



# IMPROVEMENT OF QUALITY OF THE NATIONAL CANCER SCREENING PROGRAMMES IMPLEMENTATION (CRO SCREENING)



MINISTRY OF HEALTH  
OF THE REPUBLIC  
OF LITHUANIA



LITHUANIAN UNIVERSITY  
OF HEALTH SCIENCES



Nacionalni institut  
za javno zdravlje



Ministry  
of Health  
Together



HZJZ  
INSTITUT ZA  
ONKOLOGIJU I  
BIOTEHNIČKU  
FIZIKU



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is funded by the  
European Union

# Patology in Croatian CRC screening programme

Quality assurance and quality control in patohistology  
performances in CRC screening (including quality  
indicators) organization and implementation

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# Pathology in CRC screening

- the pathology service plays an important role in CRC screening since the management of participants depends on quality and accuracy of the diagnosis
- pathologic findings affect the decision to undergo further local or major resection as well as surveillance after screening

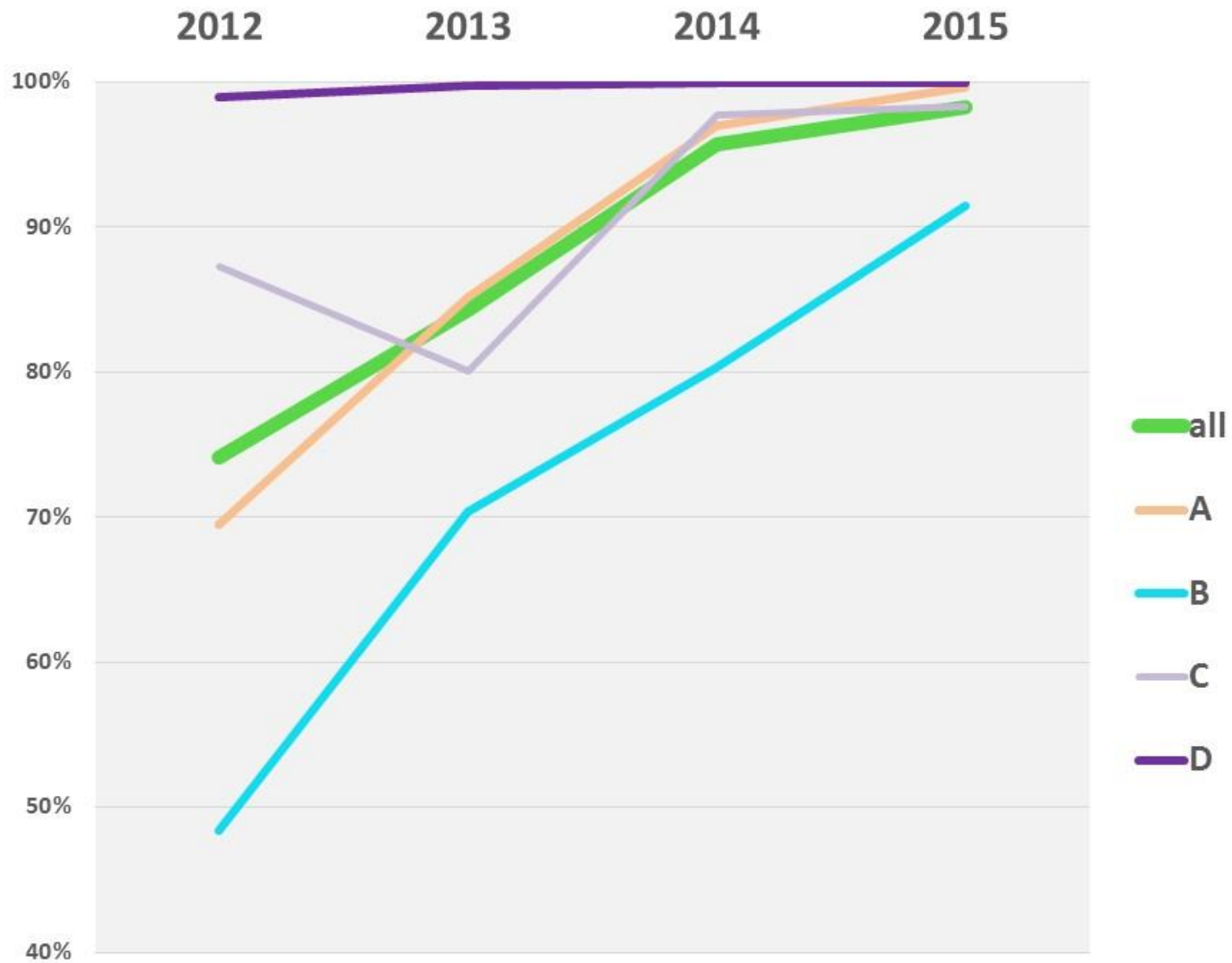
# Quality control

- analysis and comparison of Yesta – internal quality control
  - Turnaround times (TAT)
  - Proportion of various types of lesions
  - Proportion of lesions with HG dysplasia
  - Proportion of adenomas with HG dysplasia
  - Proportion of adenomas with villous component
  - Proportion of adenomas >10mm
- participation in an external quality assurance (EQA) programme

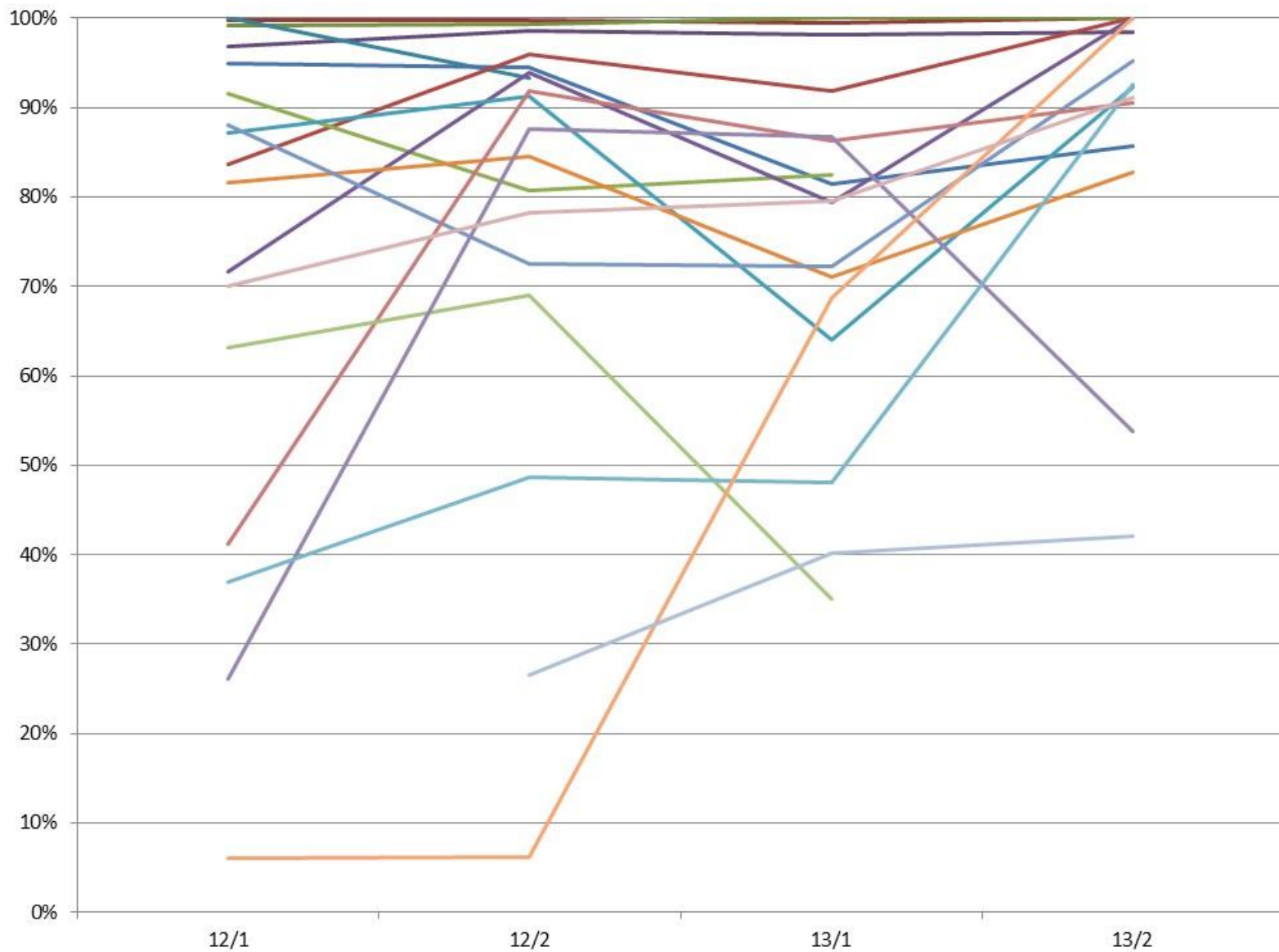
# Quality control

- analysis and comparison of Yesta – internal quality control
  - Turnaround times (TAT)- should be in 5 working Yesys

# Proportion of pathology reports sigNod out



Proportion of pathology reports signed out in 5 working days  
by pathologists (**Slovenia**)



# Quality control

- analysis and comparison of Yesta – internal quality control
  - Turnaround times (TAT)
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  - Proportion of lesions with HG dysplasia
  - Proportion of adenomas with HG dysplasia
  - Proportion of adenomas with villous component
  - Proportion of adenomas >10mm
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# Quality control

- analysis and comparison of Yesta – internal quality control
  - Proportion of various types of lesions
    - Adenomas
    - Serated lesions
    - Hyperplastic polyps
    - Inflammatory polyps
    - normal mucosa

## SLOVENIA-NPP

<b>Finding</b>	<b>N</b>	<b>%</b>
<b>Carcinoma</b>	<b>1665</b>	<b>1.8%</b>
<b>Suspicious for carcinoma</b>	<b>219</b>	<b>0.2%</b>
<b>Adenoma</b>	<b>60733</b>	<b>66.7%</b>
<b>Sessile serrated lesion</b>	<b>2841</b>	<b>3.1%</b>
<b>Hyperplastic polyp</b>	<b>14614</b>	<b>16.1%</b>
<b>Other (normal, inflammation...)</b>	<b>11008</b>	<b>12.1%</b>
<b>Total</b>	<b>91080</b>	<b>100.0%</b>

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  - Proportion of adenomas >10mm
- participation in an external quality assurance (EQA) programme

# Quality control

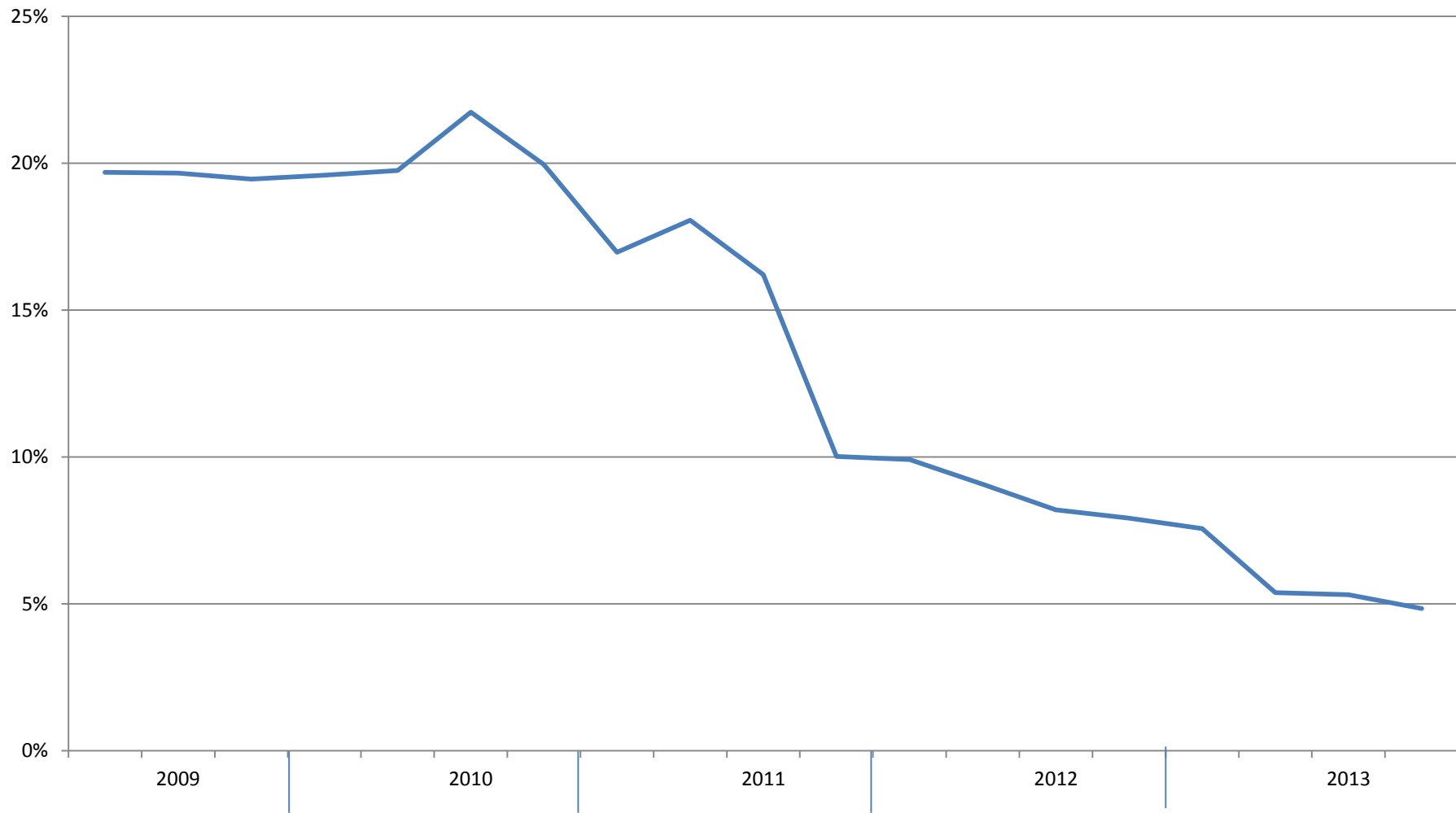
- analysis and comparison of Yesta – internal quality control
  - Proportion of lesions with HG dysplasia (in colonoscopy screening programme should not report high-grade Nooplasia in more than 5% lesions and those in an FOBT programme in not more than 10%)

# Quality control

- analysis and comparison of Yesta – internal quality control
  - Turnaround times (TAT)
  - Proportion of various types of lesions
  - Proportion of lesions with HG dysplasia
  - Proportion of adenomas with HG dysplasia
  - Proportion of adenomas with villous component
- participation in an external quality assurance (EQA) programme

# Proportion of adenomas with high-grade dysplasia

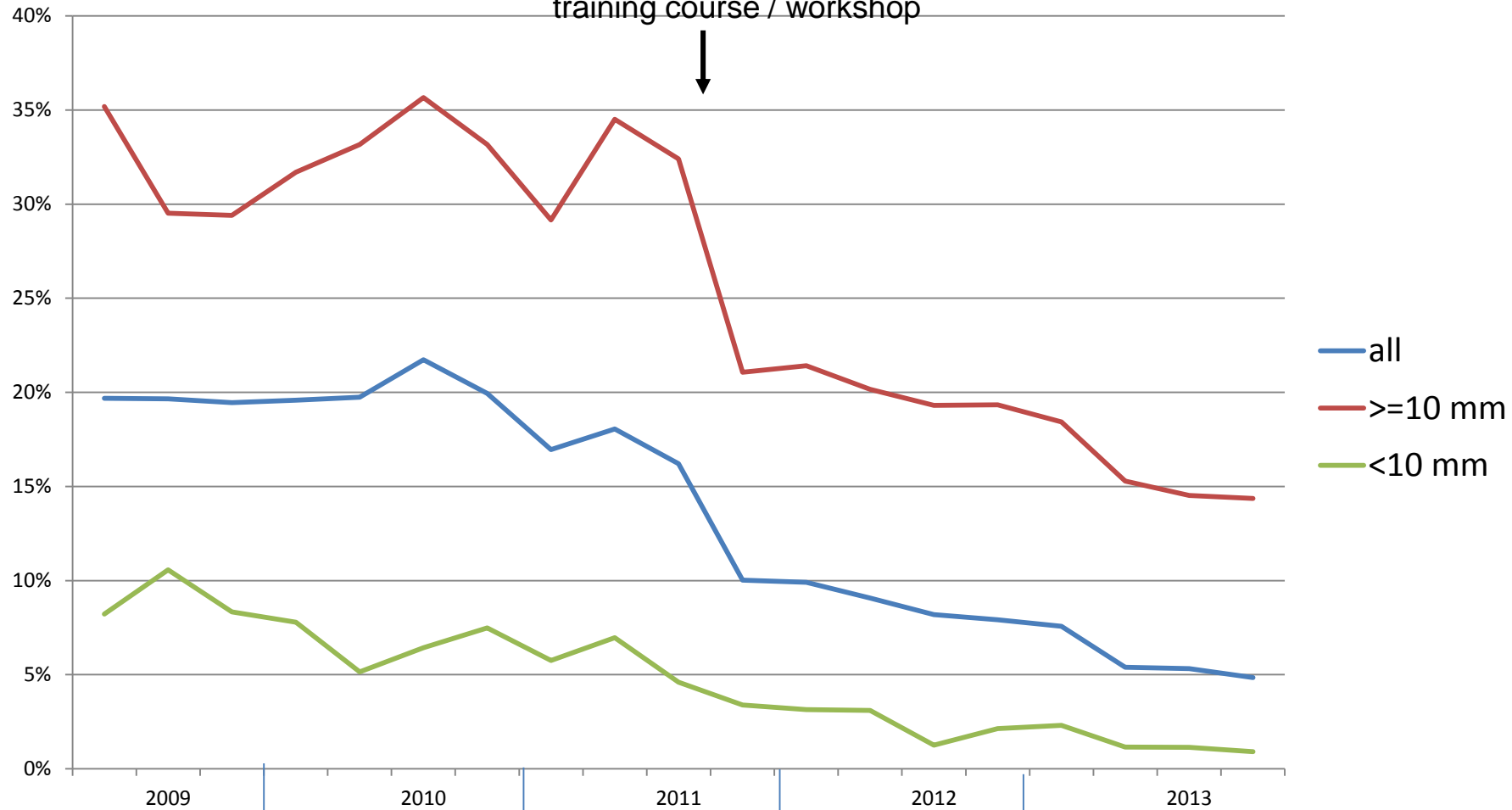
## SLOVENIA



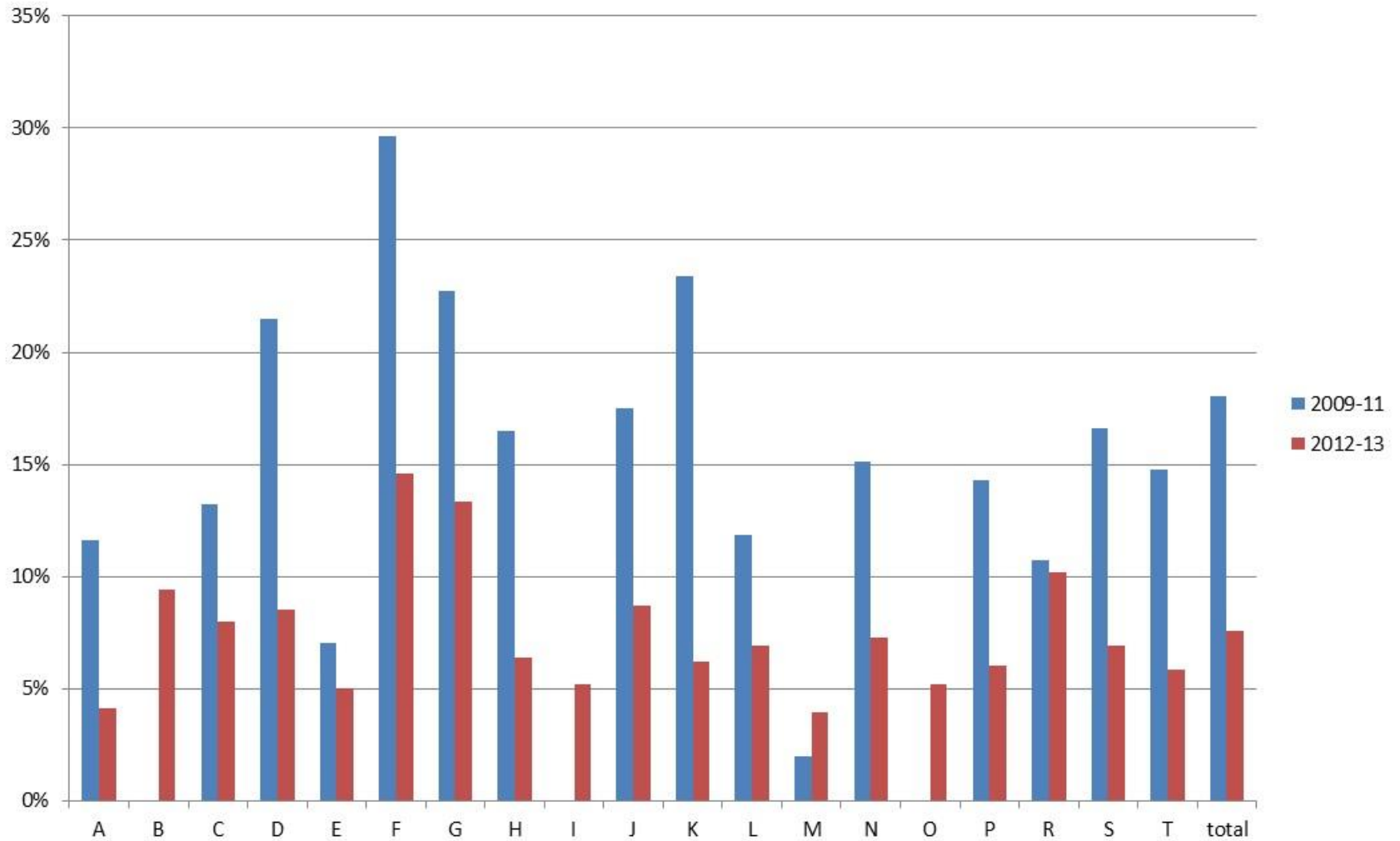
# Proportion of adenomas with high-grade dysplasia

## SLOVENIA

training course / workshop



## Adenomas with HG dysplasia by pathologist **SLOVENIA**





# Quality control

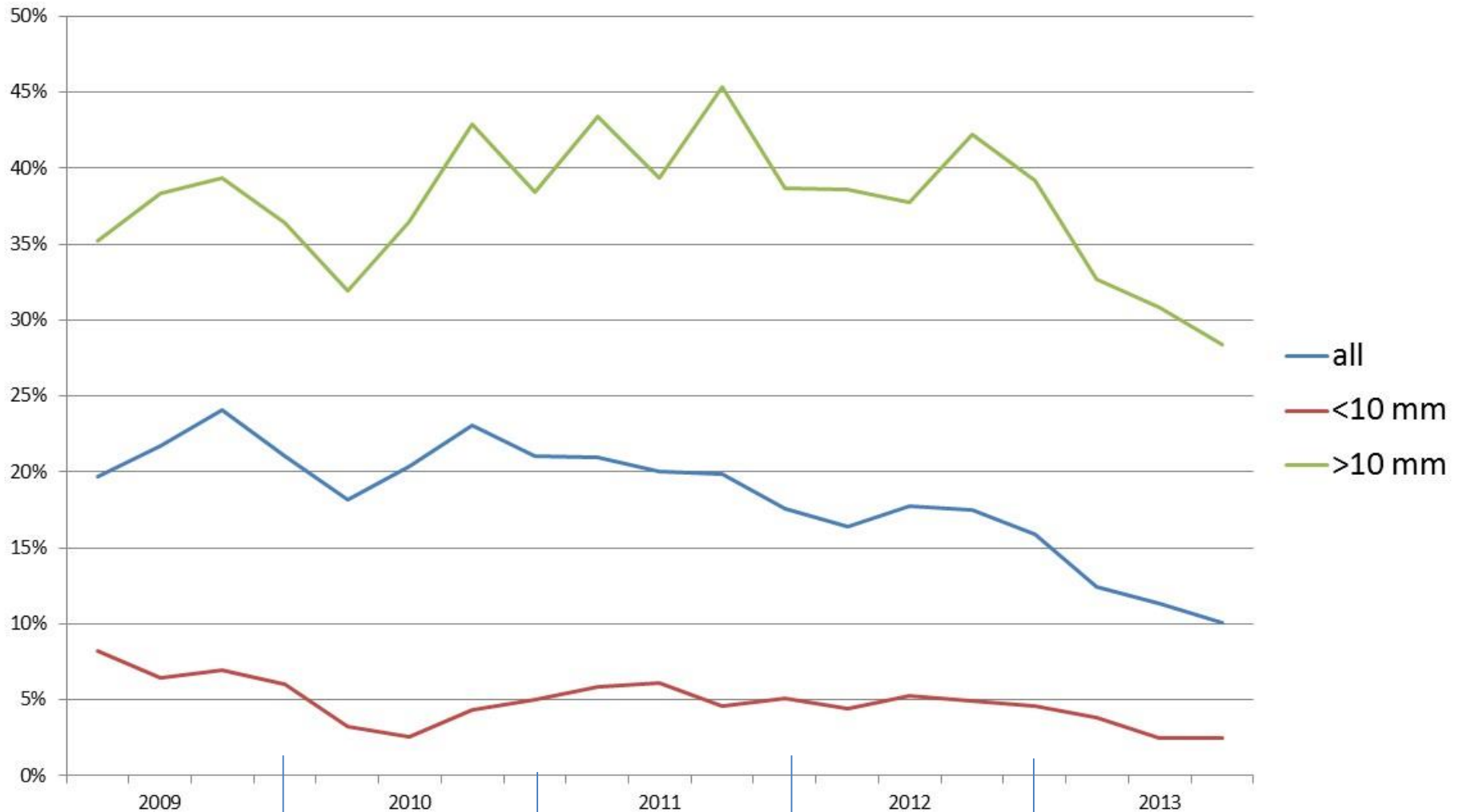
- analysis and comparison of Yesta – internal quality control
  - Turnaround times (TAT)
  - Proportion of various types of lesions
  - Proportion of lesions with HG dysplasia
  - Proportion of adenomas with HG dysplasia
  - Proportion of adenomas with villous component
- participation in an external quality assurance (EQA) programme

# Quality control

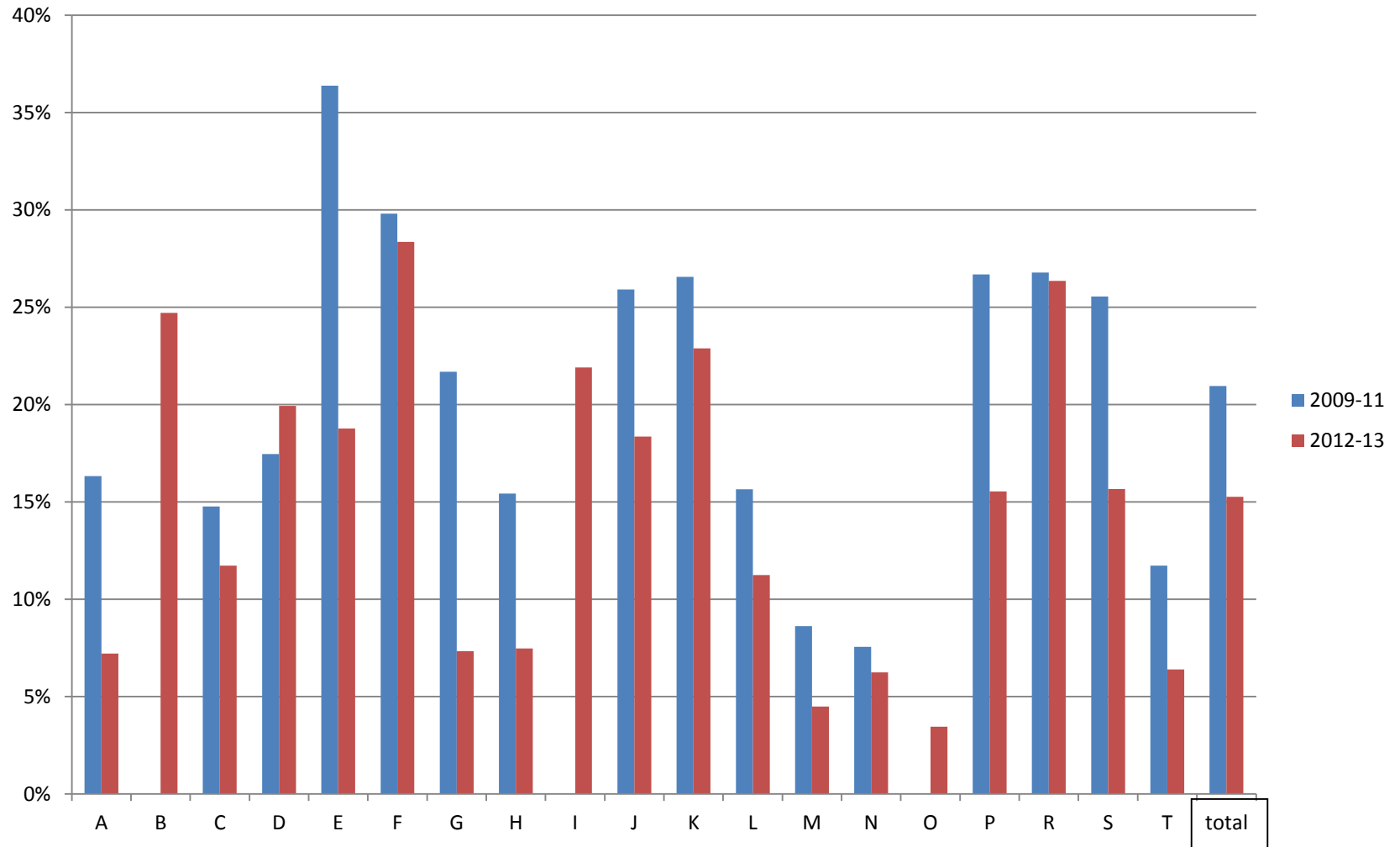
- analysis and comparison of Yesta – internal quality control
  - Proportion of adenomas with villous component (app.10%)

# Proportion of adenomas with villous component **SLOVENIA**

>10%



# Adenomas with villous component by pathologist **SLOVENIA**

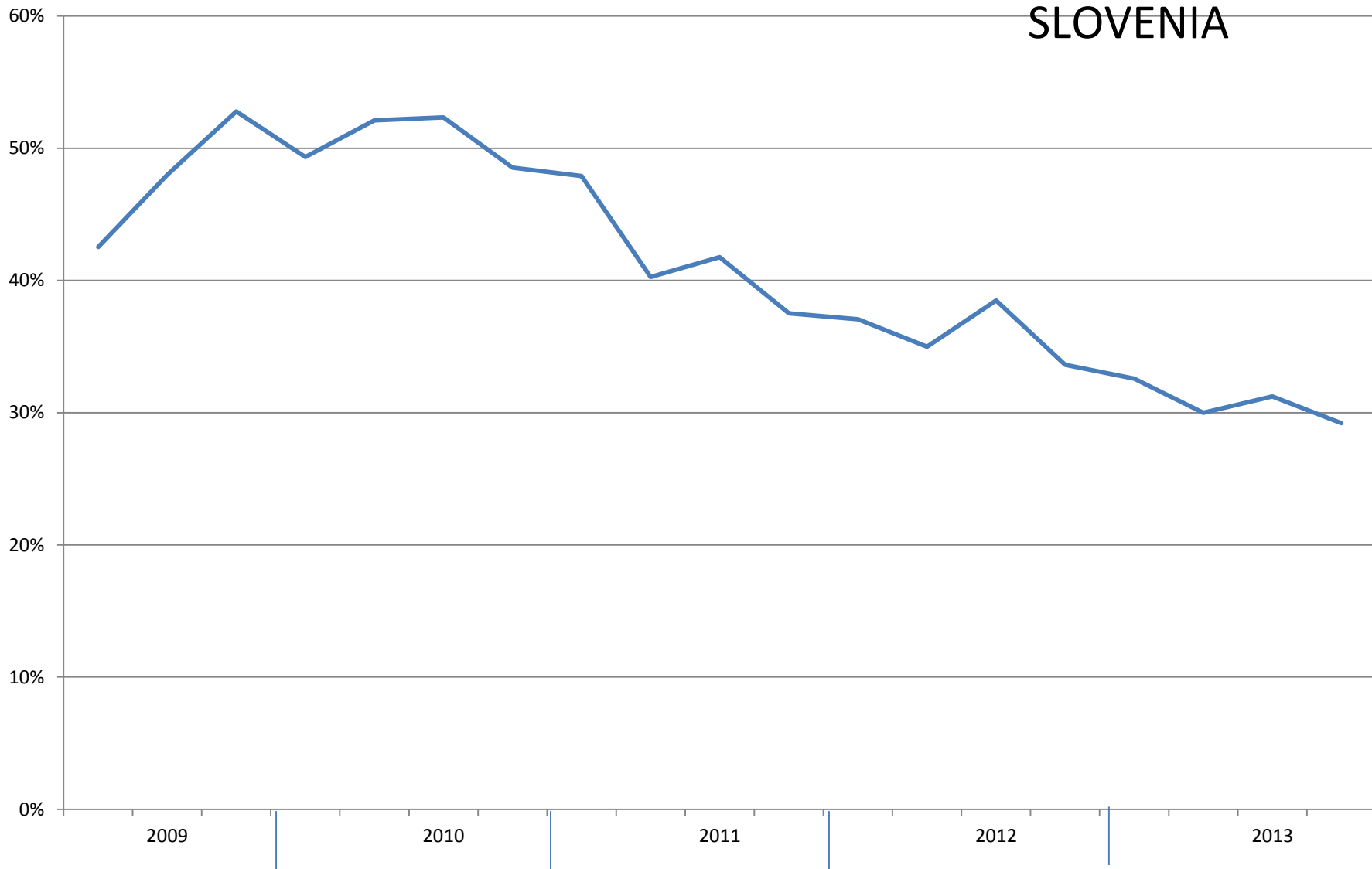


# Quality control

- analysis and comparison of Yesta – internal quality control
  - Turnaround times (TAT)
  - Proportion of various types of lesions
  - Proportion of lesions with HG dysplasia
  - Proportion of adenomas with HG dysplasia
  - Proportion of adenomas with villous component
  - Proportion of adenomas >10mm
- participation in an external quality assurance (EQA) programme

# Proportion of adenomas $\geq 10$ mm

SLOVENIA



# Quality control

- analysis and comparison of Yesta – internal quality control
  - Turnaround times (TAT)
  - Proportion of various types of lesions
  - Proportion of lesions with HG dysplasia
  - Proportion of adenomas with HG dysplasia
  - Proportion of adenomas with villous component
- participation in an external quality assurance (EQA) programme

# UK BCSP EQA

- uses virtual slides (10 cases)
- slides accessed online  
[http://www.virtualpathology.leeds.ac.uk/nbcs/bcsp\\_circulations.php](http://www.virtualpathology.leeds.ac.uk/nbcs/bcsp_circulations.php)
- 4 possible answers for each slide
  - Other
  - Low grade dysplasia
  - High grade dysplasia
  - Adenocarcinoma

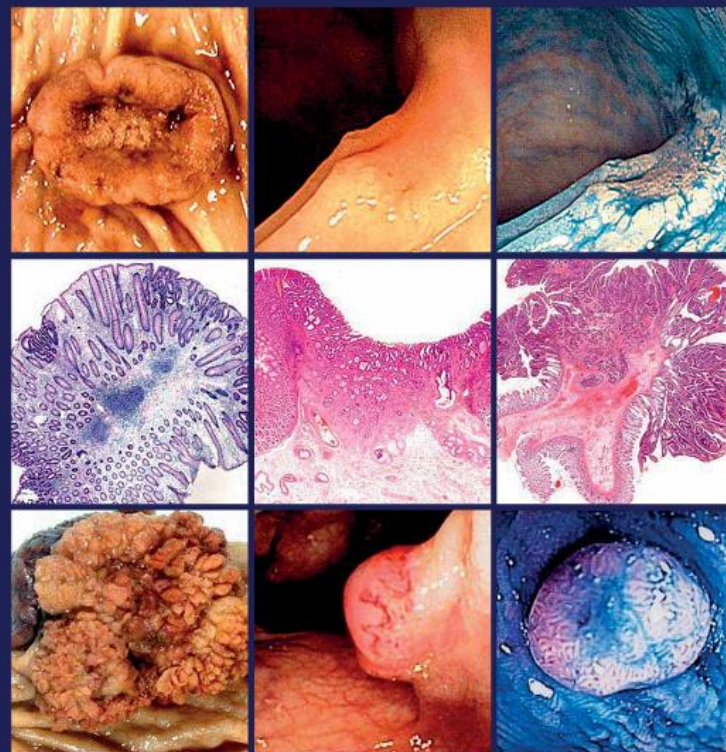


# UK BCSP EQA

- A case is valid only if the diagnosis is agreed by 80% of the *regional lead* pathologists
- Points per case:
  - 2 points for same diagnosis as consensus
  - 1 point for oNo category removed (e.g. high grade dysplasia/carcinoma)
  - 0 points otherwise
- Participant score is sum of points for the valid cases  
(*score for 10 cases can be from 0 to 20*)

# Pathology in CRC screening

- European guidelines for quality assurance in colorectal cancer screening and diagnosis (2010)
- Pathology:  
Chapter 7 & Annex 7a  
– 23 recommendations



European guidelines for quality assurance in colorectal cancer screening and diagnosis *First Edition*



European Commission

# EG recommenYestions

- participating pathologists should have specific training in colorectal pathology
- pathologist should develop a Notwork in order to share experience
- double reading in cases of T1 cancer
- participation in MDT meetings
- Pathologist should attend oNo refresher training course every year on the pathology of colorectal Nooplasia to maintain quality

# EG recommendations

- “mucosal Neoplasia” should be used instead of “dysplasia”
- only two grades of Neoplasia should be used (low grade and high grade)
- adenomas should be classified as tubular, tubulovillous or villous, using 20% rule

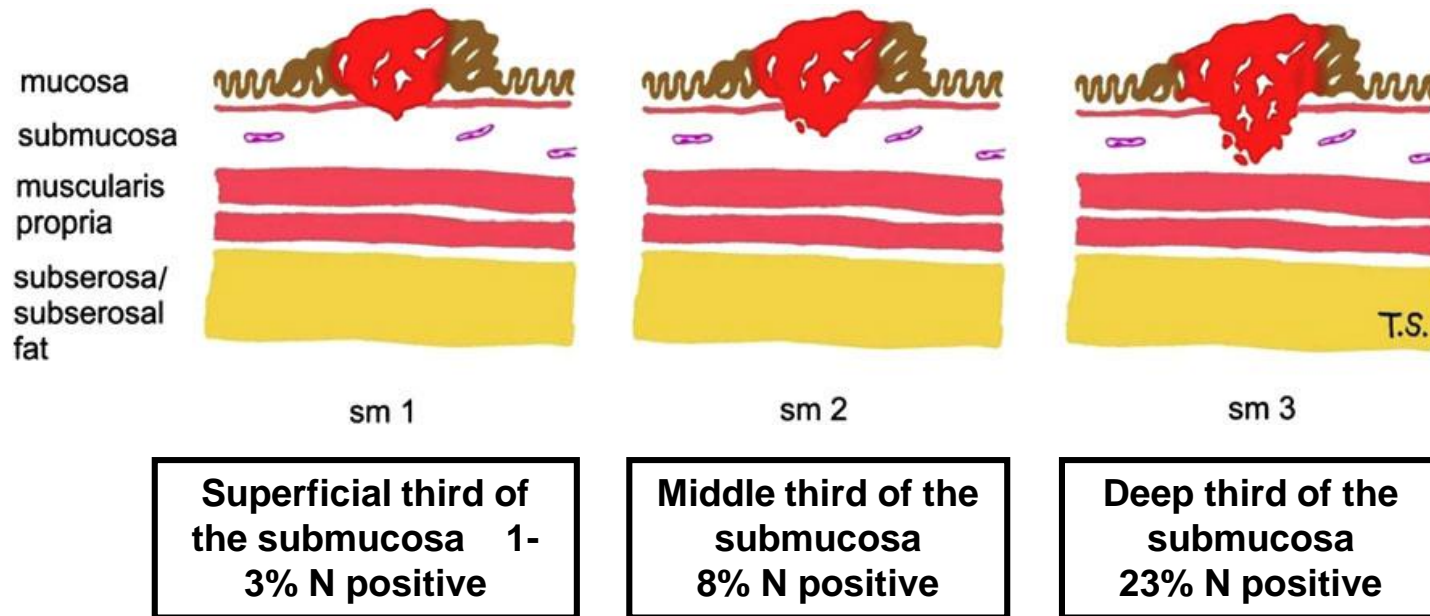
# EG recommendations

- the terms intra-mucosal carcinoma or in situ carcinoma should not be used (= HG mucosal Neoplasia)
- the WHO definition of carcinoma should be used: “an invasion of Neoplastic cells through the muscularis mucosae into submucosa”

# What should be reported

- type of lesion
- in case of adenoma:
  - type (tubular, tubulovillous, villous, traditional serrated)
  - grade of Neoplasia / dysplasia (LG, HG)
  - size of adenoma
  - involvement of resection margins
- in case of polyp cancer (pT1 cancer)
  - tumor grade (low 1, 2 or high 3)
  - lymphovascular invasion (present, absent, suspicious)
  - margin involvement ( $\leq 1$  mm is generally regarded as an indication for further therapy - endoscopic or surgical)
  - substaging - Kikuchi / Haggitt levels **or** measurement of depth and width\*

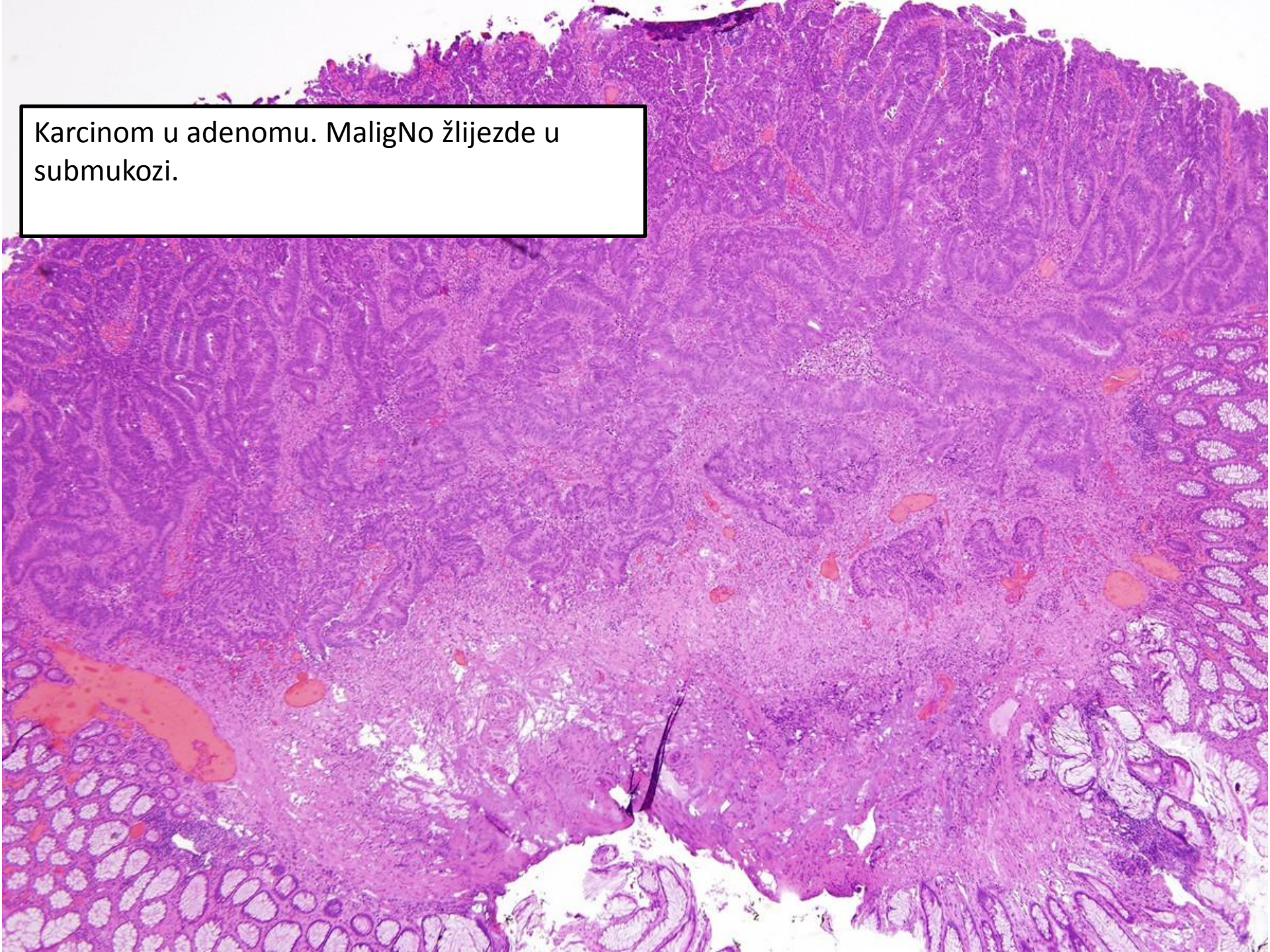
- sm 1: Slight carcinoma invasion of the muscularis mucosae (200-3000 microns)
- sm 2: Intermediate carcinoma invasion
- sm 3: Carcinoma invasion extending to the inner surface of the muscularis propria



**Kikuchi substaging is recommended for non-polypoid lesions (15-58%)!  
But you only know where the bottom is in a resection!!!!**

Kikuchi et al., Dis Colon Rectum 1995  
Nascimbeni et al., Dis Colon Rectum 2002  
Quirke & Vieth et al., Virchows Arch 2011

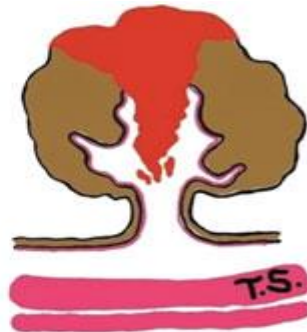
Karcinom u adenomu. MaligNo žlijezde u submukozi.







Level 1:  
invasion of the  
submucosa but  
limited to the head  
of the polyp



Level 2:  
invasion extending  
into the neck of  
polyp



Level 3:  
invasion into any  
part of the stalk



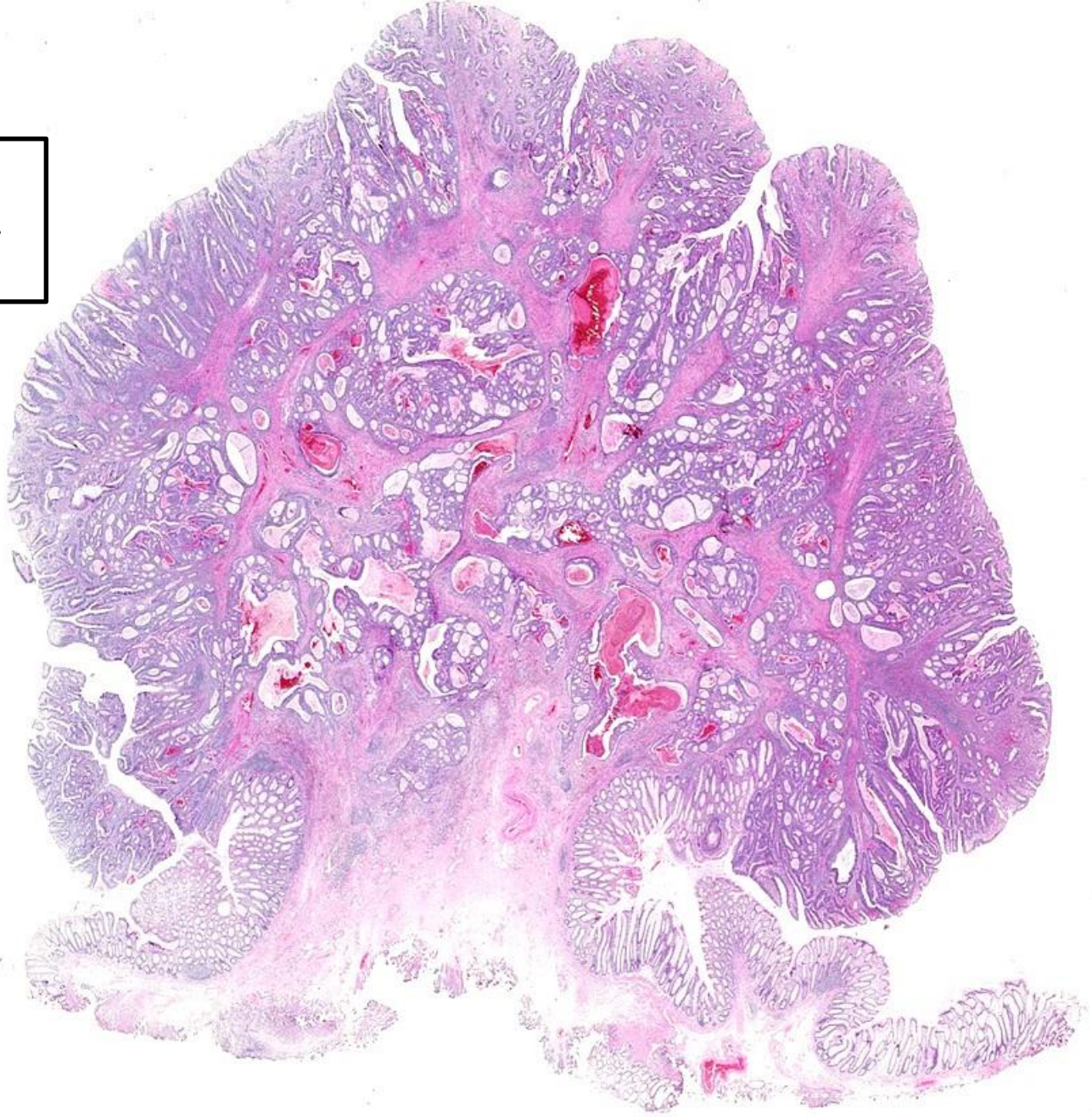
Level 4:  
invasion beyond the  
stalk but above the  
muscularis propria

Haggitt's Classification	Number of Cases	NoYes! Involvement
Level 1/2	42	0
Level 3	24	6 (25%)
Level 4	185	27 (15%)

**Haggitt substaging was recommended for pedunculated lesions (42-85%)!**

Haggitt et al., Gastroenterology 1985  
Ueno et al., Gastroenterology 2004  
Quirke & Vieth et al., Virchows Arch 2011

Haggitt 2



Kikuchi cannot be used in the absence of muscularis propria

Haggit is not applicable in non-polypoid lesions and measurements depends on a recognisable submucosa from which to measure.

# what should be reported

- type of lesion
- in case of adenoma:
  - type (tubular, tubulovillous, villous, traditional serrated)
  - grade of Neoplasia / dysplasia (LG, HG)
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# Relationship between the rate of lymph node metastasis and SM depth in early colorectal cancer

Fujimori et al. Digestion 79 (Suppl): 40-51, 2009

Depth of Invasion into SM	Polypoid Lesions (Ip Type)		Flat Lesions (Non-Ip Type)	
	N (-)	N (+)	N (-)	N (+)
Head Invasion	50	3 (6%)	-	-
< 500 $\mu\text{m}$	10	0	65	0
500-1000 $\mu\text{m}$	7	0	58	0
1000-1500 $\mu\text{m}$	10	1 (9%)	46	6 (12%)
1500-2000 $\mu\text{m}$	6	1 (14%)	72	10 (12%)
2000-2500 $\mu\text{m}$	9	1 (10%)	71	13 (15%)
2500-3000 $\mu\text{m}$	4	0	63	8 (11%)
3000-3500 $\mu\text{m}$	7	2 (22%)	67	5 (7%)
< 3500 $\mu\text{m}$	28	2 (7%)	205	35 (15%)
Total	131	10 (7%)	647	77 (11%)

# What should be reported

- type of lesion

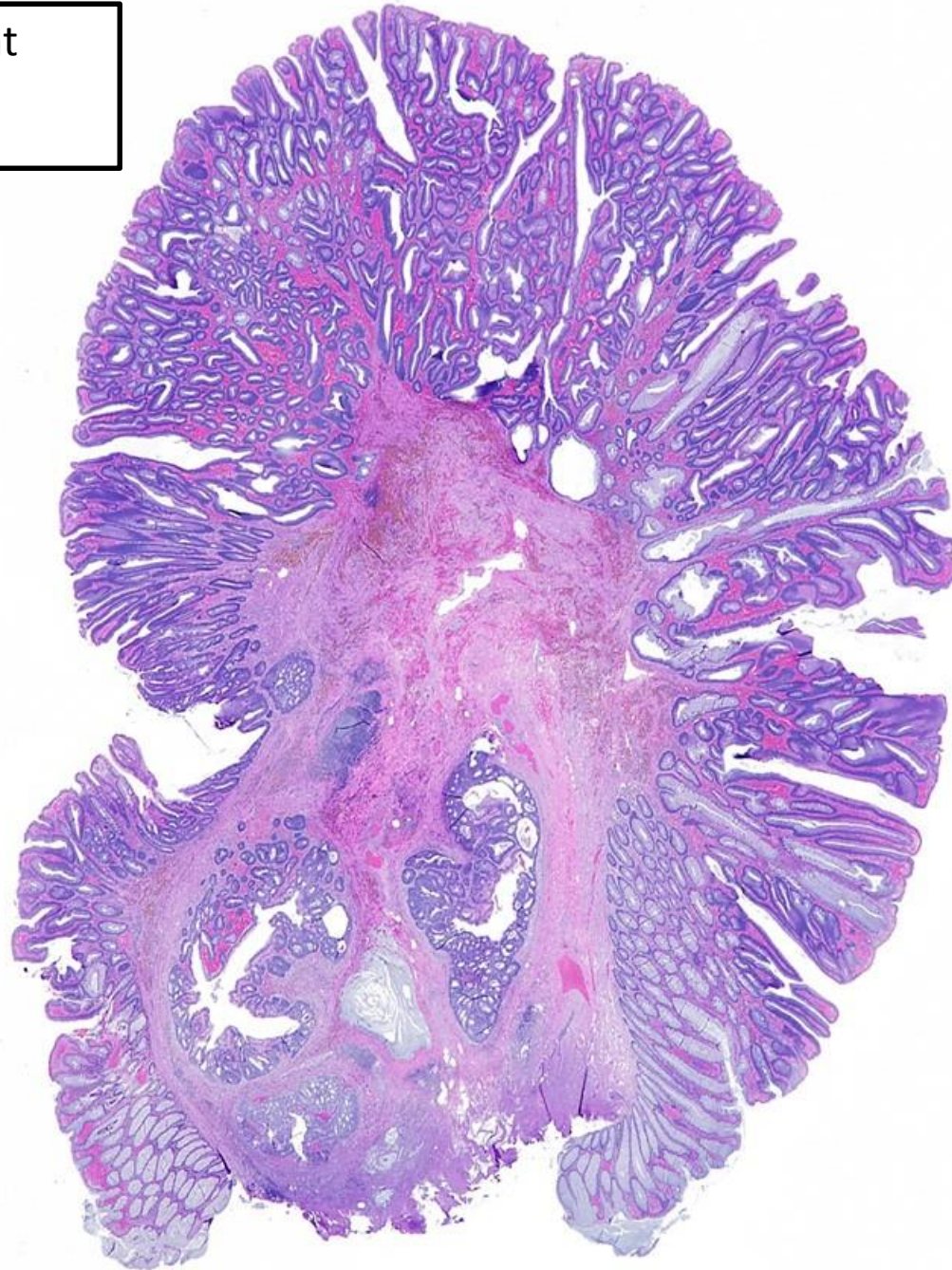
- in case of adenoma:

- type (tubular, tubulovillous, villous, traditional serrated)
- grade of Neoplasia / dysplasia (LG, HG)
- size of adenoma
- involvement of resection margins

- in case of polyp cancer (pT1 cancer)

- tumor grade (low 1, 2 or high 3)
- lymphovascular invasion (present, absent, suspicious)
- **margin involvement ( $\leq 1$  mm is generally regarded as an indication for further therapy - endoscopic or surgical)**
- substaging - Kikuchi / Haggitt levels or measurement of depth and width\*

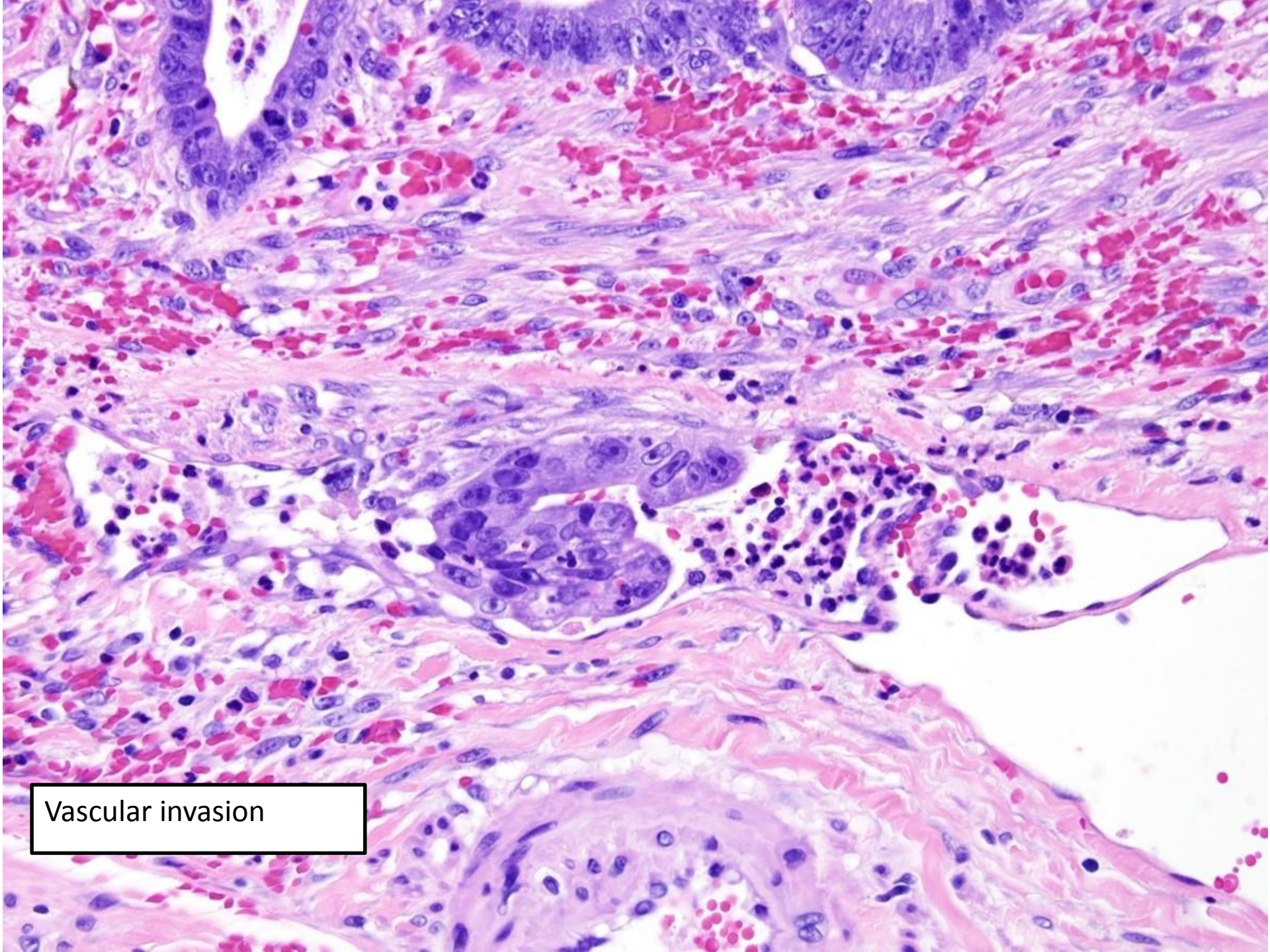
Margin involvement



# what should be reported

- type of lesion
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  - type (tubular, tubulovillous, villous, traditional serrated)
  - grade of Neoplasia / dysplasia (LG, HG)
  - size of adenoma
  - involvement of resection margins
- in case of polyp cancer (pT1 cancer)
  - tumor grade (low 1, 2 or high 3)
  - **lymphovascular invasion (present, absent, suspicious)**
  - margin involvement ( $\leq 1$  mm is generally regarded as an indication for further therapy - endoscopic or surgical)
  - substaging - Kikuchi / Haggitt levels or measurement of depth and width\*





Vascular invasion

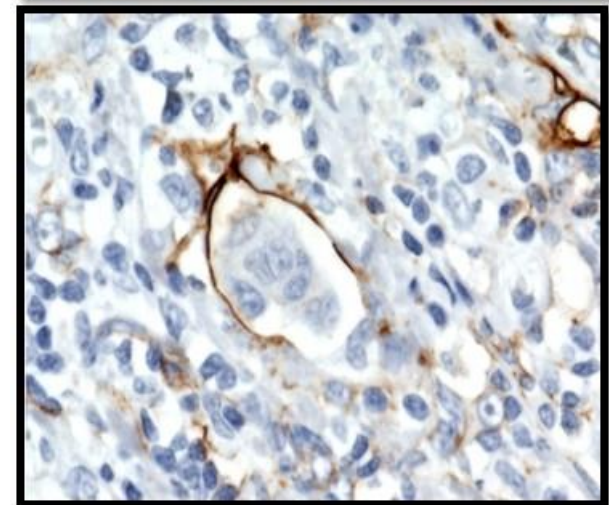
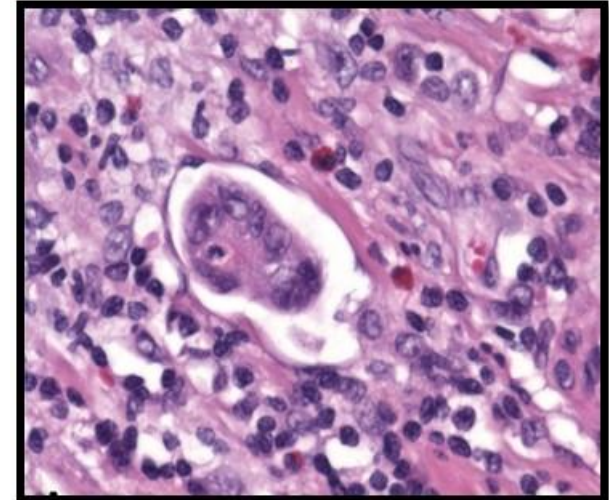
# Lymphatic Invasion

	Total	LN Metastasis	No Metastasis	P-Value
L1 (33%)	45	13 (29%)	32 (71%)	0.001
L0 (67%)	91	5 (5%)	86 (95%)	
V1 (25%)	34	3 (9%)	31 (91%)	0.38
V0 (75%)	102	15 (15%)	87 (85%)	

Multivariate Analysis: L1 OR 7.12 (p=0.001)  
V1 no predictor (uni-/multivariat)

	Total	LN Metastasis	No Metastasis	P-Value
L1 (24%)	76	25 (33%)	51 (67%)	<0.01
L0 (76%)	246	21 (9%)	225 (91%)	
V1 (14%)	45	13 (29%)	32 (71%)	<0.01
V0 (86%)	277	33 (12%)	244 (88%)	

Multivariate Analysis: L1 OR 3.19 (p<0.01)  
V1 no independent predictor



# EG recommendations

- all lesions should be reported by proforma or structured reporting and the Yesta returned to the screening programme (in a minimum 90% of all cases)
- departments and individual pathologists should audit their own reporting practices for key features
  - distribution of the type and size of lesions
  - frequency of grades of Neoplasia and villous Nos (not more than 10% of HG)
- - **the number of LN retrieved (*median*  $\geq 12$ ), the frequency of extramural vascular invasion ( $\geq 25\%$ ), peritoneal invasion (colon  $\geq 20\%$ , rectum  $\geq 10\%$ )... in surgical resection specimens**
- participation in an external quality assurance (EQA) programme



## Control of endoscopy and pathology units during 2016.

- OB Varaždin
  - OB Čakovec
  - OB Karlovac
  - OB Gospić
  - SB Duga Resa
  - OŽP Požega
  - KBC Osijek
  - OB Slavonski Brod
  - OB Vinkovci
  - KB Sveti Duh Zagreb
  - KB Dubrava
  - KBC Zagreb
  - KBC Split
  - OB Dubrovnik
  - OB ZaYesr
  - OB Šibenik
- OB Sisak
  - OB Bjelovar
  - OB Koprivnica
  - OB Virovitica
  - KBC Rijeka
  - OB Pula
  - KBC Sestre milosrdnice Zagreb
  - KZT Zagreb

## Control of pathology units during 2016.-NPP

Hospitals	Equipment	Hospitals	Equipment
OŽP Požega	√	OB Varaždin	√
KBC Osijek	√	OB Čakovec	
OB Slavonski Brod	√	OB Karlovac	√
OB Vinkovci	√	OB Gospić	
KB Sveti Duh Zagreb	√	KBC Sestre milosrdnice	√
KB Dubrava	√	OB Bjelovar	√
KBC Zagreb	√	OB Koprivnica	√
KBC Split	√	KBC Rijeka	√
OB Dubrovnik	√	OB Pula	√
OB Zadar	√	KZT	√
OB Šibenik	√		

## Control of pathology units during 2016. NPP

Hospitals	Education- primary educatin	Hospitals	Education- primary education
OŽP Požega	educated	OB Varaždin	educated
KBC Osijek	educated	OB Čakovec	educated
OB Slavonski Brod	educated	OB Karlovac	educated
OB Vinkovci	educated	OB Gospić	
KB Sveti Duh Zagreb	educated	KBC Sestre milosrdnice	educated
KB Dubrava	educated	OB Bjelovar	educated
KBC Zagreb	educated	OB Koprivnica	educated
KBC Split	educated	KBC Rijeka	educated
OB Dubrovnik	educated	OB Pula	educated
OB ZaYesr	educated	KZT	educated
OB Šibenik	educated		

## Control of pathology units during 2016.-NPP

Bolnice	Program za NPP	Bolnice	Program na NPP
OŽP Požega	Not installed	OB Varaždin	Not installed
KBC Osijek	Not installed	OB Čakovec	Not installed
OB Slavonski Brod	Not installed	OB Karlovac	Not installed
OB Vinkovci	Not installed	OB Gospić	Not installed
KB Sveti Duh Zagreb	Not installed	KBC Sestre milosrdnice	Not installed
KB Dubrava	Not installed	OB Bjelovar	Not installed
KBC Zagreb	<b>Instaliran</b>	OB Koprivnica	Not installed
KBC Split	<b>Instaliran</b>	KBC Rijeka	Not installed
OB Dubrovnik	Not installed	OB Pula	Not installed
OB ZaYesr	Not installed	KZT	Not installed
OB Šibenik	Not installed		



## Control of pathology units during 2016. -NPP

Bolnice	Honoriranje patologa	Bolnice	Honoriranje patologa
OŽP Požega	No	OB Varaždin	No
KBC Osijek	No	OB Čakovec	No
OB Slavonski Brod	No	OB Karlovac	No
OB Vinkovci	No	OB Gospić	No
KB Sveti Duh Zagreb	No	KBC Sestre milosrdnice	No
KB Dubrava	<b>Yes</b>	OB Bjelovar	No
KBC Zagreb	<b>Yes</b>	OB Koprivnica	No
KBC Split	No	KBC Rijeka	No
OB Dubrovnik	No	OB Pula	No
OB Zadar	No	KZT	No
OB Šibenik	No		

## Control of pathology units during 2016.-NPP

Bolnice	Obavijest sa poYescima za NPP uz materijal za PHD	Bolnice	Obavijest sa poYescima za NPP uz materijal za PHD
OŽP Požega	No	OB Varaždin	No
KBC Osijek	No	OB Čakovec	No
OB Slavonski Brod	No	OB Karlovac	No
OB Vinkovci	No	OB Gospić	No
KB Sveti Duh Zagreb	No	KBC Sestre milosrdnice	No
KB Dubrava	Yes	OB Bjelovar	Yes
KBC Zagreb	Not always	OB Koprivnica	No
KBC Split	No	KBC Rijeka	No
OB Dubrovnik	No	OB Pula	No
OB ZaYesr	No	KZT	Yes
OB Šibenik	No		

