD, PhD
UZ Leuven as Academic Medical Center

Driver of quality of care

(top referral) patient care

basic and clinical research

Creator of jobs for highly qualified professionals

(graduate) teaching

Provider of health care professionals

Provider of scientifically based input in organisation of health care
## Education UZL: Undergraduate Students

<table>
<thead>
<tr>
<th>Field</th>
<th>Total number of students</th>
<th>Yearly degrees</th>
<th>% last yr. students in Flanders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medicine</td>
<td>1939</td>
<td>184</td>
<td>51</td>
</tr>
<tr>
<td>Biomed sciences</td>
<td>524</td>
<td>72</td>
<td>60</td>
</tr>
<tr>
<td>Dentistry</td>
<td>230</td>
<td>37</td>
<td>59</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>579</td>
<td>85</td>
<td>41</td>
</tr>
<tr>
<td>Master in nursing</td>
<td>56</td>
<td>39</td>
<td>29</td>
</tr>
<tr>
<td>Physical education</td>
<td>600</td>
<td>130</td>
<td>51</td>
</tr>
<tr>
<td>Physiotherapy</td>
<td>485</td>
<td>71</td>
<td>50</td>
</tr>
<tr>
<td>Logo / Audiology</td>
<td>250</td>
<td>32</td>
<td>39</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>4663</strong></td>
<td><strong>650</strong></td>
<td><strong>45</strong></td>
</tr>
</tbody>
</table>
## Number of beds by site

<table>
<thead>
<tr>
<th>Campus</th>
<th>Number of Beds</th>
<th>Avg daily Census</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gasthuisberg</td>
<td>1479</td>
<td>1131</td>
</tr>
<tr>
<td>Pellenberg</td>
<td>268</td>
<td>162</td>
</tr>
<tr>
<td>St Pieter</td>
<td>56</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>1803</td>
<td>1316</td>
</tr>
</tbody>
</table>
## Hospital staff

<table>
<thead>
<tr>
<th></th>
<th>FTE</th>
<th>People</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Medical staff</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- staff members</td>
<td>507</td>
<td>806</td>
</tr>
<tr>
<td>- residents (in house officers)</td>
<td>665</td>
<td>674</td>
</tr>
<tr>
<td><strong>Other staff</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- patient care</td>
<td>4 394</td>
<td>5 000</td>
</tr>
<tr>
<td>- support</td>
<td>2 176</td>
<td>2 558</td>
</tr>
<tr>
<td><strong>Total staff UZL</strong></td>
<td>7 642</td>
<td>9 038</td>
</tr>
</tbody>
</table>
## Key figures UZ Leuven

<table>
<thead>
<tr>
<th>Service</th>
<th>Figures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Out patients</td>
<td>684.199</td>
</tr>
<tr>
<td>Day care</td>
<td>100.005</td>
</tr>
<tr>
<td>Admissions</td>
<td>56.658</td>
</tr>
<tr>
<td>ER visits</td>
<td>53.816</td>
</tr>
<tr>
<td>Surgical procedures</td>
<td>53.544</td>
</tr>
</tbody>
</table>
## Complexity weighed hospital admissions

<table>
<thead>
<tr>
<th>Pathology</th>
<th>Belgium</th>
<th>UZL</th>
<th>UZL market share</th>
</tr>
</thead>
<tbody>
<tr>
<td>A pathology</td>
<td>1,317,981</td>
<td>44,401</td>
<td>3.37 %</td>
</tr>
<tr>
<td>B pathology</td>
<td>310,603</td>
<td>16,847</td>
<td>5.42 %</td>
</tr>
<tr>
<td>C pathology</td>
<td>16,554</td>
<td>1,811</td>
<td>10.94 %</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1,645,138</td>
<td>63,059</td>
<td>3.83 %</td>
</tr>
</tbody>
</table>
Patient care - Last resort care

- Internal medicine
  - vasculitis, medical ICU (acute on chronic liver failure, weaning problems, ECMO,...),...
- Endocrinology
  - difficult to treat diabetes (including sc pumps, pancreas TX), male sub fertility, ...
- Dermatology
  - therapy resistant ulcer / psoriasis, melanoma, ..
- Oncology
  - stem cell Tx, complicated radiotherapy treatment, ...
- Clinical genetics
  - genetic counseling, diagnosis of onco-hematological diseases, ..
C pathology: APR-DRG labels

- Organ Tx:
  - Heart / lung / liver / kidney / pancreas
  - Stem cell / bone marrow Tx
- Major interventions and/or congenital abnormalities in (low birth weight) neonates
- Severe burns
- Cardiac vascular surgery in patients with important co-morbidity
- Neurosurgical procedures in patients with important co-morbidity
- HIV related infections
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Ageing → increase chronic diseases and multipathology

Challenge: interaction between disciplines (Barnett et al., 2012)
Figure 0.1. **Conceptual framework for health system performance assessment**

- **Health status** (Chapter 1)
- **Non-medical determinants of health** (Chapter 2)
- **Health care system performance**
  - How does the health system perform?
  - What is the level of quality of care and access to services?
  - What does this performance cost?
  - **Quality of care** (Chapter 5)
  - **Access to care** (Chapter 6)
  - **Cost/expenditure** (Chapter 7)
- **Health care resources and activities**
  - **Health workforce** (Chapter 3)
  - **Health care activities** (Chapter 4)
- **Health system design and context** (Annex A)

Source: Adapted from Kelley and Hurst (2006).

Added Value = Quality/Cost
Mission UZ Leuven
Leading European Academic Health Services System

Strategy UZ Leuven

• Integrated approach hospital / university
  Translational Research
• Added value creation
  Innovative care / Quality improvement
  Embedded in the local and regional community
• Networking
  Planning with gp’s, regional hospitals, elderly care units
• Recruitment and retention of human capital
  Top Employer Award
• Organisational efficiency
• International context
• Stimulate clinical research
Added value creation as strategic option

- Continuous improvement of quality and expertise available within UZL:

  Compliance with international standards on hospital wide quality and patient safety
  => re-accreditation by the Joint Commission International (JCI)

  Definition of disease specific standards of quality of care
  => designing care programs within UZL
a. Value creation through innovation in prevention, diagnosis, treatment, rehabilitation and care organisation

b. Strong patient centeredness and focus on equity
## R&D expenses in Europe

<table>
<thead>
<tr>
<th>Land</th>
<th>R&amp;D uitgaven (%BNP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Griekenland</td>
<td>0.69</td>
</tr>
<tr>
<td>Polen</td>
<td>0.90</td>
</tr>
<tr>
<td>Italië</td>
<td>1.27</td>
</tr>
<tr>
<td>Spanje</td>
<td>1.30</td>
</tr>
<tr>
<td>Noorwegen</td>
<td>1.65</td>
</tr>
<tr>
<td>Ierland</td>
<td>1.72</td>
</tr>
<tr>
<td>België</td>
<td>2.24</td>
</tr>
<tr>
<td>Vlaanderen</td>
<td>2.42</td>
</tr>
<tr>
<td>Duitsland</td>
<td>2.92</td>
</tr>
<tr>
<td>Finland</td>
<td>3.55</td>
</tr>
<tr>
<td>EU 28</td>
<td>1.97</td>
</tr>
</tbody>
</table>
Antares rapport, 2014
Investing in innovation

Investering (mio €)

2007-2008
2013-2014

Strategische projecten
Impulsbudget medische diensten
a. Innovation

i. Organisational culture (organic structures, bottom up, entrepreneurial, small units)

ii. Medical departments and CP concept

iii. Pathology-specific outcome indicators, public reporting, bench marking

iv. Valorisation
Care Program centered organisational structure

DC

Medisch inhoudelijke aansturing

ZP Comité

Operationele aansturing

Med. dienst

Med. dienst

Med. dienst

AC

ZP ZP ZP ZP ZP ZP ZP ZP ZP ZP ZP ZP ZP ZP ZP ZP ZP ZP ZP ZP
Broad spectrum of spin-offs
Creating Leverage

Investeringen in spin-offs 2005 - 2012

Euro

<table>
<thead>
<tr>
<th></th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>KU Leuven</td>
<td>7,453,606</td>
</tr>
<tr>
<td>GFF</td>
<td>14,591,843</td>
</tr>
<tr>
<td>derden</td>
<td>631,426,634</td>
</tr>
</tbody>
</table>

631,426,634 Euros were invested in spin-offs from 2005 to 2012.
Clinical studies

- Non-commercial
- CU, MN art.21
- Commercial
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Quality Management: overall aim

- Delivery of high quality care
- Public accountability

"CQI" process
- PDCA cycle
- Improvement

Measurements:
- Internal follow up
- External benchmarking
Department specific ISO and other accreditations

- JACIE accreditation: hematology department
- NETCORN accreditation: hematology department
- EAE accreditation: echocardiology lab
- BFHI - Baby friendly hospital (UNICEF – WHO)
- ISO-Certificate:
  - Medical laboratory
  - Center for molecular diagnostics
  - Laboratory for clinical genetics
  - Pathology
  - Fertility center
  - Nuclear medicine
  - Pharmacy
  - Central sterilisation unit
  - Center for forensic medicine
- ISAE accreditation: IT department
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  - **Hospital Information System (HIS)**
  - Networking
Goals of the Clinical WS

- Access point for the clinician to the HIS
- Replaces the paper communication for Order Entry and Results Reporting
- Integration of medical and administrative data
- Source of data for management info
Overall approach to clinical system

1992

System 9
generator

FormTools
motifTools
tupleTools

X windows
Sybase

System 9 generator

Bart Van den Bosch

All functions for one department

One function for all departments

Departments

Functions

1.

App1

...

AppN

Clinical workstation
Appointment scheduling
Order Entry
Problem list / journal
Medical contacts
Results reporting
Medical messaging system
Registration Physical param.
Medication Prescription

Systems & Tools

System 9 generator

Bart Van den Bosch
Drijfveer: vliegende start nemen, resources of kennis inkopen; later w gebrek aan integratie gevoeld → fases:
1. (nood aan) koppelingen geminimaliseerd;
2. koppelingen opgedreven (aantal, 1- nr 2-wegskoppelingen, frequentie,...)
3. insourcing
Vb. PDMS, Astraia, Mosos, CliniNet (ORL), Chemovorschrift, PACS,....

Dossiers die integratie van een specialisme op nationaal niveau beogen met (ongewild) een desintegratie op ZH niveau. Vb. vereniging van reumatologen, nefrologie dossier, ...

Stijgende vraag naar specifieke ontwikkelingen. Drijfveer = koppelingen met toestellen, speciale registraties,... Vb. Diabetes dossier, reumato, ....

Bart Van den Bosch
Strategic choices

- No best of breed approach
- Holistic system, no separation between
  - inpatient - outpatient
  - nursing - medical
  - specialty files
- Much in house development
  - Generic modules (breadth instead of depth first)
  - Re-use of code as much as possible
  - Pro-actively seeking and migrating to new technology
- Buy ancillary systems only if they can be integrated with the KWS
HIS of the UZ KULeuven

- ADT (Admission-Discharge-Transfer)
- Clinical WS
  - Lab system (external)
- Data Warehouse
- Patient billing
  - (OASIS – XTenso)
- ERP
  - (PeopleSoft & Maximo)
- Lab system
  - (internal)
Use of (proprietary) standards

- HL7 (Mirth as broker)
- XML
- DICOM: PACS for radiology/cardiology
  - Visual light images = jpeg
- ASTM 1394-97 (Lab connections)
- KMEHR: Belgian standard for interaction w government
- XDS: comm. internally on VZN eHealth hub
- TIFF (OCR) + JPEG (full color)
- PDF
3 applications, 3 types of users, 1 DB

EHR DB

- **nexuz CWS Clinic workstations**
  - Employees (care providers)

- **mynexuz**
  - Patients

- **myUZ**
  - referrers

- **mynexuz pro LISA**
  - Care providers

- **ehBox**

---

**Keywords:**
- EHR DB
- 3 applications
- 3 types of users
- 1 DB
- nexuz CWS Clinic workstations
- Employees (care providers)
- mynexuz
- Patients
- myUZ
- referrers
- mynexuz pro LISA
- Care providers
- ehBox
nexuz health service points

7,596 beds total (25.6% of Flemish hospital beds; and growing)
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Networking

Flemish Hospital Network KU Leuven

Locoregional care partners

Multicenter Electronic Patient Record
Proportion foreign physicians 2011-2014

Senior ASO:
- Belgische nationaliteit: 63%
- Andere nationaliteit: 37%

VMS:
- Belgische nationaliteit: 74%
- Andere nationaliteit: 26%