Belgian Cancer Registry

Use of Cancer Registration in Quality Indicators of surgical procedures

Symposium EUMASS Brussels, 28th of February 2020

www.kankerregister.org I www.registreducancer.org

Dr. Liesbet van Eycken

Overview

- Introduction
- Oesophageal and Pancreatic Cancer Surgery: history of centralisation
  - Incidence and surgical procedures in Belgium
  - History centralization: 2008-2019
  - Data input Cancer Registry
  - Analysis and Results / volume - outcome
- Conclusion

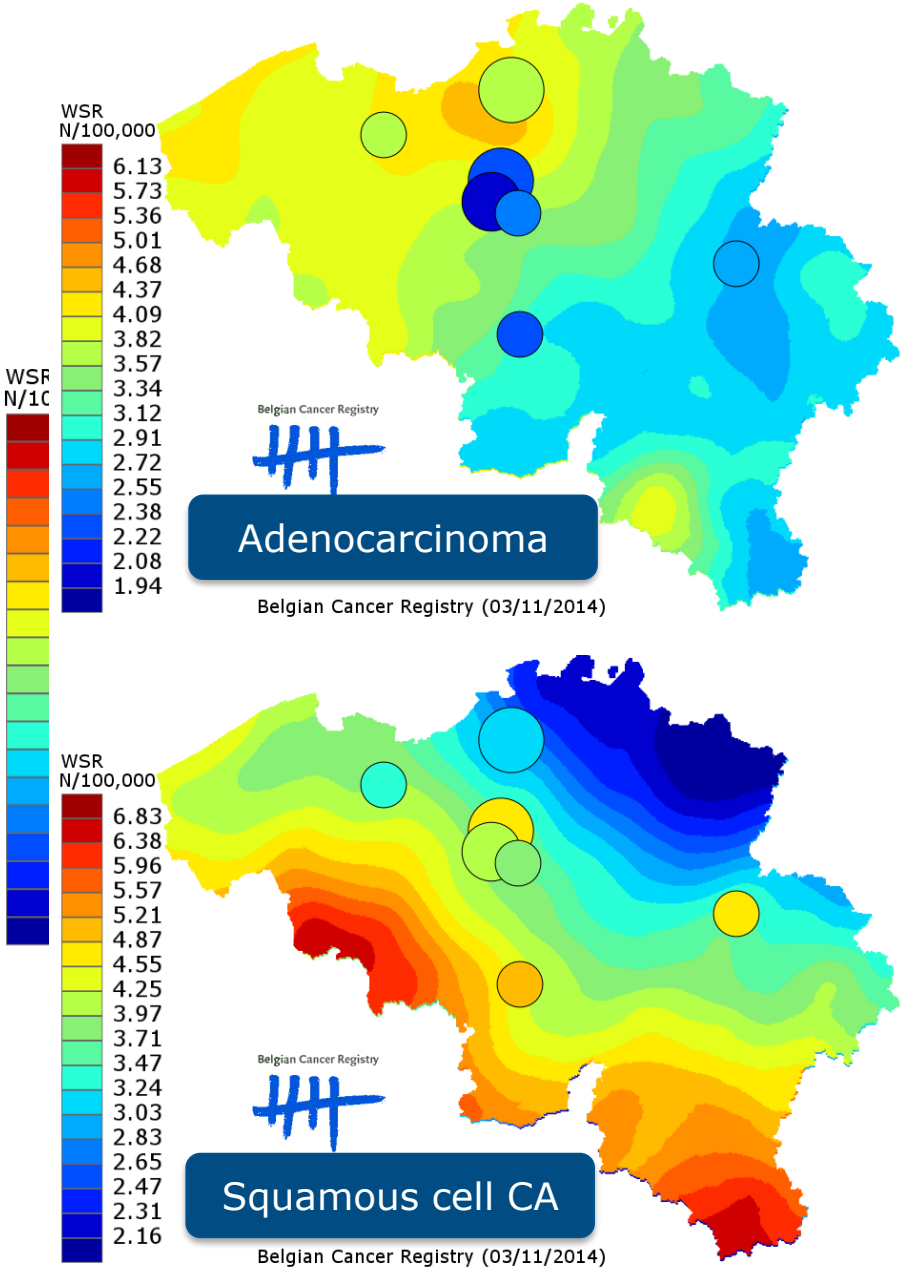
Oesophageal and Pancreatic Cancer in Belgium

- Cancer Incidence – Belgium, population 11 Mio
  - Yearly 2.000 new pancreatic cancers => 500 resections
  - Yearly 1.500 new oesophageal cancers => 400 resections

Oesophageal Cancer Incidence in Belgium

Oesophagus

About 1500 cases/year
400 resections/ year



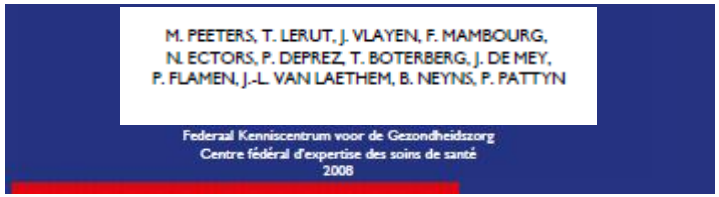
Henau K, Van Eycken E, Silversmit G, Pukkala E, Cancer Epidemiology, 2015 Feb;39(1):55-65, Regional variation in incidence for smoking and alcohol related cancers in Belgium.

History of Centralisation

Belgian Health Care Knowledge Centre, 2008

Literature:
Minimal volume
20 resections/yr

30. Oesophageal cancer surgery should be carried out in high volume specialist surgical units by surgeons with experience and/or specialist training in oesophageal and gastro-oesophageal junction cancer (IC recommendation).



2012, Guideline update

KCE REPORT 179A

KCE
Federaal Kenniscentrum voor de Gezondheidszorg
Centre Fédéral d'Expertise des Soins de Santé
Belgian Health Care Knowledge Centre

UPDATE VAN DE PRAKTIJKRICHTLIJN VOOR SLOKDARM- EN MAAGKANKER

TONI LERUT, SABINE STORDEUR, LEEN VERLEYE, JOAN VLAYEN, TOM BOTERBERG, GERT DE HERTOGH, JOHAN DE MEY, PIERRE DEPREZ, PATRICK FLAMEN, PIET PATTYN, JEAN-LUC VAN LAETHEM, MARC PEETERS

Chirurgische behandeling

Aanbeveling

Chirurgie voor slokdarmkanker moet gebeuren in gespecialiseerde centra met een hoog volume en met de nodige ervaring en/of specialisten opgeleid in de aanpak van kanker van de slokdarm en van de gastro-oesofagale overgang.

2012 www.kce.fgov.be .be

RECOMMENDATIONS (KCE responsibility)

Ter attentie van de Minister, na advies van de bevoegde organen (Nationale Raad voor Ziekenhuisvoorzieningen, Geneeskundige Technische Raad, College van Geneesheren voor Oncologie)

- Hoewel de literatuur over de volume-uitkomst relatie van kanker van de bovenste gastrointestinale tractus hoofdzakelijk beperkt is tot chirurgie, moet de volledige behandeling gecentraliseerd worden in centra met specialisten opgeleid voor, en met hoog-volume ervaring in de aanpak van kanker van de bovenste gastrointestinale tractus.
- Analoog aan het PROCARE project moet geschikte opleiding en peer review georganiseerd worden om een behandeling van hoge kwaliteit te verzekeren voor patiënten met kanker van de bovenste gastrointestinale tractus.

2013

KCE REPORT 200

Federaal Kenniscentrum voor de Gezondheidszorg
Centre Fédéral d'Expertise des Soins de Santé
Belgian Health Care Knowledge Centre

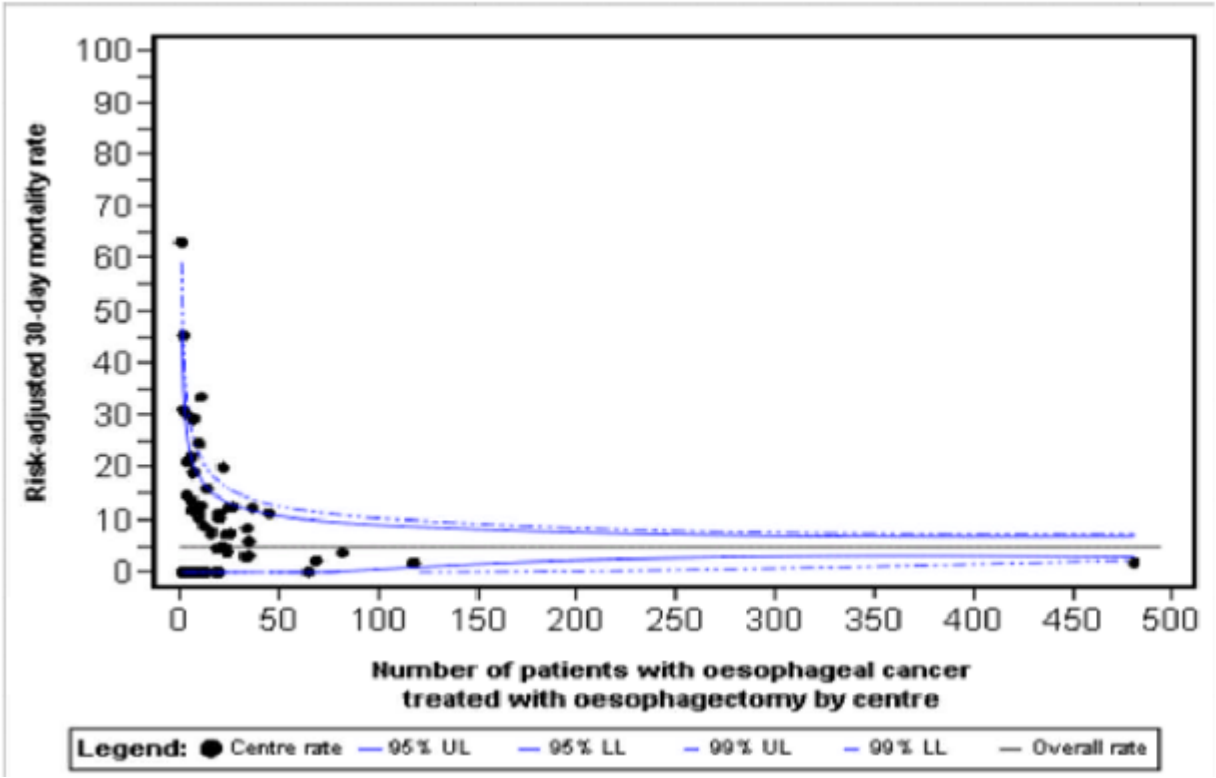
QUALITY INDICATORS FOR THE MANAGEMENT OF UPPER GASTROINTESTINAL CANCER

2013 www.kce.fgov.be

JOAN VLAYEN, CINDY DE GENDT, SABINE STORDEUR, VIKI SCHILLEMANS, CÉCILE CAMBERLIN, FRANCE VRIJENS, ELIZABETH VAN EYCKEN, TONI LERUT

Belgian Cancer Registry

Funnel plot: 30 days postoperative mortality after oesophagectomy, adjusted for age and stage, 2004-2008



Postoperative mortality 30 days: 5,4%

KCE report 200, Data from the Belgian Cancer Registry

2013

Christian Mutualities publish a hospital list with results of the surgical treatment (postoperative mortality) for oesopahgeal cancer

De Standaard 17/6/2013

CM publiceert lijst met sterke en zwakke ziekenhuizen

Het christelijk ziekenfonds CM heeft een taboe doorbroken. Het informeert zijn leden voor het eerst in welke ziekenhuizen ze zich het best kunnen laten behandelen voor slokdarmkanker - en dus ook in welke niet. De Standaard kreeg de lijst in handen.

KCE REPORT 219As

KCE
Federaal Kenniscentrum voor de Gezondheidszorg
Centre Fédéral d'Expertise des Soins de Santé
Belgian Health Care Knowledge Centre

2014

SYNTHESE

ORGANISATIE VAN DE ZORG VOOR VOLWASSENEN MET EEN ZELDZAME OF COMPLEXE KANKER

2014 www.kce.fgov.be

Minimal volume
12 resections/yr

CANCERS OF THE OESOPHAGUS

PREFERRED MODEL OF CARE AND CRITERIA FOR REFERENCE CENTRES

Coordinators: Toni Lerut (Surgery, UZ Leuven) and Philippe Nafteux (Surgery, UZ Leuven)

Authors : Toni Lerut (Surgery, UZ Leuven), Philippe Nafteux (Surgery, UZ Leuven), Tom Boterberg (Radiation oncology, Universiteit Gent), Paul Leyman (Surgery, GZA), Donald Claeys (Surgery, AZ Maria Middelares Gent), Jean-Marie Collard (Surgery, UCL), Claude Cuvelier (Pathology, UZ Gent), Pieter Demetter (Pathology, Hôpital Erasme), Pierre Deprez (Gastroenterology, UCL), Dirk De Vriendt (Surgery, AZ Groeninge), Karin Haustermans (Radiation oncology, UZ Leuven), Anne Jouret-Mourin (Pathology, UCL), Jan Lesaffer (Surgery, AZ Sint-Jan Brugge), Piet Pattyn (Gastrointestinal Surgery, Universiteit Gent), Marc Peeters (Gastroenterology, UZA), Hans Prenen (Digestive oncology, UZ Leuven), Xavier Sagaert (Pathology, UZ Leuven), Daniel Van Daele (Gastroenterology, CHU Liège), Tom Van der Vurst (Surgery, CHR Namur), Jean-Luc Van Laethem (Gastroenterology, ULB), Yves Van Molhem (Surgery, OLVZ Aalst), Joseph M. Weerts (Surgery, CHC Liège)

IMA – AIM, press communication Intermutualistic Agency

Press, 30 September 2014

Need for centralisation of expertise for rare and complex diseases

Nood aan concentratie van expertise voor zeldzame en complexe aandoeningen

De overlevingskans bij chirurgie voor slokdarmkanker en pancreaskanker is merkelijk hoger in ziekenhuizen die er veel ervaring mee hebben, blijkt uit studies van het KCE. Toch komt maar een op de drie patiënten in die ziekenhuizen terecht. Het Intermutualistisch Agentschap (IMA) en de ziekenfondsen publiceren daarom het aantal patiënten per ziekenhuis dat voor die kankers een ingreep hebben ondergaan en pleiten voor een concentratie van expertise van zorg voor zeldzame en complexe aandoeningen.

2017-2019

- Roadmap Minister of Health, 2015-2018: initiatives for centralisation
  - Surgery for (lung) pancreas and oesophageal cancer

RIZIV-INAMI: Start of the meetings December 2016 => June 2019

Working group of MEDICOMUT

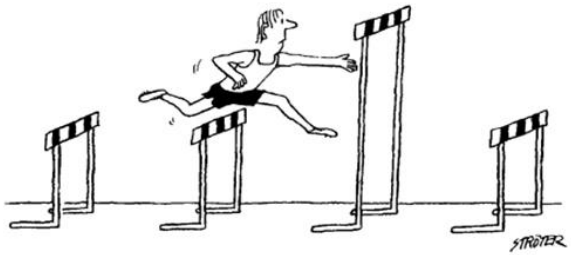
=> Verzekeringscomité – Comité d'Assurance

Oesophageal and Pancreatic Cancer: What is the postoperative mortality in Belgium? => Belgian Cancer Registry

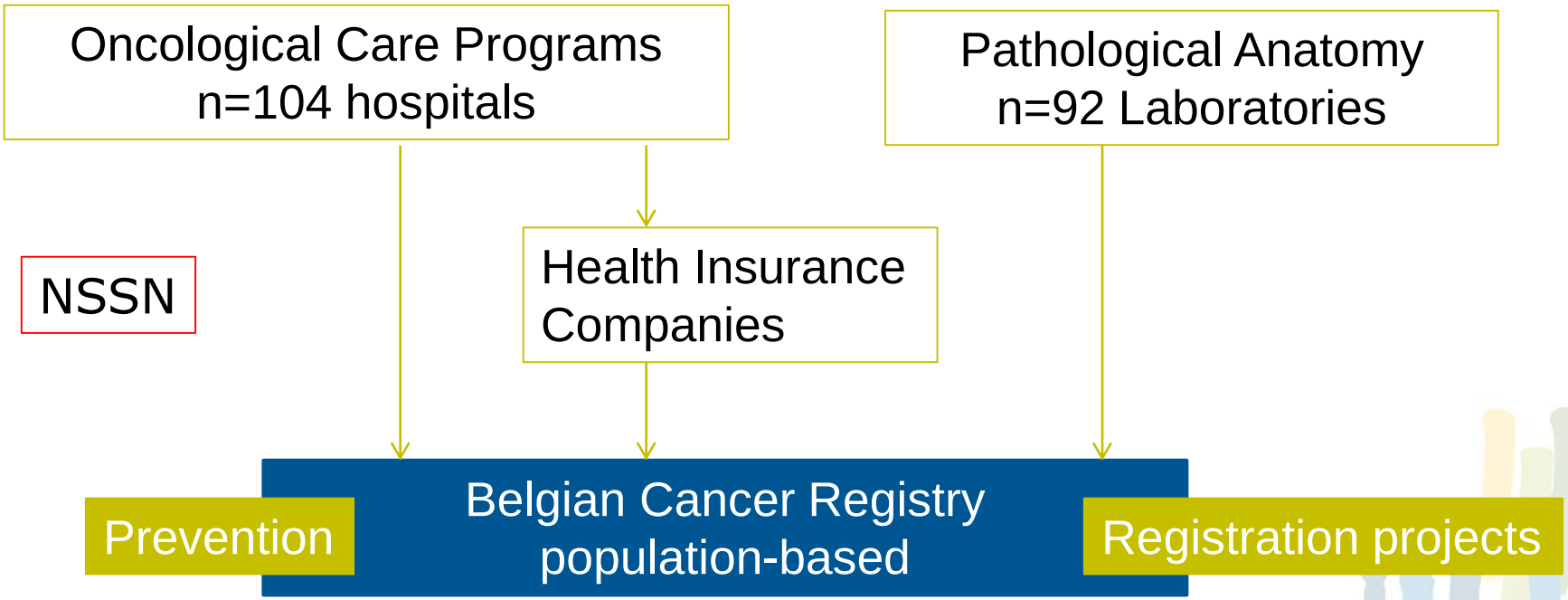
Oesophageal and Pancreatic Cancer: Postoperative mortality in Belgium? 2008-2015

Aim

- What is the postoperative 90 days mortality for oesophageal cancer in Belgium?
- Is there any variability between centres?
- Is there any volume-outcome association?



Data input



Structured data: patient and tumour characteristics, treatment categories

Unstructured data: Full text pathology reports, MDT registration forms
USING MACHINE LEARNING: text and data mining

Flemish Region: 2000-2017
Belgium :2004-2017

Data input: additional data

Belgian Cancer Registry
population-based

ALL - STANDARD

- Vital status ★
- Causes of death
- Reimbursement data ★
  nomenclature:
  diagnosis and therapy

PROJECT-SPECIFIC

- Hospital discharge data ★
- Belgian census ★
- Administrative socio-economic information ★

★use of national security number

Intermutualistic Agency- IMA data: input

- 2009: authorisation of the Privacy Commission

- For all patients:
  - cancer-related clinical acts (diagnostic & therapeutical)
  - pharmaceutical specialties (medication)
  - hospitalisations

- For each patient: 1 year before incidence year and 5 years after incidence year

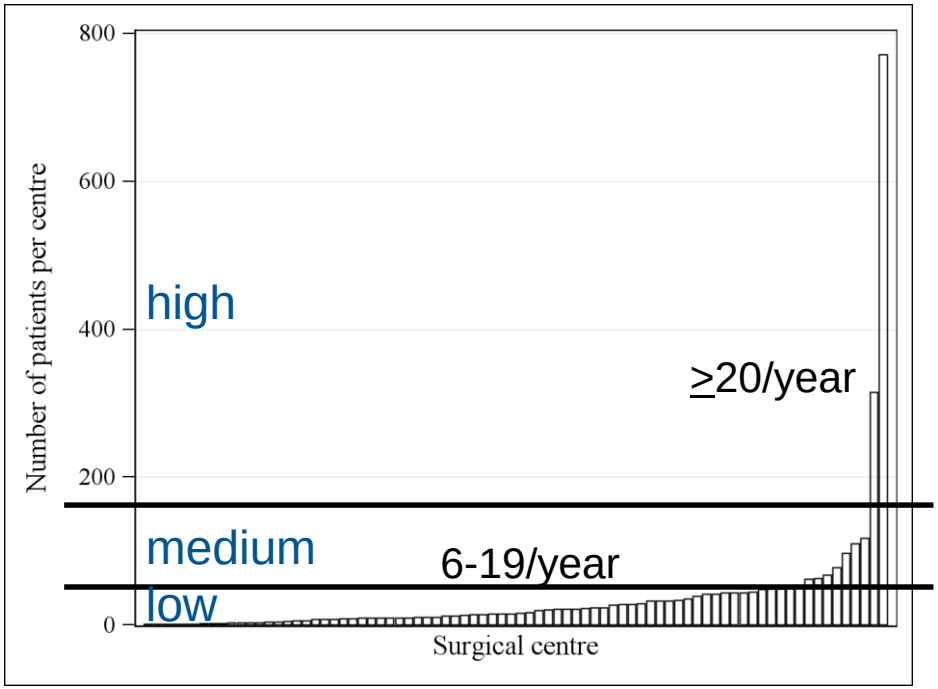
Methods

- Data 2008-2015, all Belgian hospitals
  - surgery oesophagus n = 2.983 cases
  - surgery pancreas n = 3.655 cases
- Post-op mortality at 90 days (%)
  - Centre variability visualised with funnel plots, 95% PI
  - Adjustment for patient case mix using logistic regression
    - Sex, age, stage, WHO performance, previous inpatient days, comorbidities (diabetic, respiratory and cardiovascular), neo-adjuvant therapy (oesophagus), clustering of patients into hospitals
  - Adjusted hospital Odds Ratios (OR) visualised in forest plots

Surgical Caseload by Hospital, 2008-2015

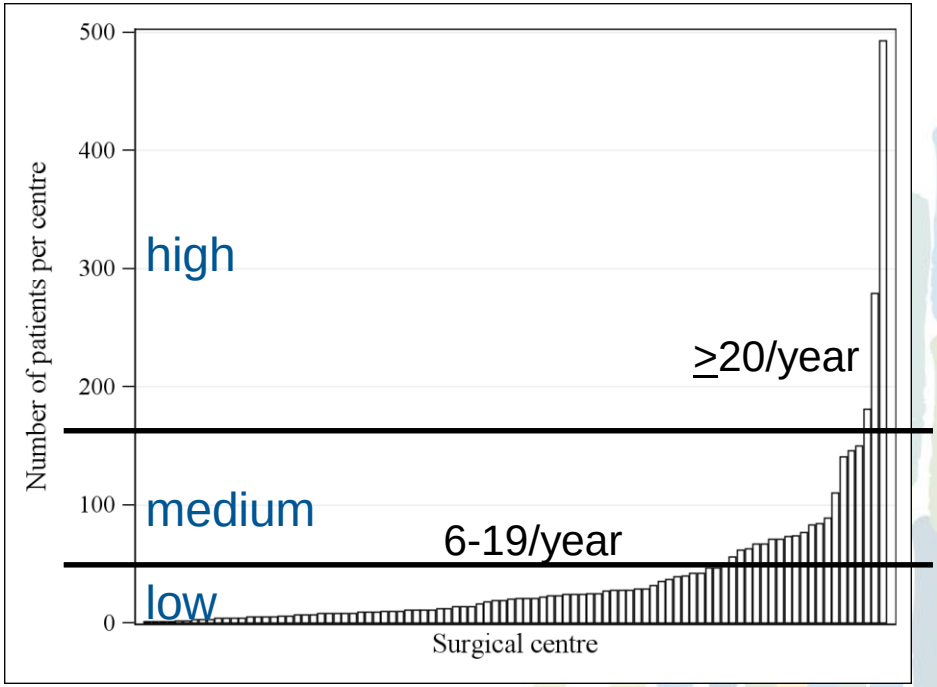
Oesophagus

N=80, range 1-771 surgeries



Pancreas

N=94, range 1-493 surgeries



90-Day Post-op Mortality, 2008-2015

Oesophagus

		90-day post-op mortality	
	N	%	95% CI
Overall	2,982	9.3	[8.2, 10.3]
Volume per year			
low	1,055	12.1	[10.2, 14.1]
medium	841	10.9	[8.9, 13.1]
high	1,086	5.2	[4.0, 6.6]

$p < 0.0001$

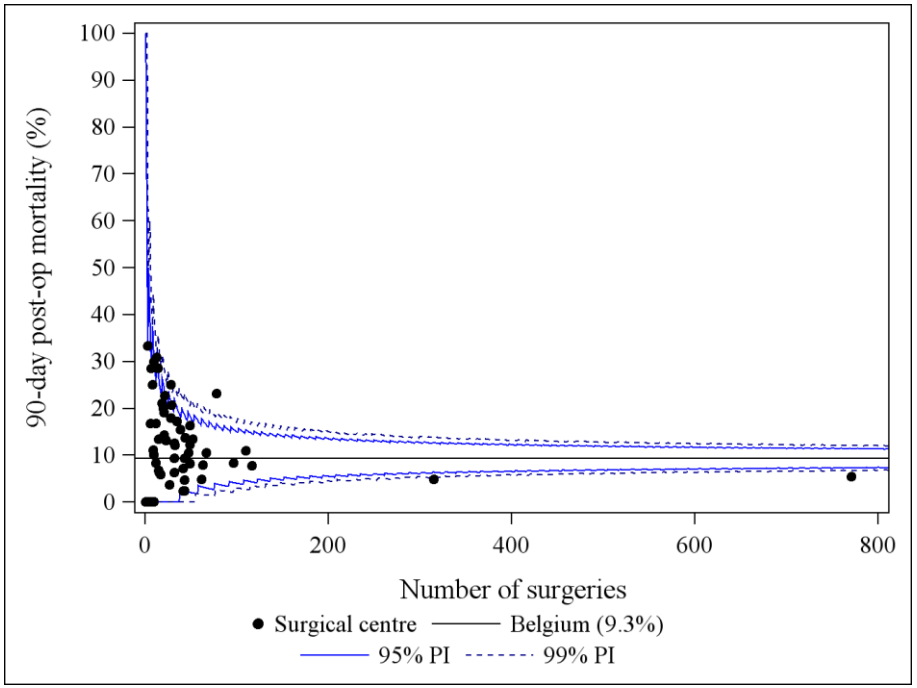
Pancreas

		90-day post-op mortality	
	N	%	95% CI
Overall	3,651	8.1	[7.3, 9.0]
Volume per year			
low	1,166	9.9	[8.2, 11.7]
medium	1,533	8.5	[7.1, 9.9]
high	952	5.4	[4.0, 6.8]

$p = 0.0005$

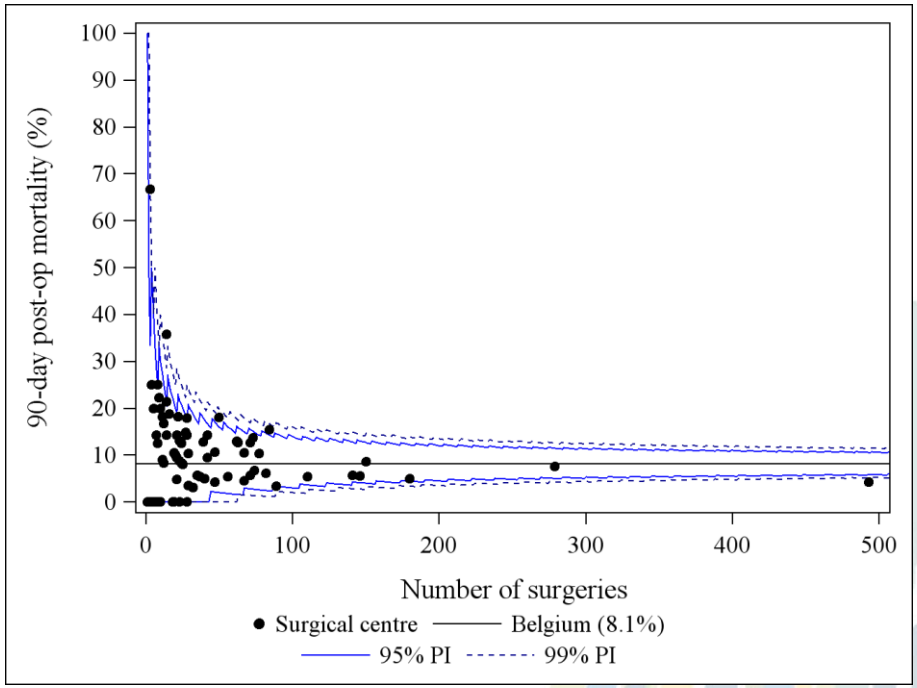
Centre variability: 90 Day Post-op Mortality, 2008-2015

Oesophagus



Variability as expected
Two largest hospitals: lower mortality

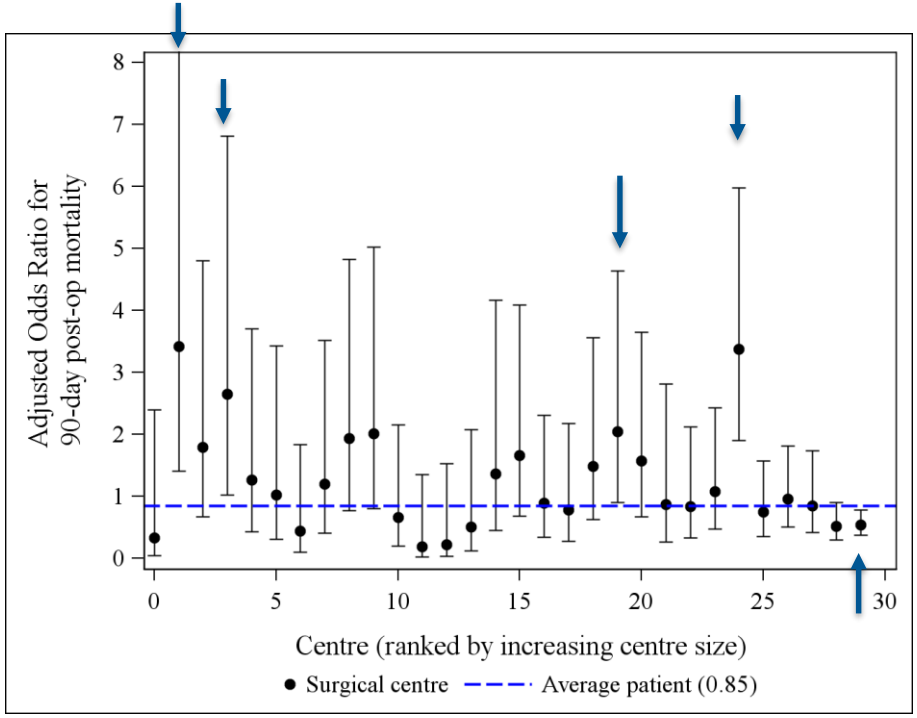
Pancreas



Variability as expected
Largest hospital: lower mortality

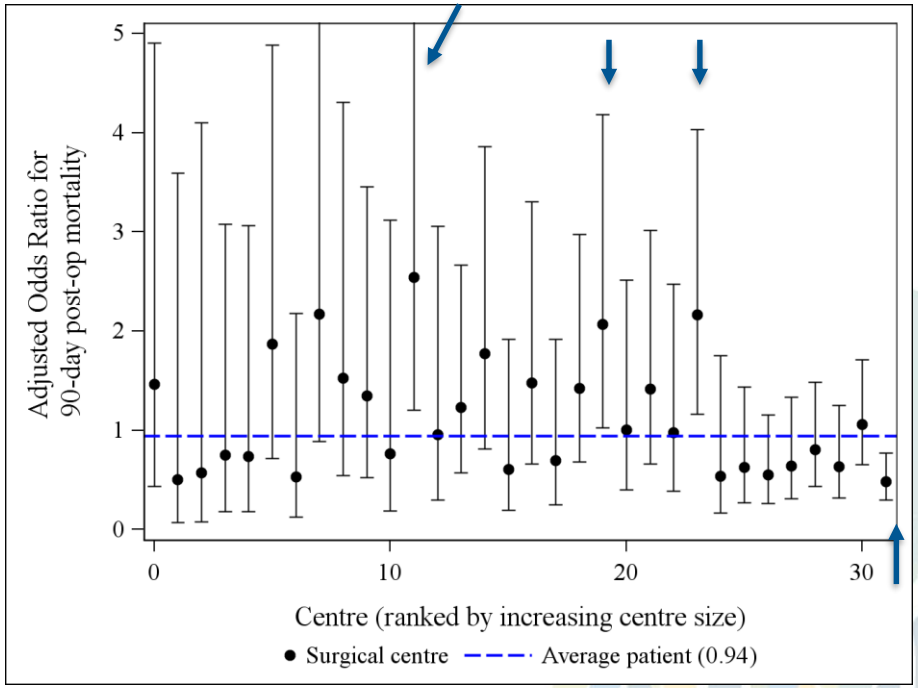
Centre Variability - Case Mix Adjusted, 2008-2015

Oesophagus



Centres with at least 25 surgeries

Pancreas



Centres with at least 28 surgeries

Adjustment: Sex, age, stage, WHO performance, previous inpatient days, comorbidities,neo-adjuvant therapy (oesophagus), clustering of patients into hospitals

Volume Association - Case Mix Adjusted

Oesophagus

Explorative volume categories

Adjusted odds ratio			
Volume	Estimate	95% CI	p-value
medium vs low	0.95	[0.65, 1.39]	0.7869
high vs low	0.43	[0.23, 0.80]	0.0079

Continuous volume approach

Adjusted odds ratio			
Volume	Estimate	95% CI	p-value
≥ 35/yr vs <35/yr	0.44	[0.24, 0.79]	0.0065

Contrast 2 largest hospitals vs others

Pancreas

Explorative volume categories

Adjusted odds ratio			
Volume	Estimate	95% CI	p-value
medium vs low	0.82	[0.60, 1.12]	0.2035
high vs low	0.51	[0.32, 0.83]	0.0067

Postop mortality is lower in high volume hospitals

Continuous volume approach

Adjusted odds ratio			
Volume	Estimate	95% CI	p-value
per additional 1 case/yr	0.98	[0.97, 0.99]	0.0001

Linear decrease in OR per additional increase of 1 case/year

2017-2019

- Roadmap Minister of Health, 2015-2018: initiatives for centralisation
  - Surgery for (lung) pancreas and oesophageal cancer

RIZIV-INAMI: Start of the meetings December 2016 => June 2019

Working group of MEDICOMUT

=> Verzekeringscomité – Comité d'Assurance

=> Convention 1/7/2019

OVEREENKOMST TUSSEN HET VERZEKERINGSCOMITE VAN DE DIENST VOOR GENEESKUNDIGE VERZORGING VAN HET RIZIV EN ERKENDE VERPLEGINGSINRICHTINGEN VOOR DE VERGOEDING VAN COMPLEXE CHIRURGIE BIJ SLOKDARMTUMOREN, GASTRO-OESOFAGALE JUNCTIE TUMOREN EN NIET-ONCOLOGISCHE AANDOENING VAN DE SLOKDARM

- 10 centers for surgery oesophagus, 15 for pancreas – 'Consortium'
  - -volume 20 or (10+10)

CENTRA VOOR COMPLEXE SLOKDARMCHIRURGIE
CENTRES POUR CHIRURGIE COMPLEXE DE L'ŒSOPHAGE

ERKENNINGS-NUMMER	CENTRUM VOOR COMPLEXE SLOKDARMCHIRURGIE	ADRES	POST	GEMEENTE	SAMENWERKING MET [1]
NUMERO D'AGREMENT	CENTRE POUR CHIRURGIE COMPLEXE DE L'ŒSOPHAGE	ADRESSE	POST	COMMUNE	COLLABORATION AVEC [1]
710406-22-194	ULB HÔPITAL ERASME	ROUTE DE LENNIK 808	1070	ANDERLECHT	
710403-25-194	CLINIQUES UNIVERSITAIRES SAINT-LUC	AVENUE HIPPOCRATE 10	1200	BRUXELLES	
710300-31-194	UZ ANTWERPEN	WILRIJKSTRAAT 10	2650	EDEGEM	ZIEKENHUIS NETWERK ANTWERPEN
710322-09-194	UNIVERSITAIR ZIEKENHUIS LEUVEN	HERESTRAAT 49	3000	LEUVEN	
710371-57-194	ZIEKENHUIS OOST-LIMBURG – SITE ST. JAN	SCHIEPSE BOS 6	3600	GENK	JESSA ZIEKENHUIS - HASSELT
710707-12-194	CHU DE LIEGE – SITE SART TILMAN	AVENUE HIPPOCRATE 15, B 35	4000	LIEGE	
710039-01-194	CHU UCL NAMUR – SITE GODINNE	AVENUE DR. G. THERASSE 1	5530	YVOIR	CLINIQUE SAINT-LUC BOUGE
710534-88-194	CENTRE HOSPITALIER DE WALLONIE PICARDE – SITE UNION	AVENUE DELMEE 9	7500	TOURNAI	GRAND HOPITAL DE CHARLEROI
710117-20-194	AZ DELTA	RODE KRUISSTAAT 20	8800	ROESELAERE	AZ SINT-JAN BRUGGE OOSTENDE
710670-49-194	UNIVERSITAIR ZIEKENHUIS GENT	CORNEEL HEYMANSLAAN 10	9000	GENT	VZW ALGEMEEN ZIEKENHUIS SINT-LUKAS & VOLKSKLINIEK

Obligatory registration of dataset: Indicators

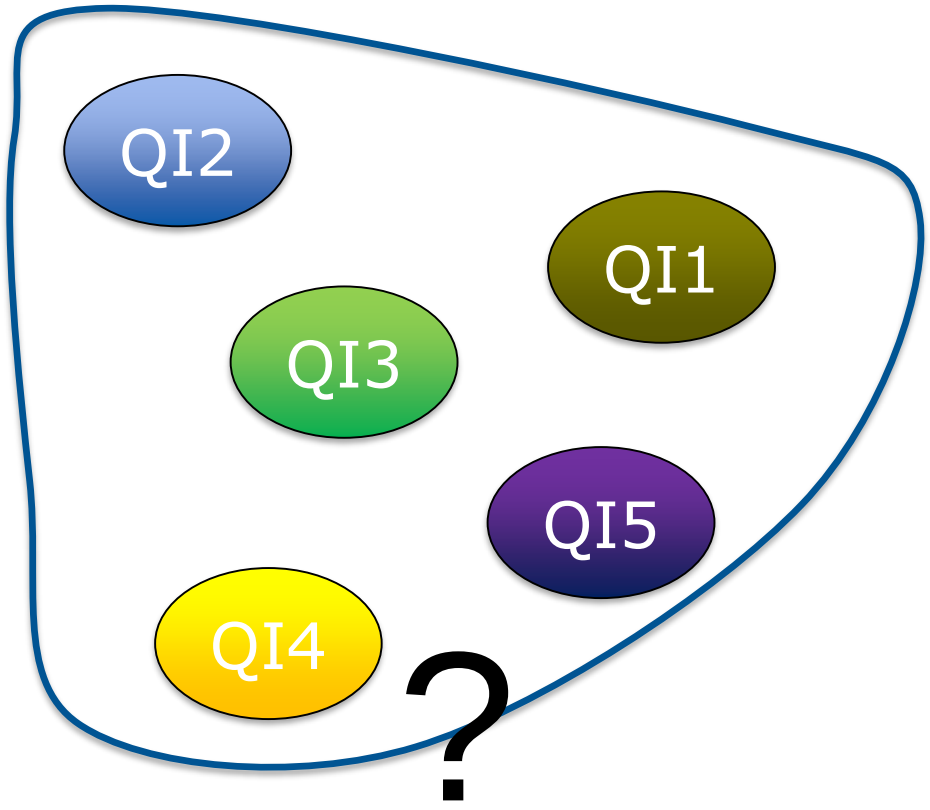
	Oesophagus	Pancreas
Descriptives		
Patient case mix	X	X
N surgeries/year (surgical volume)	X	X
% complete registrations	X	X
% lymfocascular/perineural invasion	X	
Process indicators		
Time diagnosis - start treatment	X	X
Time diagnosis - referral	X	X
Length of stay	X	X
% resections with ≥15 lymph nodes examined	X	X
% PET/CT performed before surgery	X	
% pT1a patiens treated surgically	X	
Outcome indicators		
Postoperative mortality (observed + adjusted OR)*: 30d, 90d, in-hospital*	X	X
Survival (observed + adjusted HR)	X	X
Relative survival (observed + adjusted EHR)	X	X
% R0, … resections *(3-4 sub-indicators)*	X	X
% major surgical complications *(5-7 sub-indicators)*	X	X

Work in progess on Evaluation Methodology

"The numbers on my report card aren't good, but I question the school's methodology."

Aggregate score

- Combine results on different QI into one "composite score"



Selection
QI score

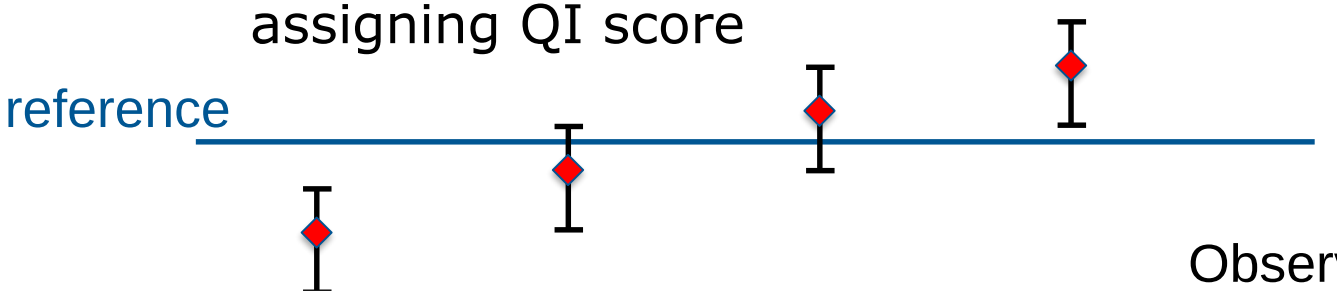
?

S

Sum
Average
Weighted average
Product
All-or-none
…

Score: statistical significance

- Keep It Simple
- Centre score
  - Always use confidence interval in comparison and assigning QI score



Observed centre outcome
Adjusted OR/HR/EHR

A:	**-2**	**0**	**0**	**+2**
B:	**0**	**2**	**2**	**4**
C:	**0**	**1.5**	**2.5**	**4**
D:	**1**	**2**	**2**	**4**
E:	**?**	**?**	**?**	**?**

  - Case-mix adjustment where possible

Registration 1/7/2019

1/7/2019 => 3 years

Analysis after each year with feedback to the centres

Evaluation by the Working Group
Presentation of the results to the RIZIV-INAMI structures

Possibility of audits with external (foreign) experts

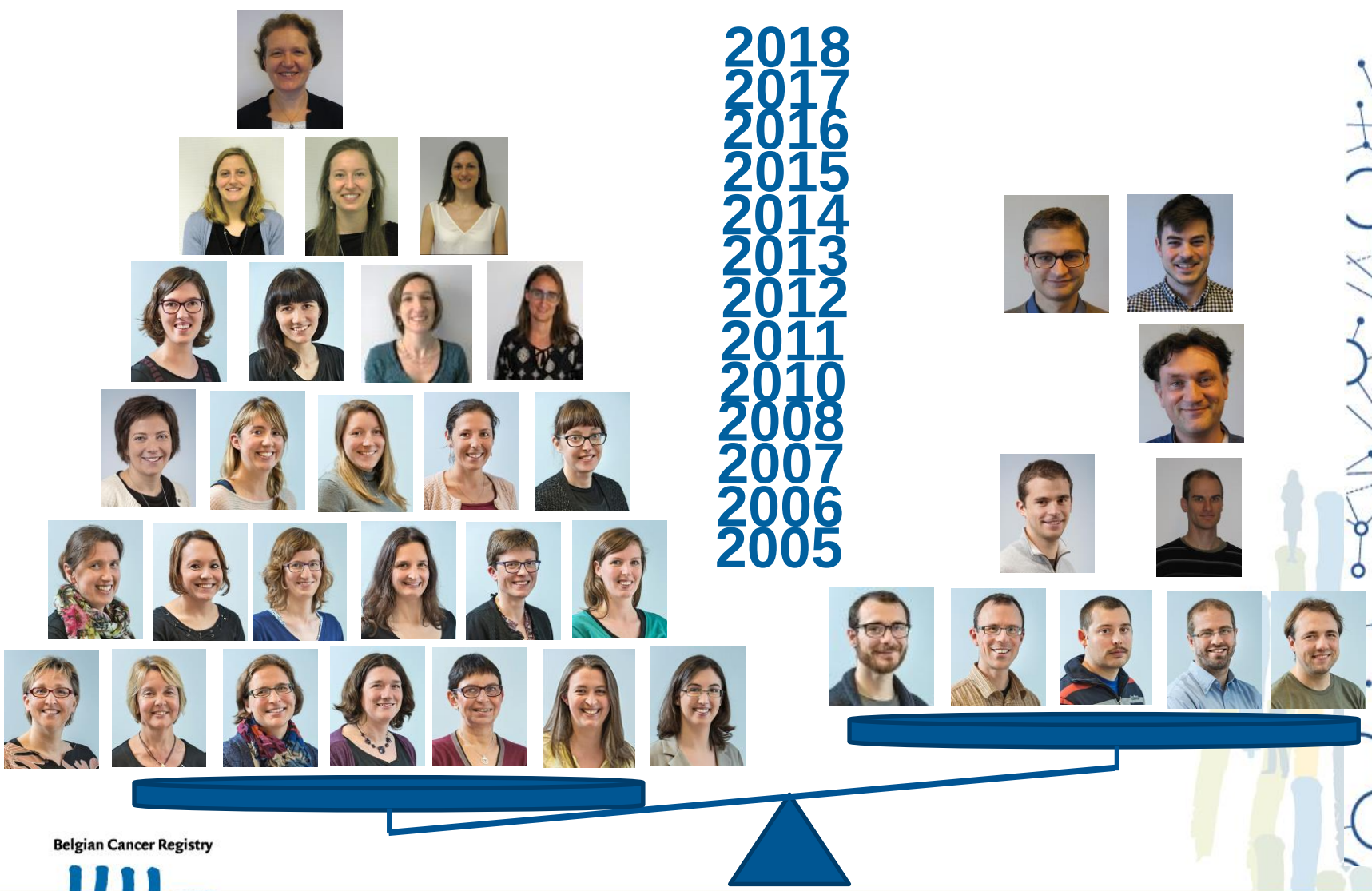
CONCLUSION

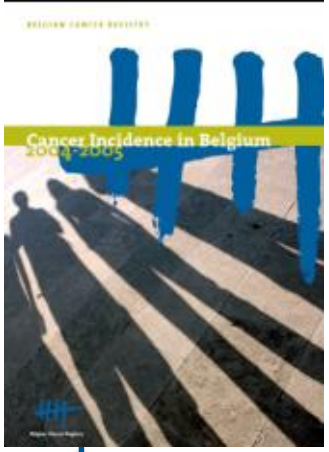
- Centralisation of oesphageal and pancreatic surgery: from evidence to practice in Belgium, an evolution over years.

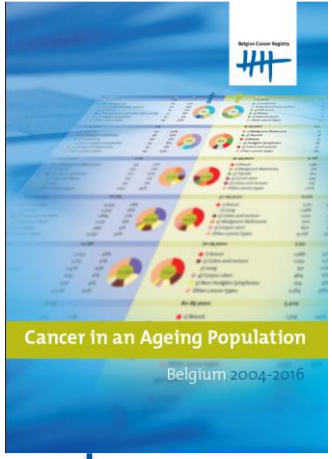
- Important realization
  - RIZIV-INAMI Conventions for 10 (oesophagus), 15 (pancreas) centres

- Follow-up over time needed
  - Documentation and registration
  - Peer review/audit…
- Future: other tumours? Head and neck?
- AND….

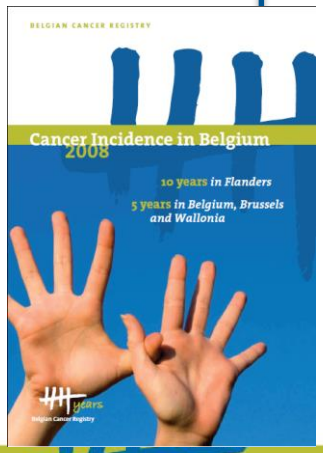
Thank you for your attention!

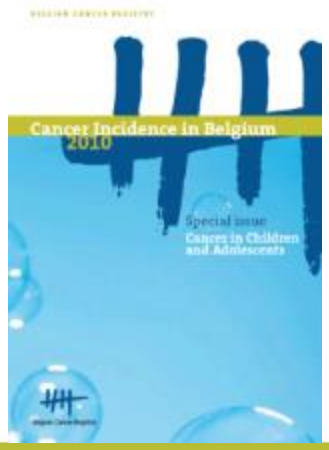


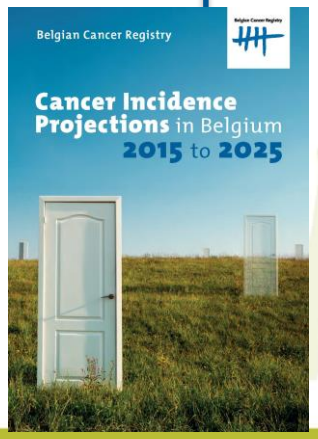




2008 2011 2012 2013 2014 2015 2016 2017 2018 2019

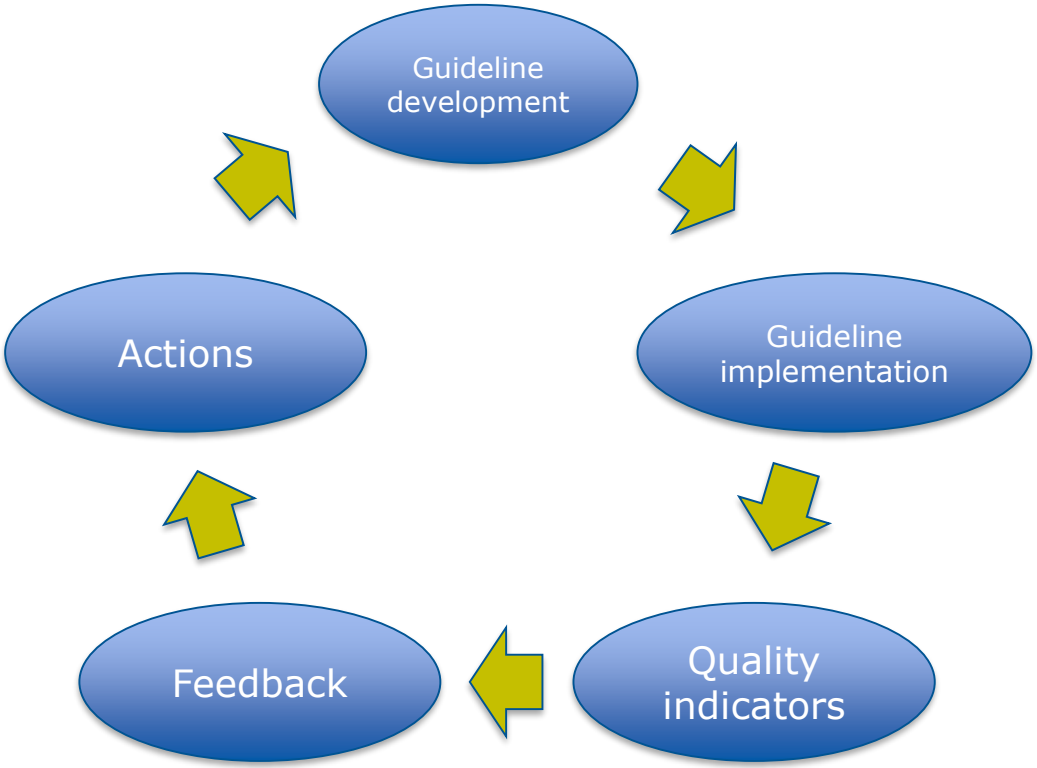






Measuring quality of care

An integrative quality system…



KCE report 152

Quality of care indicators

structure

process

outcome