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# Outcome results from real-life treatment practice for colorectal cancer in Belgium and some European countries

*OECI Oncology days*



[www.kankerregister.org](http://www.kankerregister.org) | [www.registreducancer.org](http://www.registreducancer.org)

Drs Dominique de Valeriola  
& Elisabeth Van Eycken  
Poznan, 20/06/2018

- ◆ Replacement of Dr Elisabeth Van Eycken
  - *Medical Director of the Belgian Cancer Registry*
  
- ◆ Dr Dominique de Valeriola
  - *General Medical Director, Institut Jules Bordet, Brussels &*
  - *Vice-President, Belgian Cancer Registry*

# Overview

- ◆ Background
- ◆ Cancer Registries
- ◆ Hospital based registries, Cancer Centres
- ◆ Outcome research and Quality of care in oncology
  - Belgium: Integrative quality system, examples
  - European collaborations
- ◆ Future and conclusion

# Background

- ◆ **Cancer Registries**
  - Population based
  - Used to collect, link and merge data, analyse data
- ◆ **Clinical registries**
  - Hospital based, sometimes 'organ' or 'system' specific
  - Clinically relevant data present
- ◆ Complimentary types of databasis, source of common projects
- ◆ How to set up a **partnership** for cancer outcome research between Hospital Registries and Cancer Registries?

# Possible Data Sources for Cancer Registries?

## Medical Files

- ◆ Oncology and radiotherapy departments (hospitals)
- ◆ Pathology and Haematology, Autopsy
- ◆ Clinical Biology, Genetics, Imaging departments
- ◆ Palliative Care services
- ◆ General practitioner
- ◆ ...

## Administrative data bases

- ◆ Health Insurance data (medical claims data, pharma)
- ◆ Hospital discharge data
- ◆ National registries: Demographic, Socio-economic, vital status
- ◆ Death certificates
- ◆ ...

**Hospital clinical data bases: CANCER CENTRES!**

# Cancer Registries: Quality pillars?

- ◆ 4 pillars to evaluate quality in Cancer Registries
  - **Completeness:** all cases, complete dataset for each case, continuous
  - Data **validity:** accuracy, precision, ...
  - **Comparability:** coding practices, health care system, standardisation...
  - **Timeliness:** as close as possible to real time, delay of collection

# Clinical registries - Cancer Centres

## ◆ Medical files

- Clinically relevant, specific and detailed data available
- Mostly text, not often structured data easy to extract

## ◆ Registration efforts needed to structure and classify data

- Missing data
- Internal and external validity of data

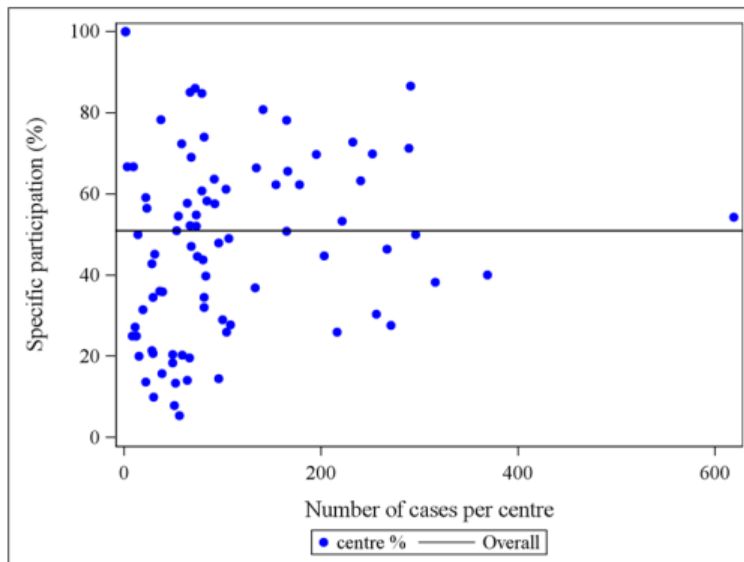
## ◆ Hospital based

- Selection bias: specific Case mix of a cancer centre
- Take into account (sometimes) small volumes

# Clinical registries based multidisciplinary project:

## Selection bias when voluntary participation

Rectal cancer project: % of patients in the study compared to the total number of rectal cancer patients per Centre, 2006-11



**PRO CARE**

PROJECT ON CANCER OF THE RECTUM

=> No conclusions!



Completeness and registration bias in PROCARE, a Belgian multidisciplinary project on cancer of the rectum with participation on a voluntary basis

D. Jegou<sup>a</sup>, F. Penninckx<sup>b</sup>, T. Vandendael<sup>a</sup>, C. Bertrand<sup>a</sup>, E. Van Eycken<sup>a,c</sup>, on behalf of PROCARE<sup>1</sup>



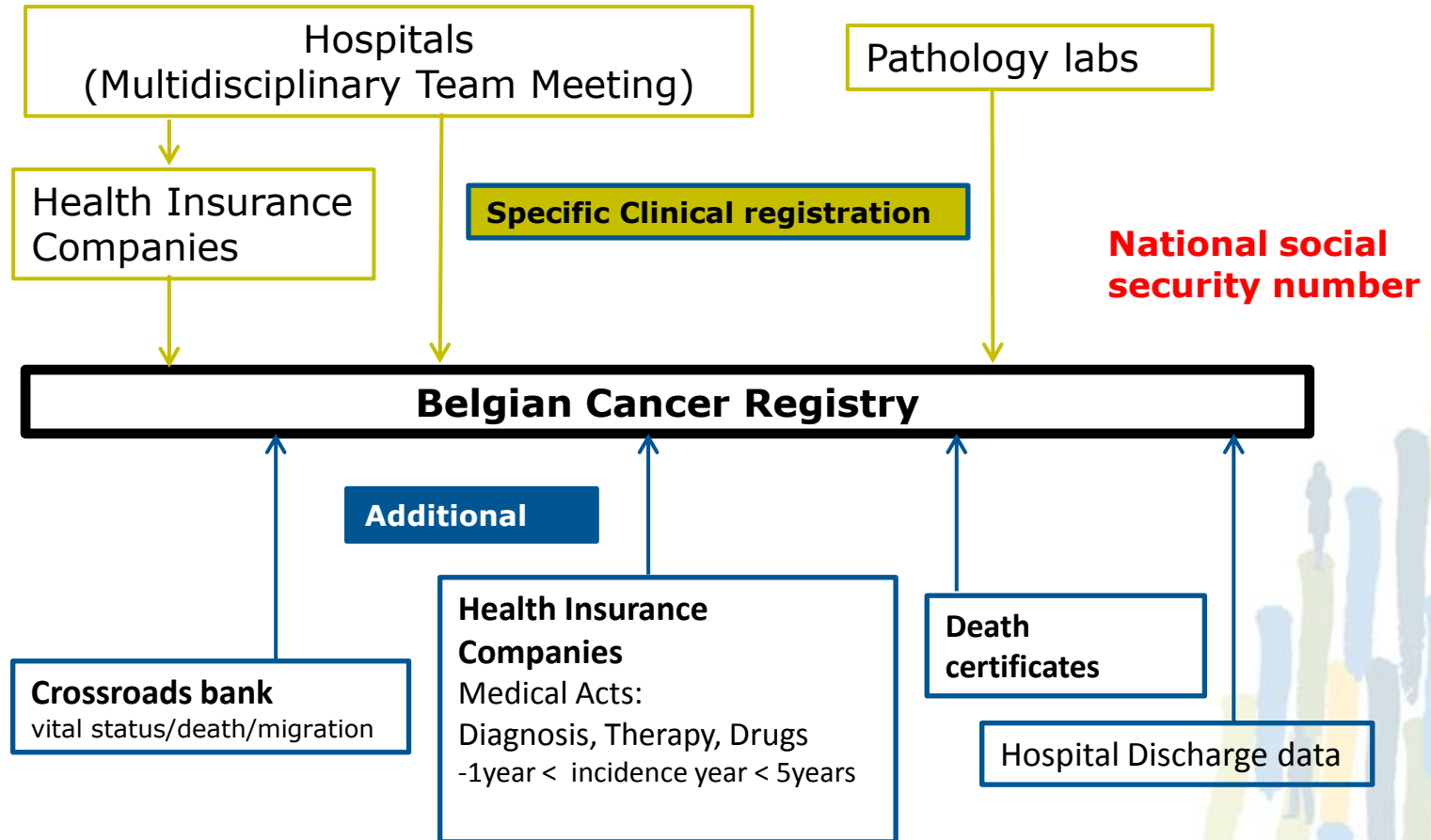
# Outcome research and Quality of care in oncology: Population based

Belgian Cancer Registry



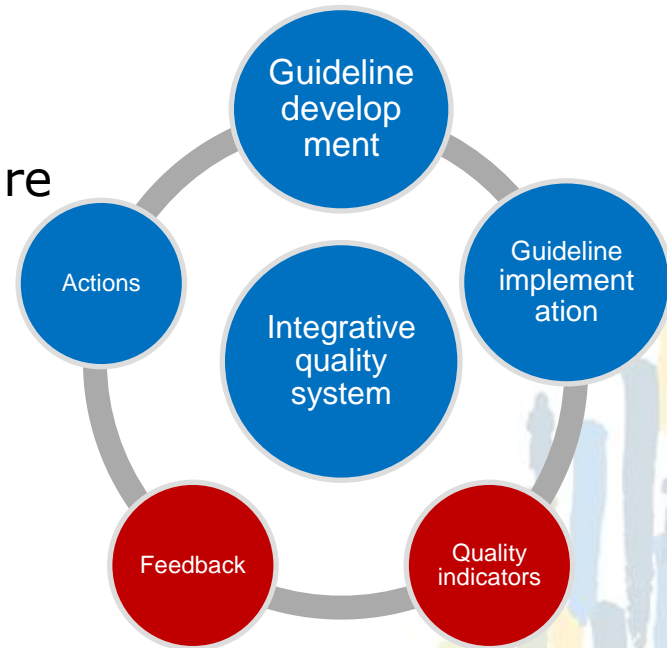
[www.kankerregister.org](http://www.kankerregister.org) | [www.registreducancer.org](http://www.registreducancer.org)

# Belgian Cancer Registry: Data sources?



# Feedback from the Belgian Cancer Registry to the hospitals: The integrative quality system loop

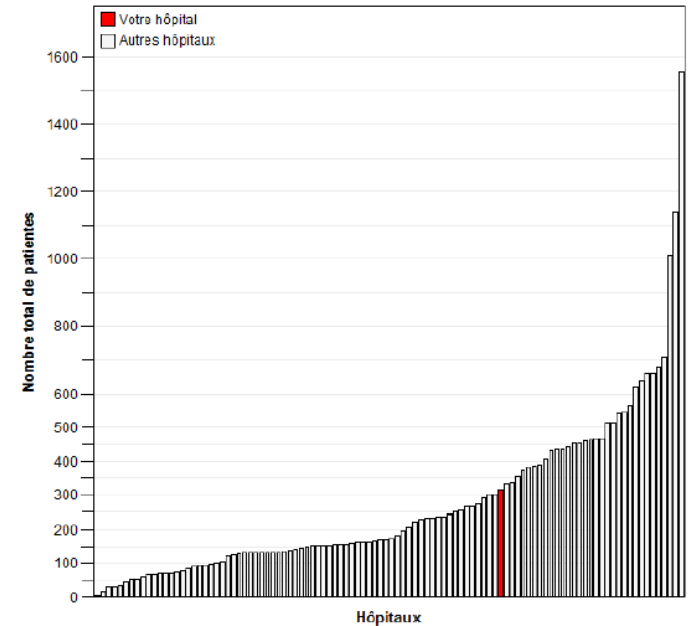
- Involves clinicians
- Improves quality of care
- Improves organisation of healthcare
- Improves quality of registration



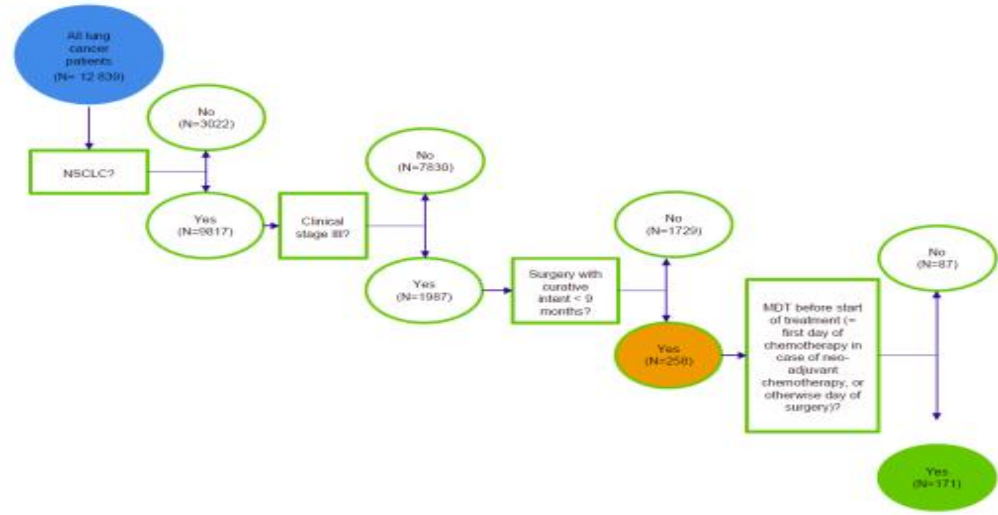
**Report 152: Quality indicators in oncology: prerequisites for the set-up of a quality system, Belgian Health Care Knowledge Centre**

# Quality of care study - How?

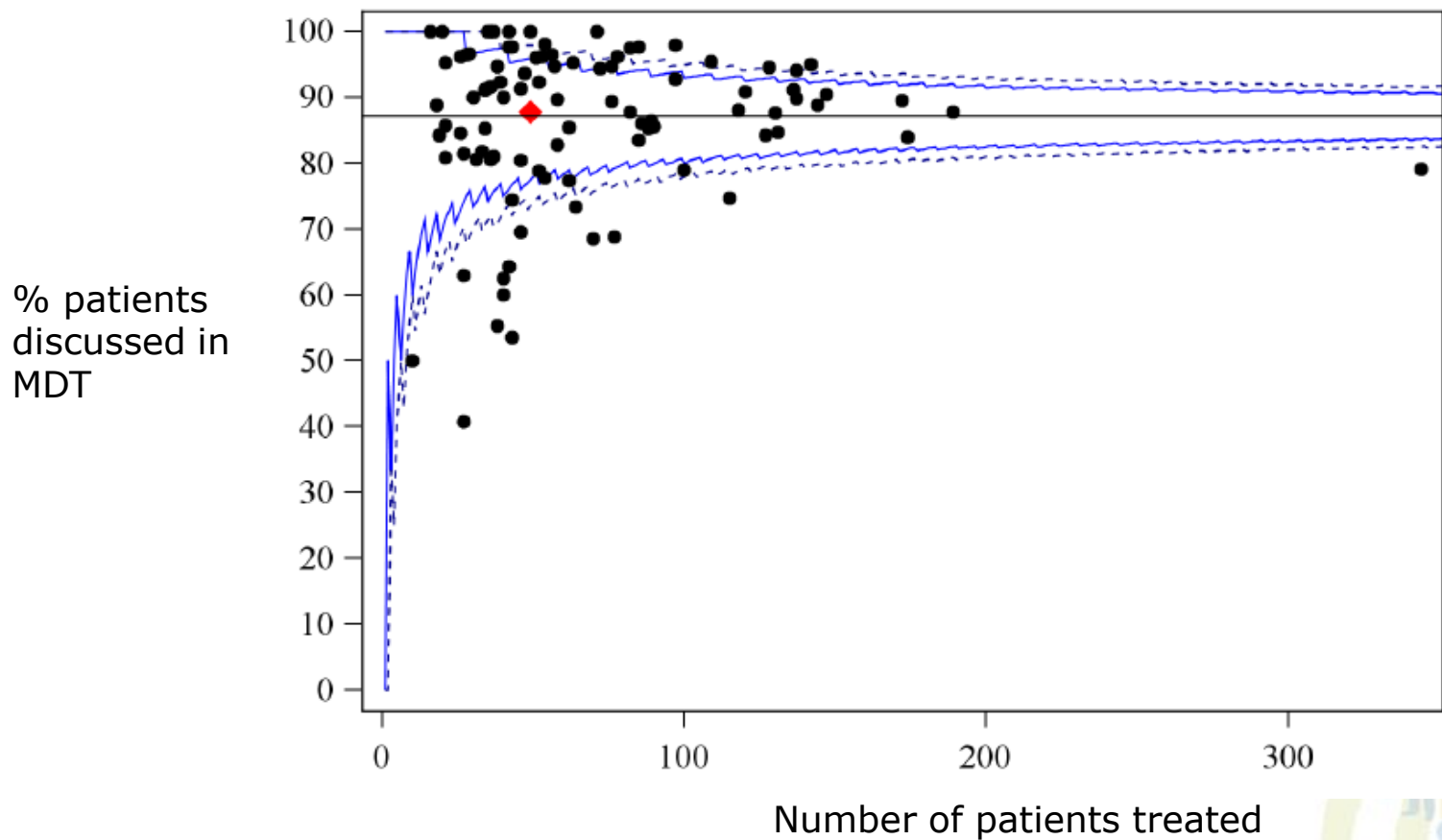
- **Assignment**
  - Patient > a centre
- **Indicators choice**
- **Flow charts**
  - Nominator - Denominator
- **Validation of data?**
  - All or some centres
- **Targets?**



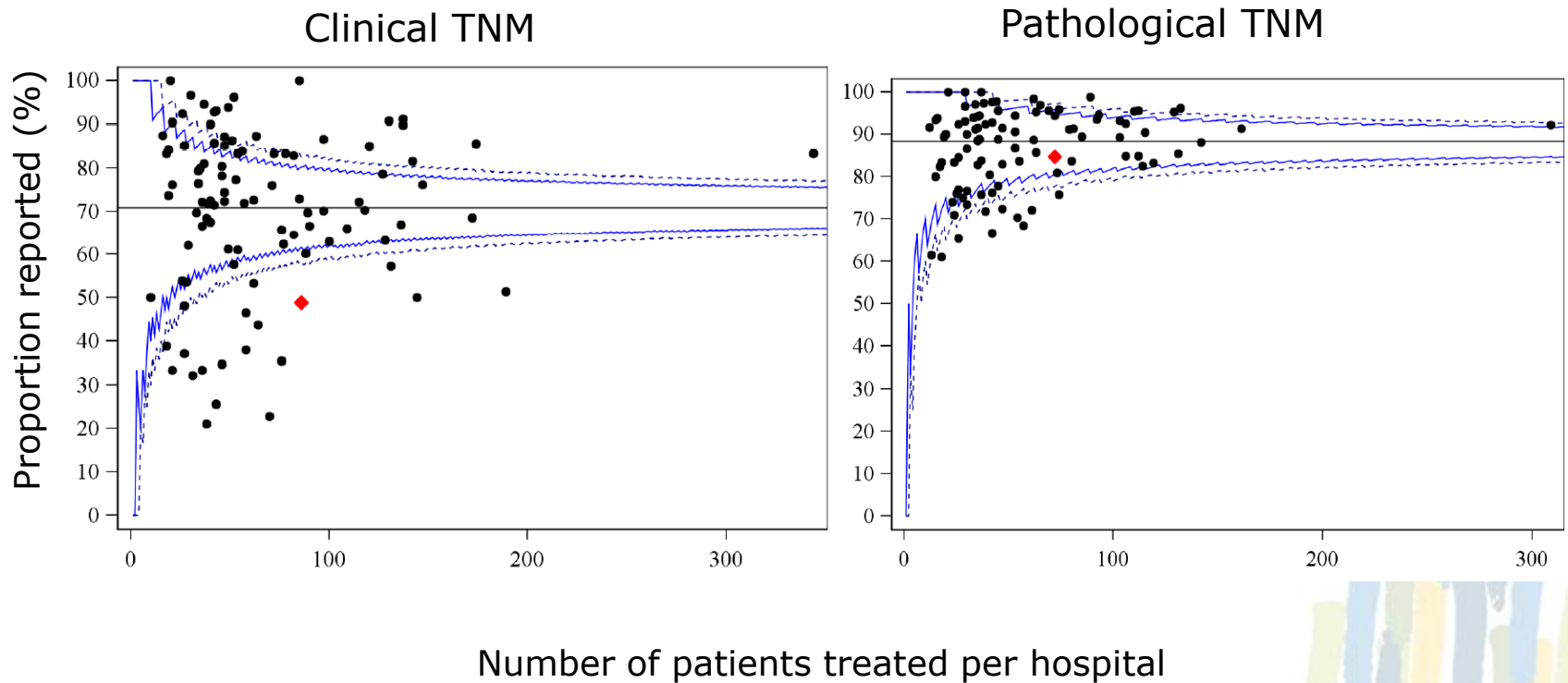
3.11.2 Flowchart



## Rectal cancer, 2009-2011, % patients discussed in MDT, per hospital



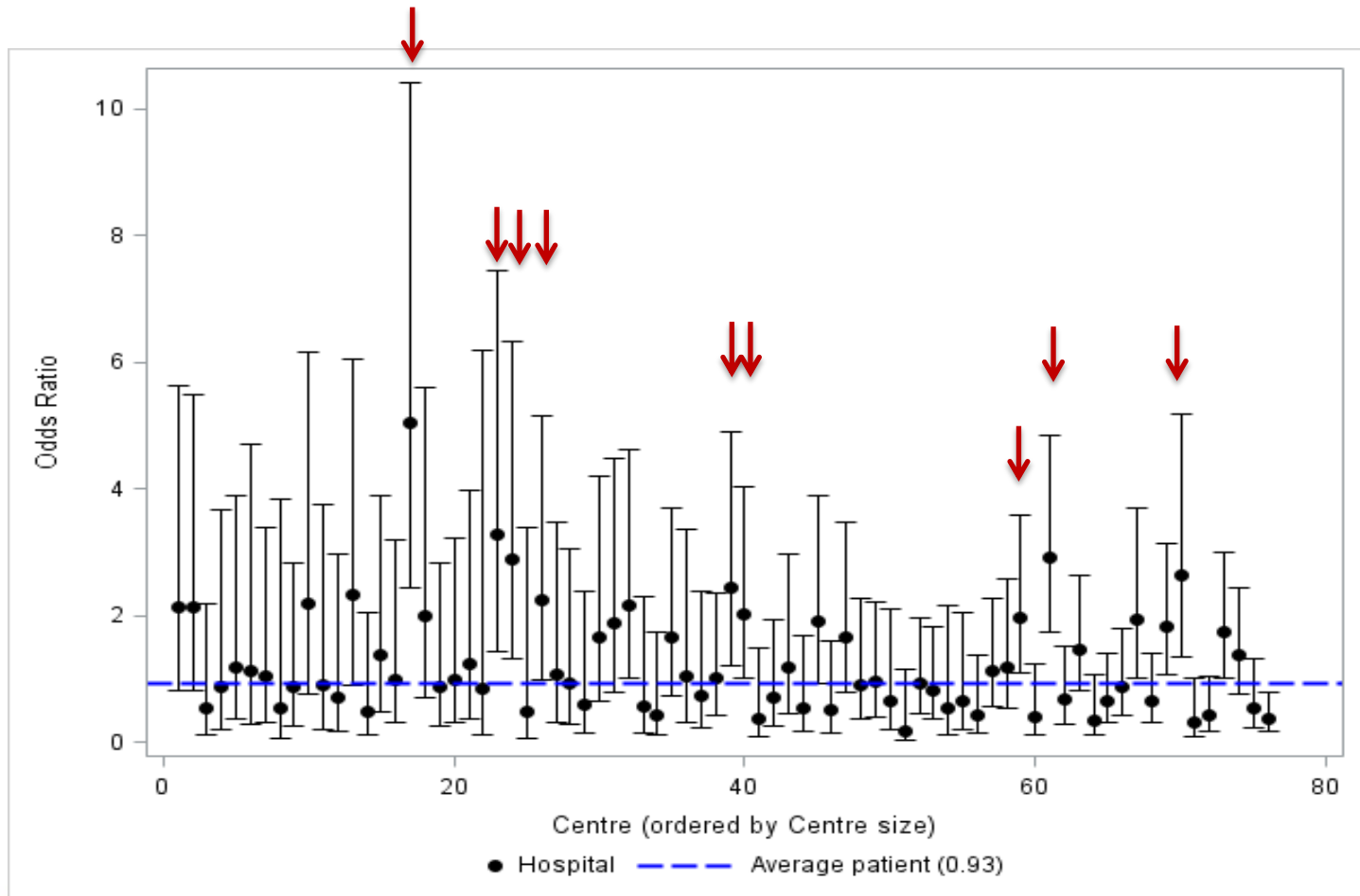
# % TNM stage for rectal cancer reported to the Cancer Registry, Belgian hospitals 2009-2011



# Outcome indicators for Belgian hospitals

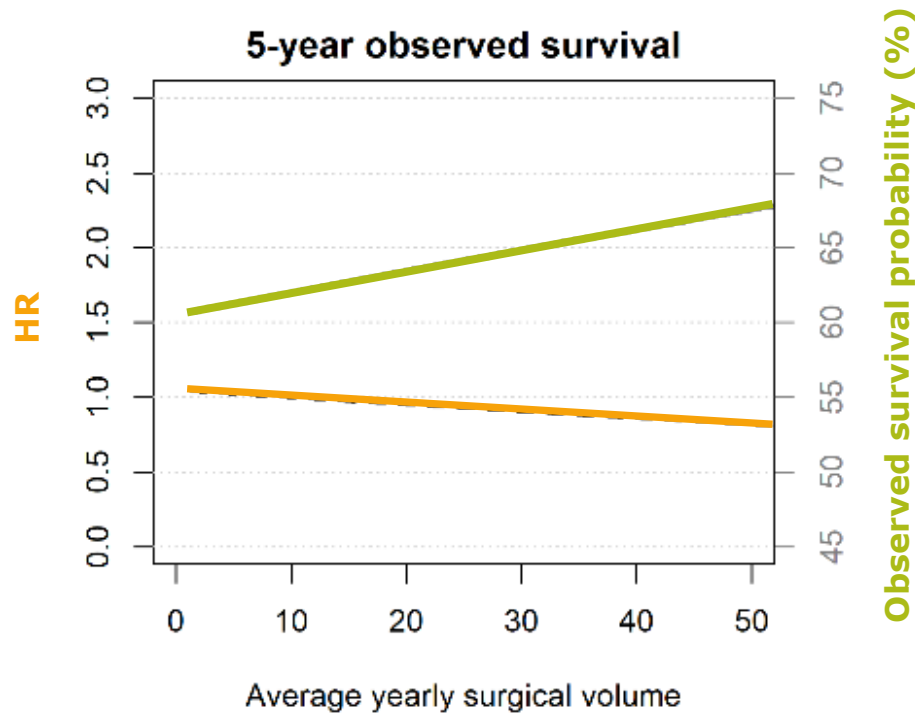
## Rectal cancer:

Adjusted Odds ratio, 90 days postoperative mortality, Belgium, 2006-2011,  
(adjusted for age, sex, c Stage, performance status at diagnosis)



# Rectal cancer: surgical volume-outcome

Methods: Piecewise proportional hazards Cox regression model  
 centre volume as continuous variable  
 adjusted for gender, age, clinical stage and WHO performance score



Yearly surgical volume	HR	Predicted 5 yr-Overall survival
10 /yr	1 (ref)	62%
20 /yr	0.95	63%
50 /yr	0.82	68%



# Radiotherapy: optimal utilization?



Contents lists available at ScienceDirect

Radiotherapy and Oncology

journal homepage: [www.thegreenjournal.com](http://www.thegreenjournal.com)



Original article

## The optimal utilization proportion of external beam radiotherapy in European countries: An ESTRO-HERO analysis <sup>☆</sup>

Josep M. Borrás <sup>a,\*</sup>, Yolande Lievens <sup>b</sup>, Peter Dunscombe <sup>c</sup>, Mary Coffey <sup>d</sup>, Julian Malicki <sup>e</sup>, Julieta Corral <sup>f,g</sup>, Chiara Gasparotto <sup>h</sup>, Noemie Defourny <sup>b</sup>, Michael Barton <sup>i</sup>, Rob Verhoeven <sup>j</sup>, Liesbeth van Eycken <sup>k</sup>, Maja Primic-Zakelj <sup>l</sup>, Maciej Trojanowski <sup>m</sup>, Primoz Strojman <sup>n</sup>, Cai Grau <sup>o</sup>

- “Optimal utilization proportion’ (OUP) for Belgium: 53,2%”

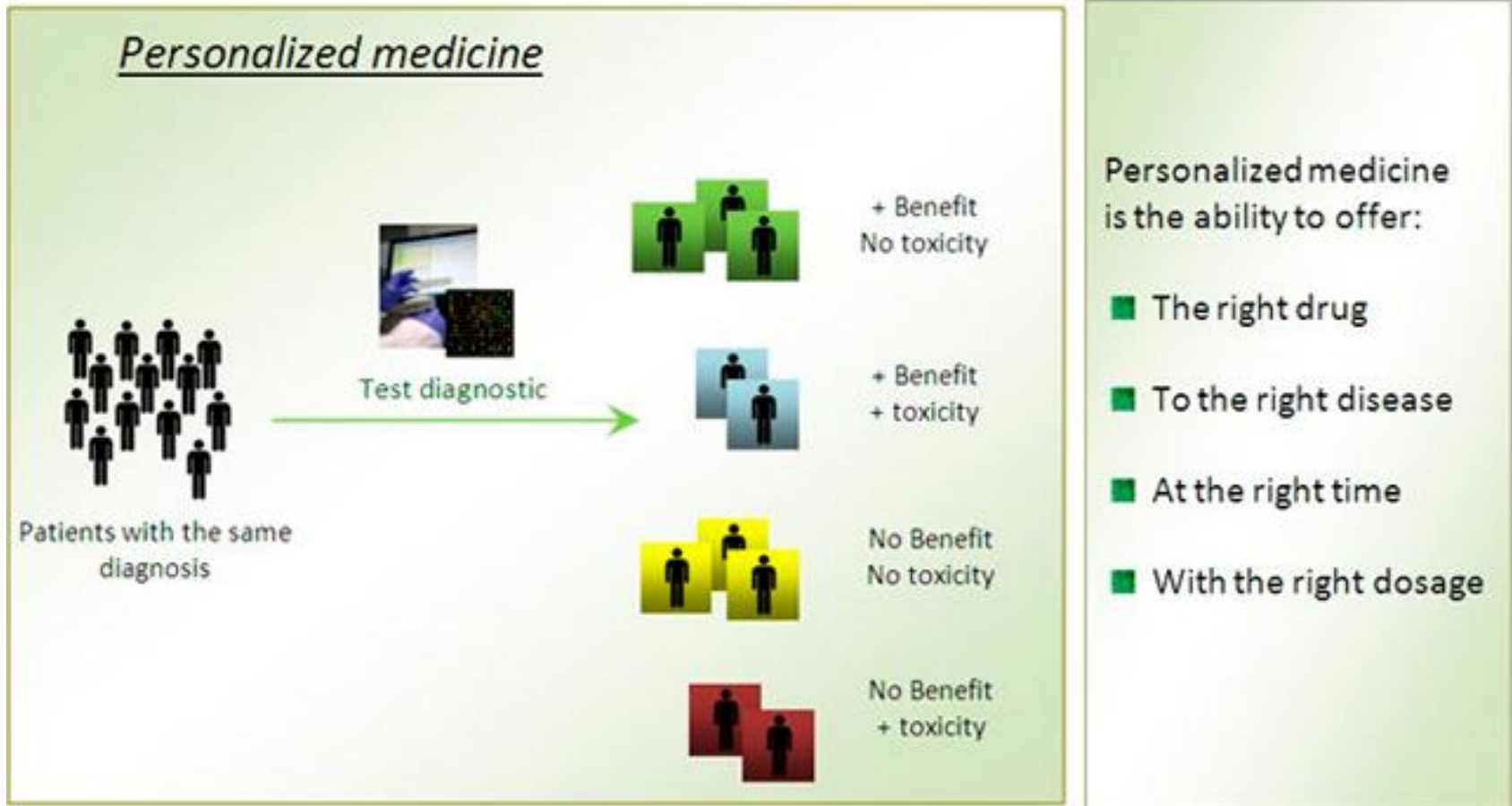
## Results on 5 most frequent cancers : Advised, Actual and Optimal RT Utilization proportion in Belgium

Category	Advised RT utilization (MOC COM)		Actual RT utilization (IMA AIM)	Optimal RT utilization 2010-2011
	%	Min-Max (%)	%	%
Breast	73.8	[68 ; 76]	76.80	86.2
Head and neck	70.2	[62 ; 74]	71.85	82.8
Lung	35.9	[31 ; 44]	46.17	76.9
Prostate	33.4	[26 ; 48]	37.97	58.5
Rectum	54.4	[48 ; 60]	57.26	63.0
<b>TOTAL</b>	<b>35.2</b>	<b>[30 ; 46]</b>	<b>38.75</b>	<b>53.3</b>



Radiotherapy access in Belgium: How far are we from evidence-based utilization?  
 Y. Lievens, H. De Schutter, K. Stellamans, M. Rosskamp, L. Van Eycken  
 Eur J Cancer. 2017 Oct;84:102-113

# Evolution to Personalized medicine

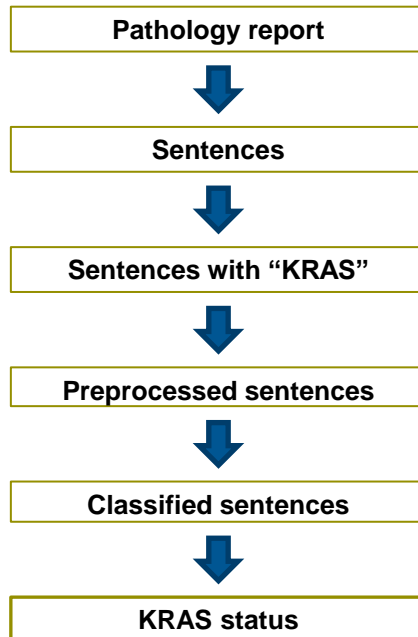


# Example: Machine learning techniques, KRAS in colorectal cancer, Belgian Cancer Registry, 2004-2014

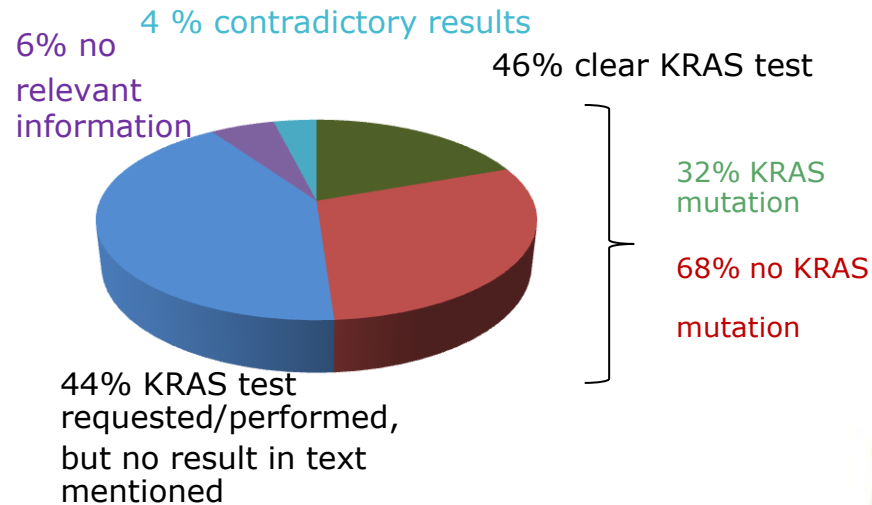
## Methodology

2004-2014

11,446 colorectal cancer reports



## Results



# Examples of European collaborations: outcome research

- ◆ Eurocare
  - Survival studies, comparisons EU countries & regions
- ◆ Eurocare, high resolution studies
  - (Limited) clinical data to explain e.g. variability

European Journal of Cancer 84 (2017) 335–353

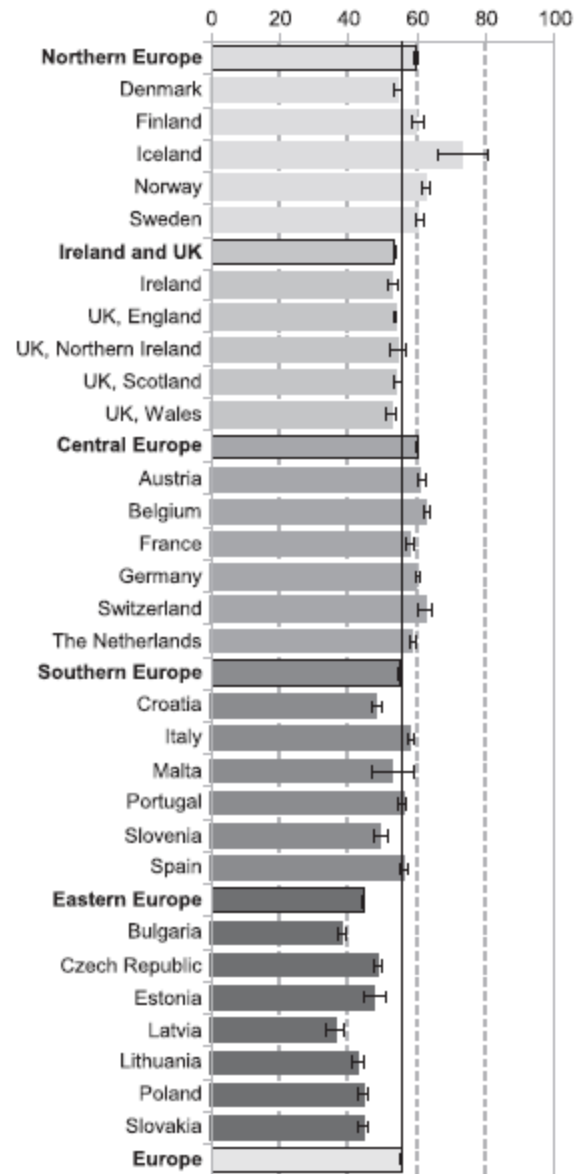
Quality analysis of population-based information on cancer stage at diagnosis across Europe, with presentation of stage-specific cancer survival estimates: A EUROCORE-5 study



Pamela Minicozzi <sup>a,\*</sup>, Kaire Innos <sup>b</sup>, Maria-José Sánchez <sup>c,d</sup>,  
Annalisa Trama <sup>e</sup>, Paul M. Walsh <sup>f</sup>, Rafael Marcos-Gragera <sup>g</sup>,  
Nadya Dimitrova <sup>h</sup>, Laura Botta <sup>c</sup>, Otto Visser <sup>i</sup>, Silvia Rossi <sup>j</sup>,  
Andrea Tavilla <sup>k</sup>, Milena Sant <sup>a</sup>, The EUROCORE-5 Working Group<sup>l</sup>

Age-standardised 5-year relative survival (%)

B. Holleczer et al. / *European Journal of Cancer* 51 (2015) 2158–2168



Rectal and anal canal cancer, 2000-2007

# EURECCA:

## Colon cancer, stage II, % adjuvant chemotherapy

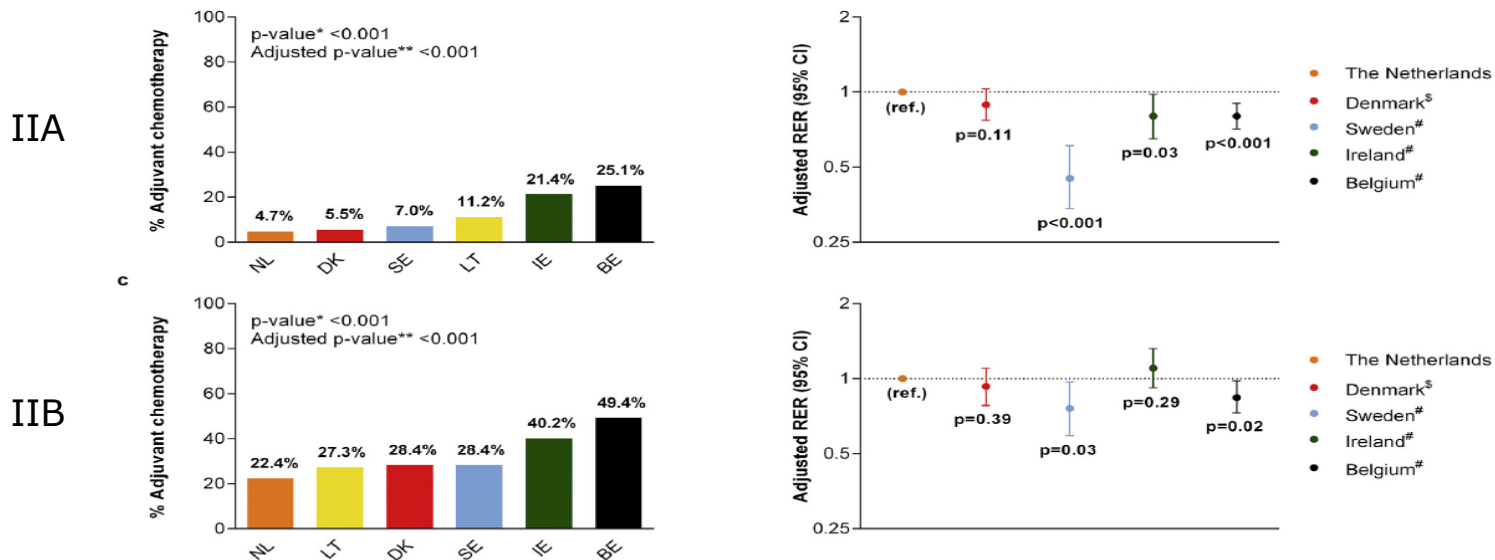


Fig. 1. Proportion of patients receiving adjuvant chemotherapy and adjusted relative excess risks (RERs) of death by country for patients with a) stage II colon cancer, b) stage IIA colon cancer, c) stage IIB colon cancer, 2004–2009. \* p-value for comparison of NL, DK, SE, ENG, IE, and BE. \*\* p-value for comparison of NL, DK, SE, ENG, IE, and BE adjusted for gender, age, and year of incidence. \*\*\*

# Challenges for the future

- ◆ Need for more clinical relevant and structured data from the hospitals, cancer centres
  - Standardisation of reports
    - Synoptic reporting e.g. pathology, radiology
  - Electronic hospital/medical records
  - Patient reported outcomes and experiences
- ◆ Use information technology, Capture data from Health records
  - Text recognition and machine learning techniques, AI
- ◆ Close collaboration of Cancer Registries and Cancer Centres to optimize data collection, data handling, data analysis and interpretation



# Conclusion

- ◆ **A win-win partnership between Cancer Registries and Cancer Centres (CC)**
- ◆ **For Cancer Registries (CR):**
  - CC are the source of some interesting data (i.e. through the multidisciplinary team report, labs,... )
  - CC are source of expertise (health care providers but also patients) to analyse results
- ◆ **For Cancer Centres (CC):**
  - CR are source of some unavailable data in hospitals and of expertise in quality of data, building of indicators and epidemiology
  - CR are source of data and independent expertise for benchmarking between hospitals on quality of cancer care

# Conclusion

## Cancer Outcome research:

**Need for a population based approach in a strong partnership between Cancer Registries and Cancer Centres, using 'all' pertinent and validated available information in order to obtain the most relevant, timely delivered and high quality information, with the aim of measuring the impact of the actions taken to improve quality, both at the cancer centre level and at the european level**



