

IFCT 0302

Chest CT scan+CXR versus CXR For follow up

Dr Virendra Kumar
Associate Professor, Thoracic Surgery
TMH, Mumbai



Concept

- Need for follow up?
- Diagnose-
 - Recurrence at earlier stage
 - Second primary
- Methods-
 - History and physical examination/CXR/ CT scan/ Bronchoscopy

Recurrence pattern



NIH Public Access

Author Manuscript

Surg Oncol. Author manuscript; available in PMC 2014 August 13.

Published in final edited form as:

Surg Oncol. 2013 September ; 22(3): 156–161. doi:10.1016/j.suronc.2013.04.002.

Local recurrence following lung cancer surgery: Incidence, risk factors, and outcomes

David Fedor*, W. Rainey Johnson, and Sunil Singhal**

Thoracic Surgery Research Laboratory, Department of Surgery, Perelman School of Medicine, 6 White Building 3400 Spruce Street, Philadelphia, PA, USA

Post-excision local recurrence rate (%) by lung cancer stage.

Study	Stage				
	IA	IB	IIA	IIB	IIIA
Choi 2011 ^{a,16}	4	7	11	12	24
Saynak 2010 ^{b,11}	19	19	27	27	38–40
Pisters 2005 ¹⁵	10	10	N/A	12	15

Likelihood of local recurrence following lung cancer surgery.

Author	Year	Number of patients	Percent of patients recurring (n)	Percent of patients with initial recurrence purely local (n)	Percent of patients with initial recurrence mixed (n)	Percent of patients with any initial local recurrence (n)
Taylor ⁵	2012	1143	33 (378)	8 (94)	None listed	8 (94)
Saynak ¹¹	2010	335	33 (111)	12 (41)	12 (41)	24 (82)
Kelsey ⁹	2009	975	26 (250)	7 (63)	8 (78)	15 (141)
Hung ¹³	2009	933	31 (289)	8 (74)	5 (49)	13 (123)
Nakagawa ^{a,12}	2008	397	22 (87)	7 (30)	None listed	7 (30)
Sugimura ¹⁰	2007	1073	36 (390)	7 (79)	6 (62)	13 (141)
Martini ^{a,7}	2005	598	27 (159)	5 (32)	None listed	5 (32)

This table lists local recurrence information from seven select studies. Percentages have been rounded to the nearest whole number.

Recurrence Pattern

Differences in Patterns of Recurrence in Early-Stage Versus Locally Advanced Non-Small Cell Lung Cancer

Feiran Lou, MD, MS, Camelia S. Sima, MD, MS, Valerie W. Rusch, MD, David R. Jones, MD, and James Huang, MD, MS

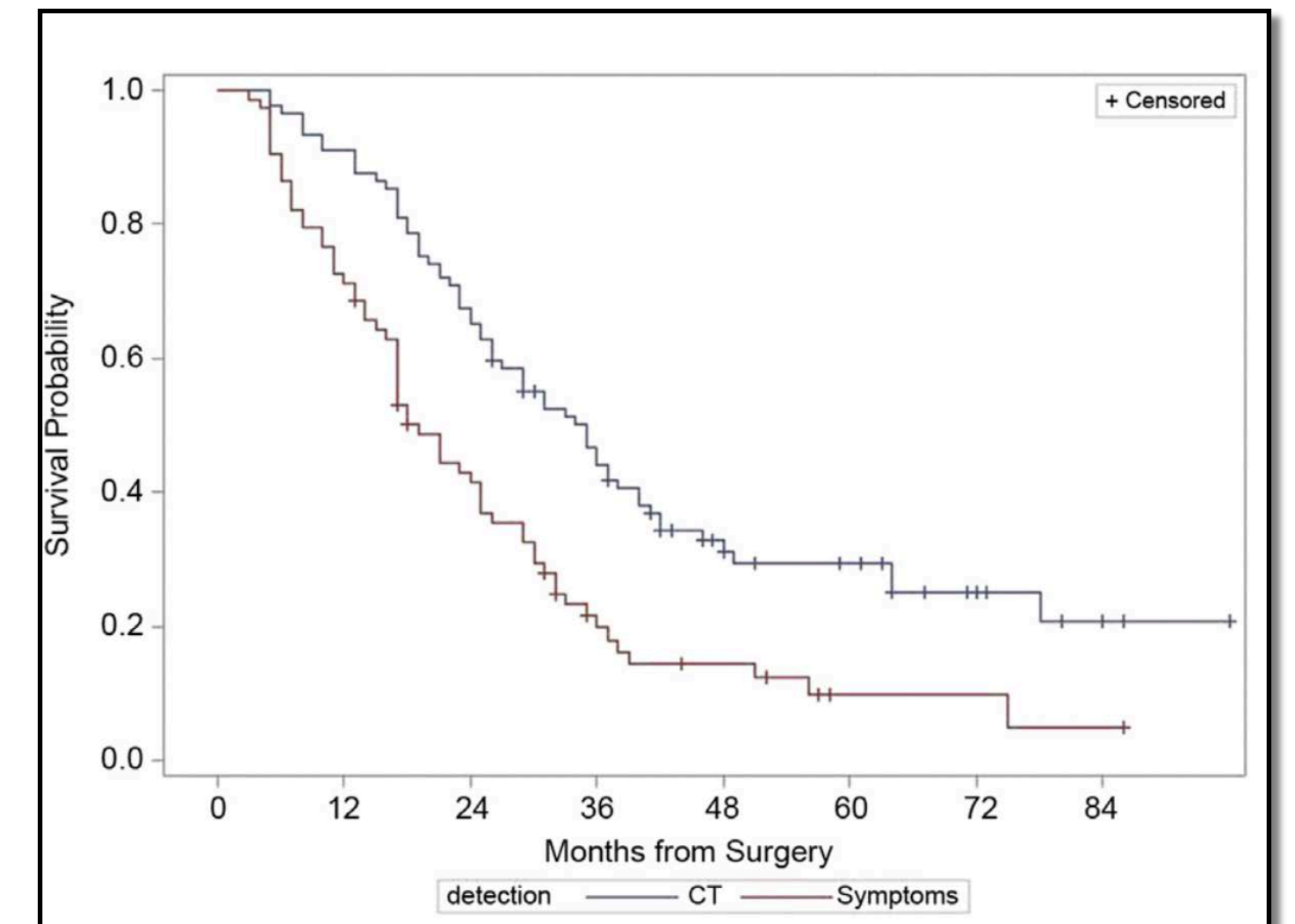
Department of Surgery, SUNY Downstate Medical Center, Brooklyn; Department of Epidemiology and Biostatistics, Biostatistics Service, and Department of Surgery, Thoracic Service, Memorial Sloan Kettering Cancer Center, New York, New York

Median follow up 35 months

In stage IIIA-
52% developed recurrence, 85% were distant, and by **CT surveillance-49%**

In early stage-
20% developed recurrence and 74% were distant, by **CT surveillance- 61%**

Survival was better in CT detected recurrences compared to symptomatic



Follow up strategy

European Journal of Cardio-Thoracic Surgery 49 (2016) 1624–1631
doi:10.1093/ejcts/ezv462 Advance Access publication 19 January 2016

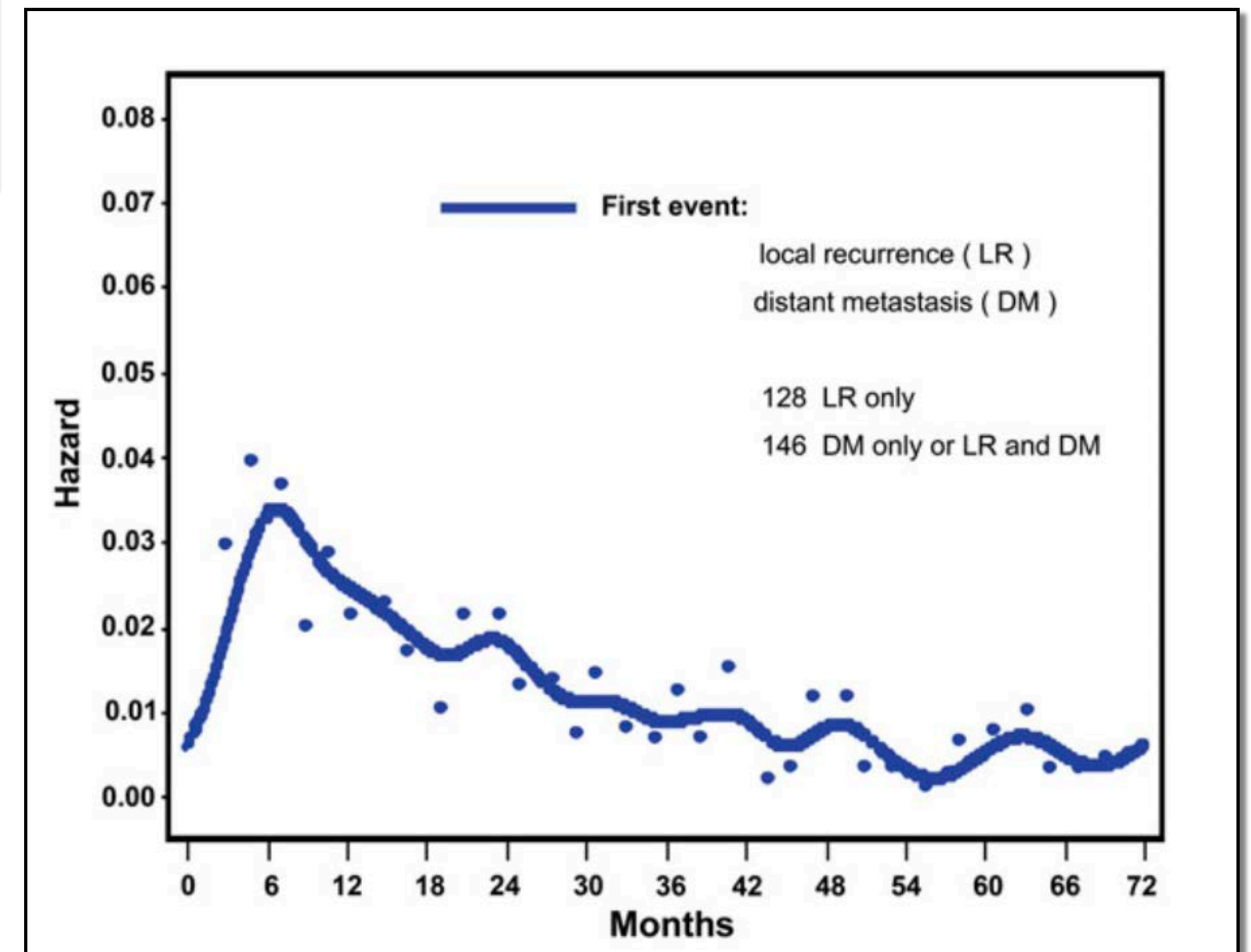
ORIGINAL ARTICLE

Cite this article as: Watanabe K, Tsuboi M, Sakamaki K, Nishii T, Yamamoto T, Nagashima T *et al.* Postoperative follow-up strategy based on recurrence dynamics for non-small-cell lung cancer. *Eur J Cardiothorac Surg* 2016;49:1624–31.

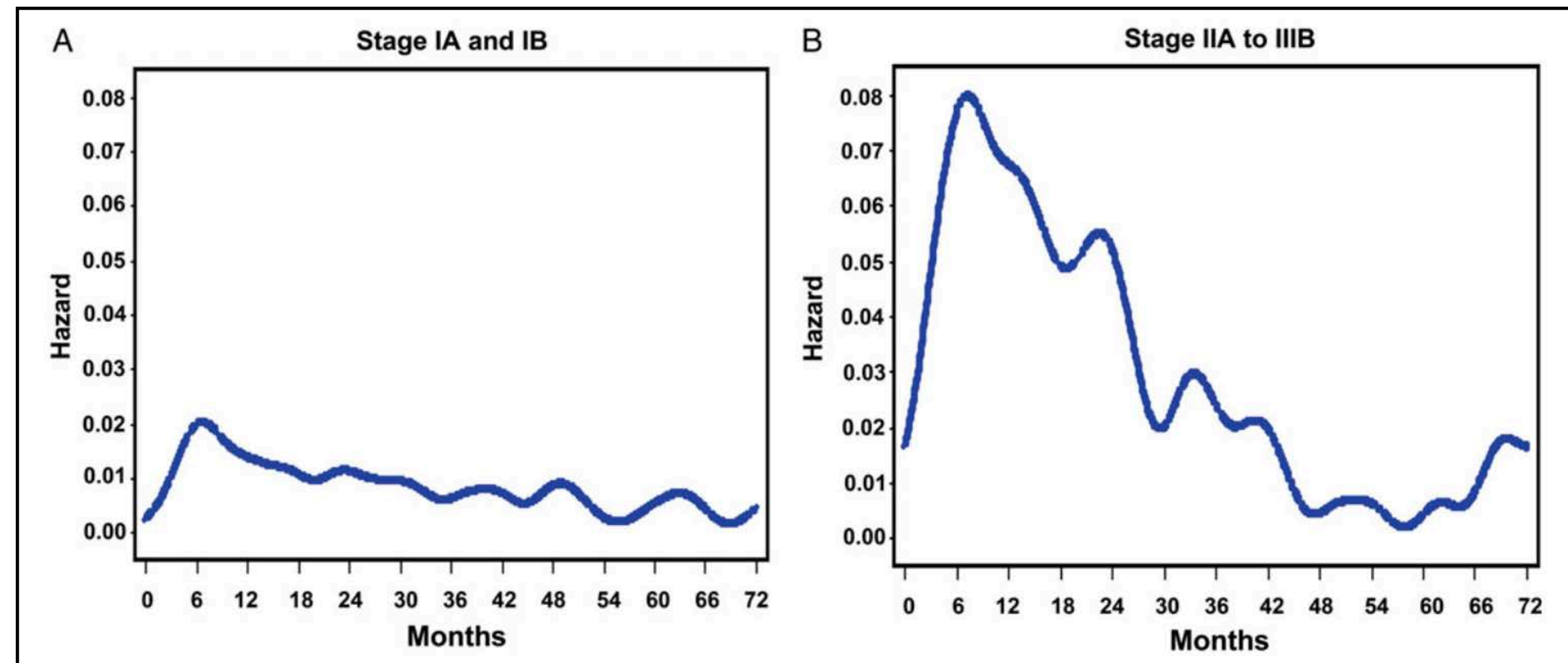
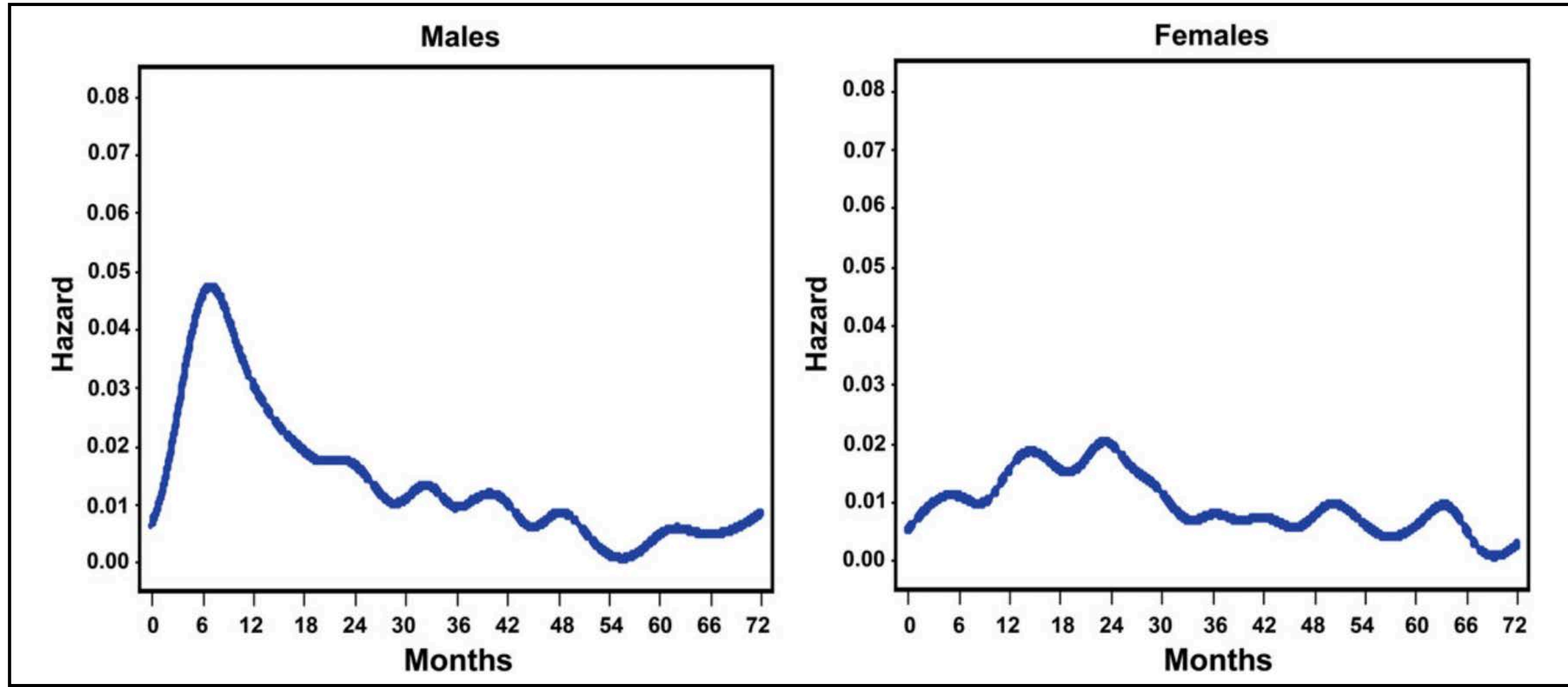
Postoperative follow-up strategy based on recurrence dynamics for non-small-cell lung cancer[†]

Katsuya Watanabe^{a,*}, Masahiro Tsuboi^b, Kentaro Sakamaki^c, Teppei Nishii^a, Taketsugu Yamamoto^a, Takuya Nagashima^a, Kohei Ando^a, Yoshihiro Ishikawa^a, Tekkan Woo^a, Hiroyuki Adachi^a, Yutaka Kumakiri^a, Takamitsu Maehara^a, Haruhiko Nakayama^a and Munetaka Masuda^a

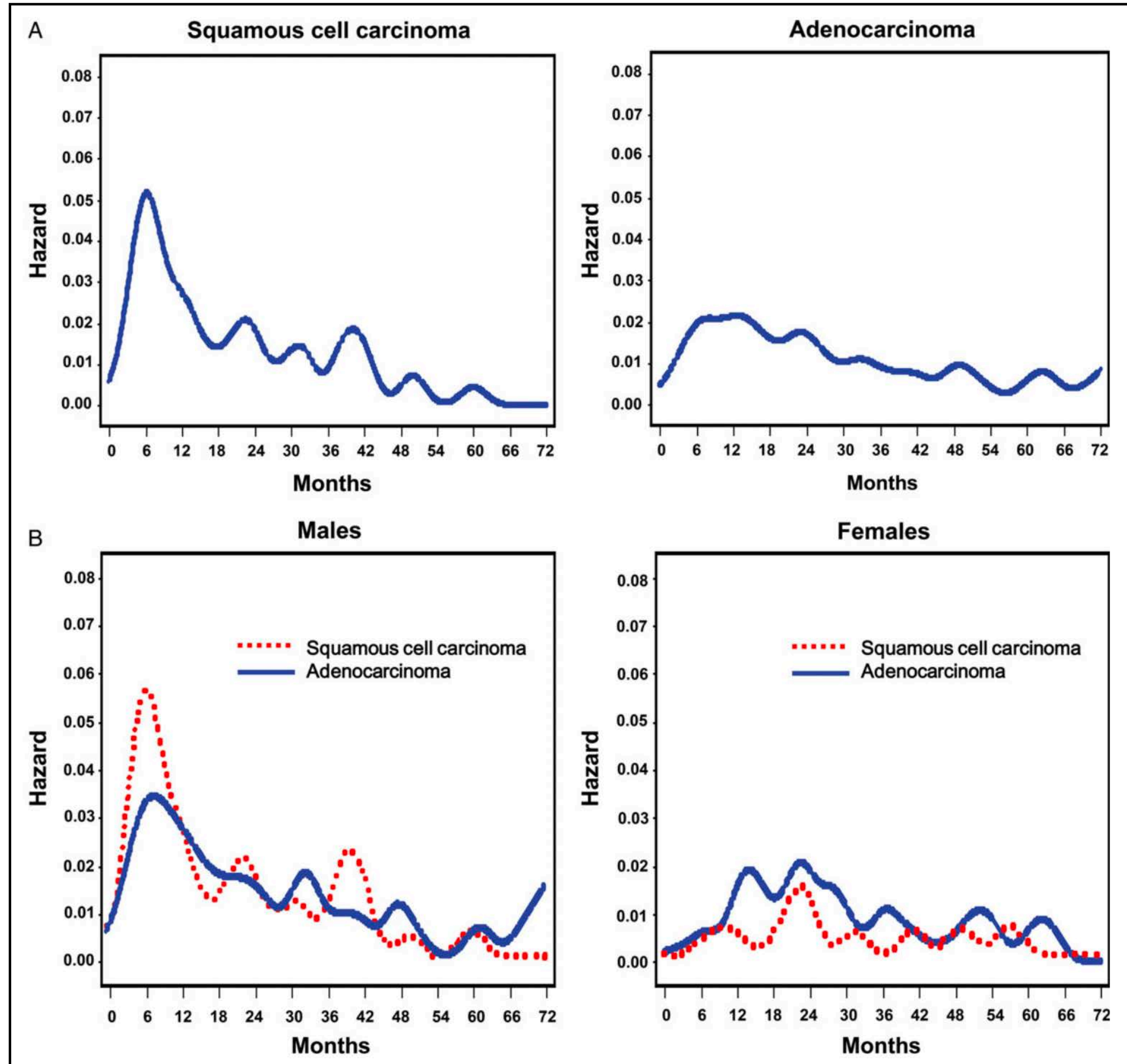
To clarify postoperative follow up strategy based on time of recurrence



Follow up strategy



Follow up strategy



Bimodal recurrence pattern

Hospital visitation programmes-

focus on 6–8 and 22–24 months after surgery

Male- 6-8 months

Female- 22 to 24 months

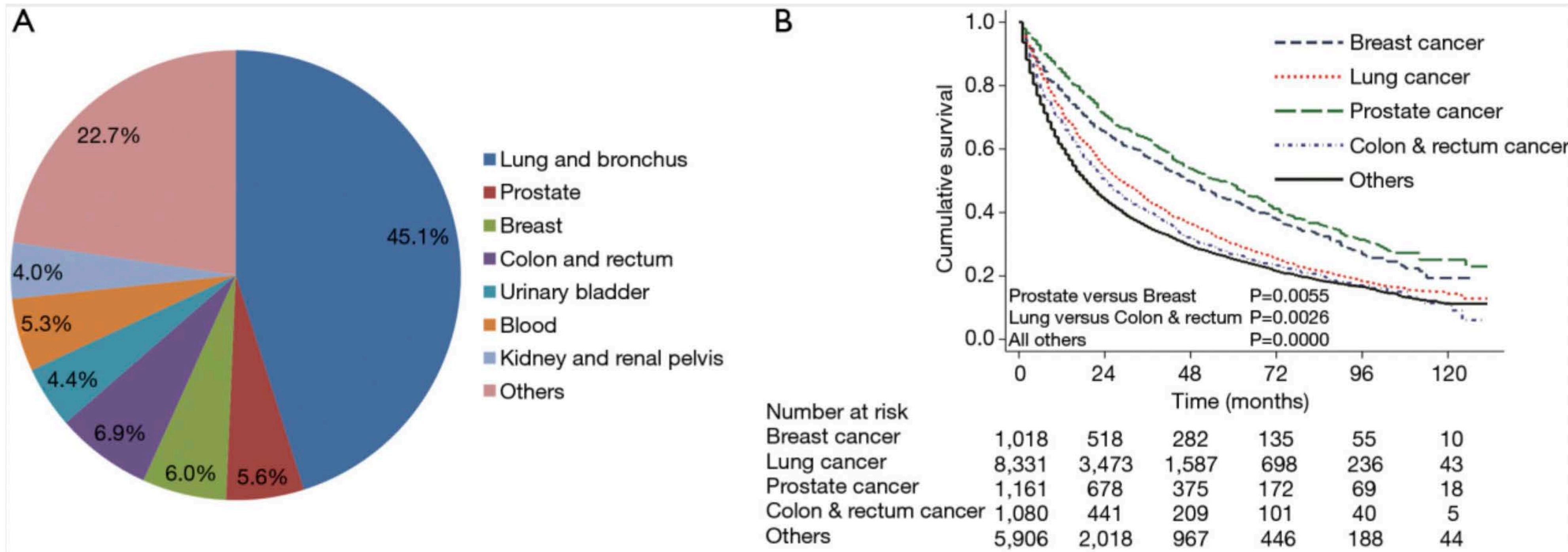
Newer evidences on recurrence

Recurrence location	Arm A: Lobectomy (N=554)	Arm B: Segmentectomy (N=552)	P value*
Total	44 (7.9%)	67 (12.1%)	0.0214
Loco-regional	17 (3.1%)	38 (6.9%)	
Distant	14 (2.5%)	7 (1.3%)	
Loco-regional + distant	13 (2.3%)	20 (3.6%)	
Unclassified	0	2	
Proportion of local recurrence	30 (5.4%)	58 (10.5%)	0.0018

	Lobar N=351	Sublobar N=336	Total N=687	P-Value [†]
Overall	103 (29.3%)	102 (30.4%)	205 (29.8%)	0.8364
Locoregional only	35 (10%)	45 (13.4%)	80 (11.6%)	0.2011
Regional only	9 (2.6%)	6 (1.8%)	15 (2.2%)	0.6623
Any Distant	59 (16.8%)	51 (15.2%)	110 (16.0%)	0.6323

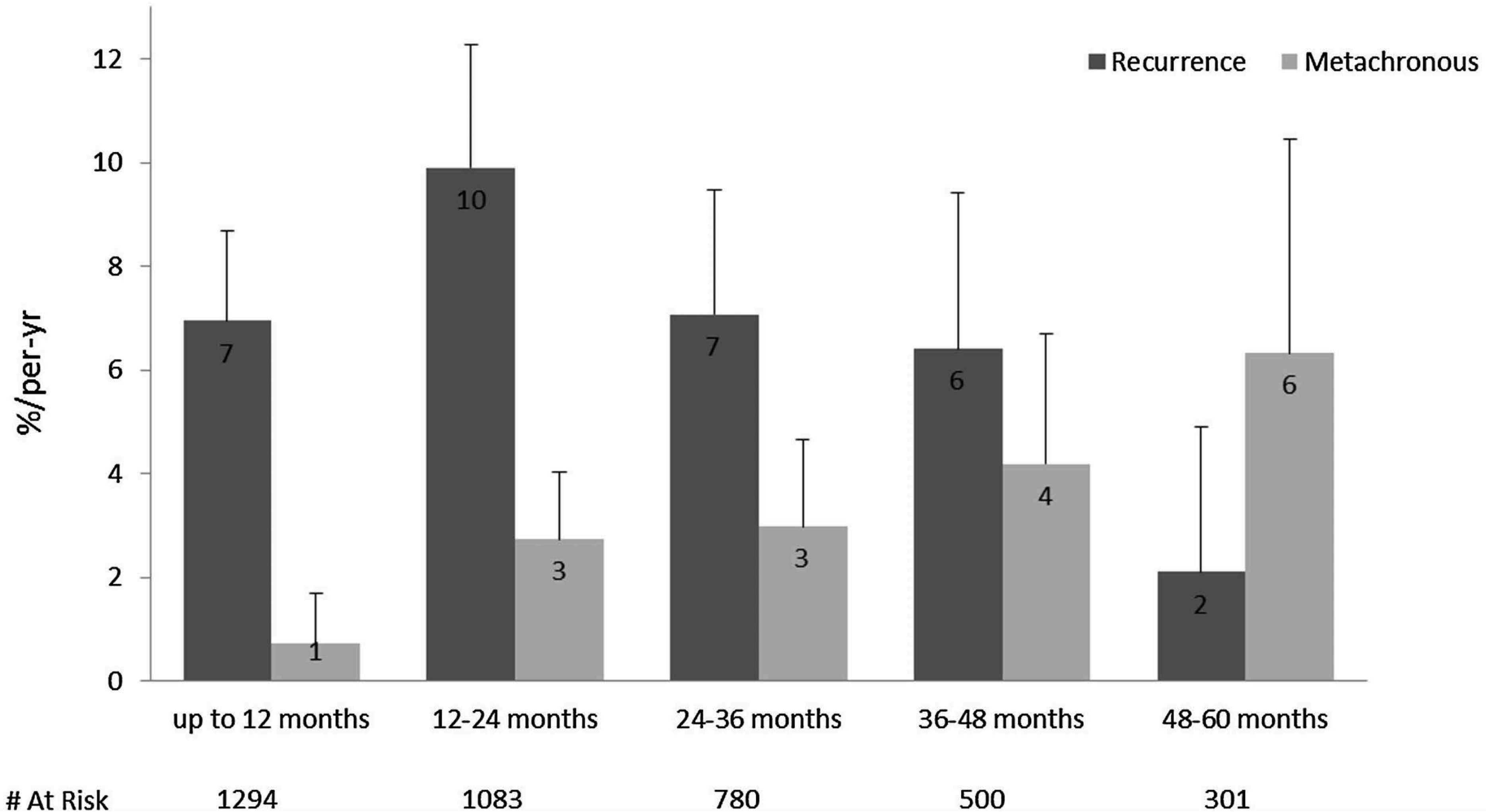
Second primary

SEER database review- 2004 to 2014



Recurrence and Second Primary

Rates of Recurrence and Metachronous Cancer After Surgery



Recommendations

Organization	Summary of recommendations	Classification of recommendations
ACCP [18]	Surveillance by clinical examination and chest radiography or CT should be performed every 6 months for 2 years and then yearly for patients with good performance status and pulmonary function	Grade 1C
ESMO [19]	A follow-up visit every 3–6 months is recommended during 2–3 years, less often—e.g. annually—thereafter	III, B
	For follow-up, history and physical examination, chest CT and, to a lesser extent, chest X-ray are appropriate tools	III, B
NCCN [20]	History and physical examination with contrast-enhanced CT scan every 4–6 months for 2 years	2B
	Then history and physical examination and non-contrast-enhanced CT scan annually	2B
ASCO [21]	For patients treated with curative intent, in the absence of symptoms, a history and physical examination should be performed every 3 months during the first 2 years; every 6 months thereafter through year 5; and yearly thereafter	None
	For patients treated with curative intent, there is no clear role for routine studies in asymptomatic patients and patients in whom no interventions are planned	
NICE [22]	Offer all patients an initial specialist follow-up appointment within 6 weeks of completing treatment to discuss ongoing care. Offer regular appointments thereafter, rather than relying on patients requesting appointments when they experience symptoms	None
	Offer protocol-driven follow-up led by a lung cancer clinical nurse specialist as an option for patients with a life expectancy of more than 3 months	
	Ensure that patients know how to contact the lung cancer clinical nurse specialist involved in their care between their scheduled hospital visits	

IFCT 0302

- Phase 3
- Randomised
- Open label
- 122 French Hospitals
- Approved by Ethical committee, Data Monitoring +
- Study period: Jan 3, 2005 – Nov 30, 2012

Randomisation

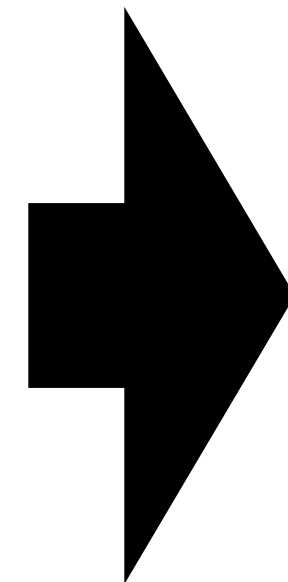
- Two groups
 - Minimal follow up group (CXR)
 - CT based follow up group (CECT chest+ CXR+ FOB)

- Randomised- 8 weeks after surgery

- Stratified Randomisation
 - Centre
 - Stage
 - Periop- chemo/radio
 - Computer generated randomisation

Outcome

- Primary end point- OS
- Secondary end point-
 - DFS
 - Survival from recurrence or second primary
 - Genetic risk factor for lung cancer,
 - Health related QoL
 - Cost effectiveness

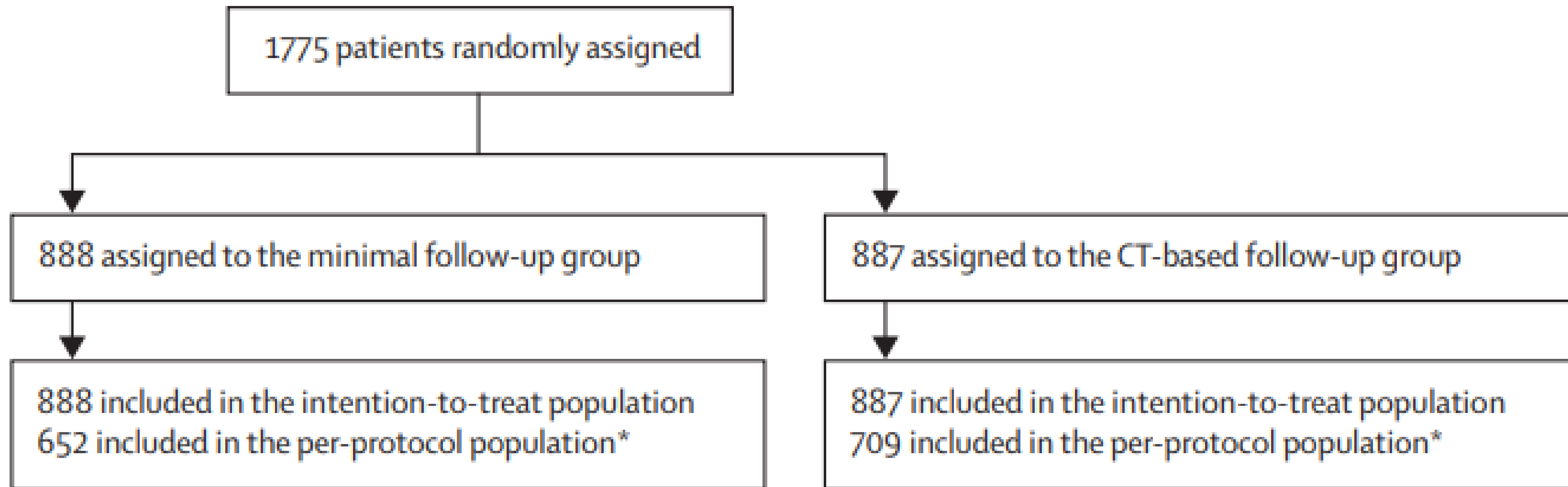


Awaited

Statistical analysis

- Difference of 7.5% in 3 year OS
- Estimated 3 yr OS of 40% in the minimal follow up group (changed to 68%)
- Power- 90% and alpha level of 5%
- Intention to treat analysis

Result

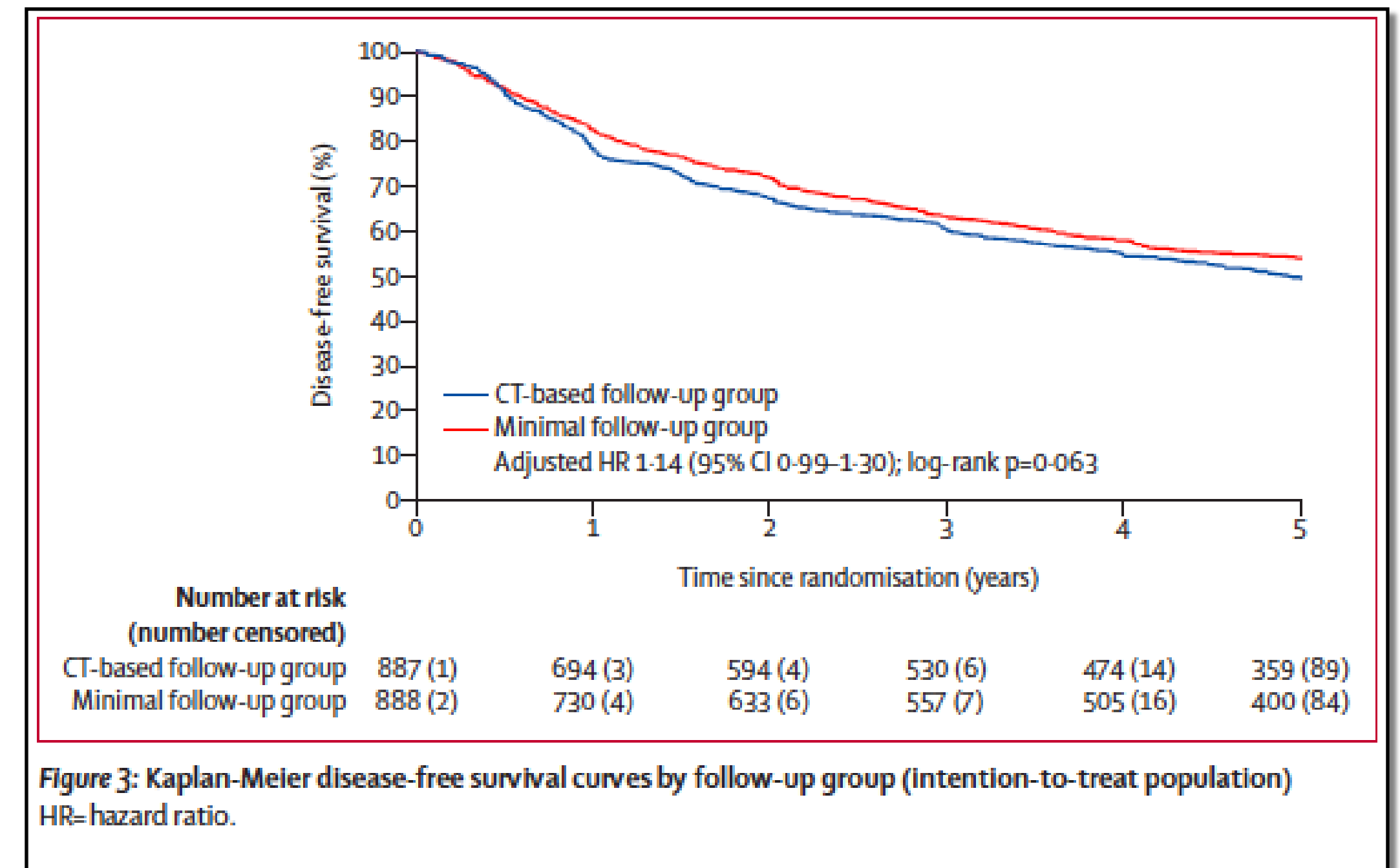
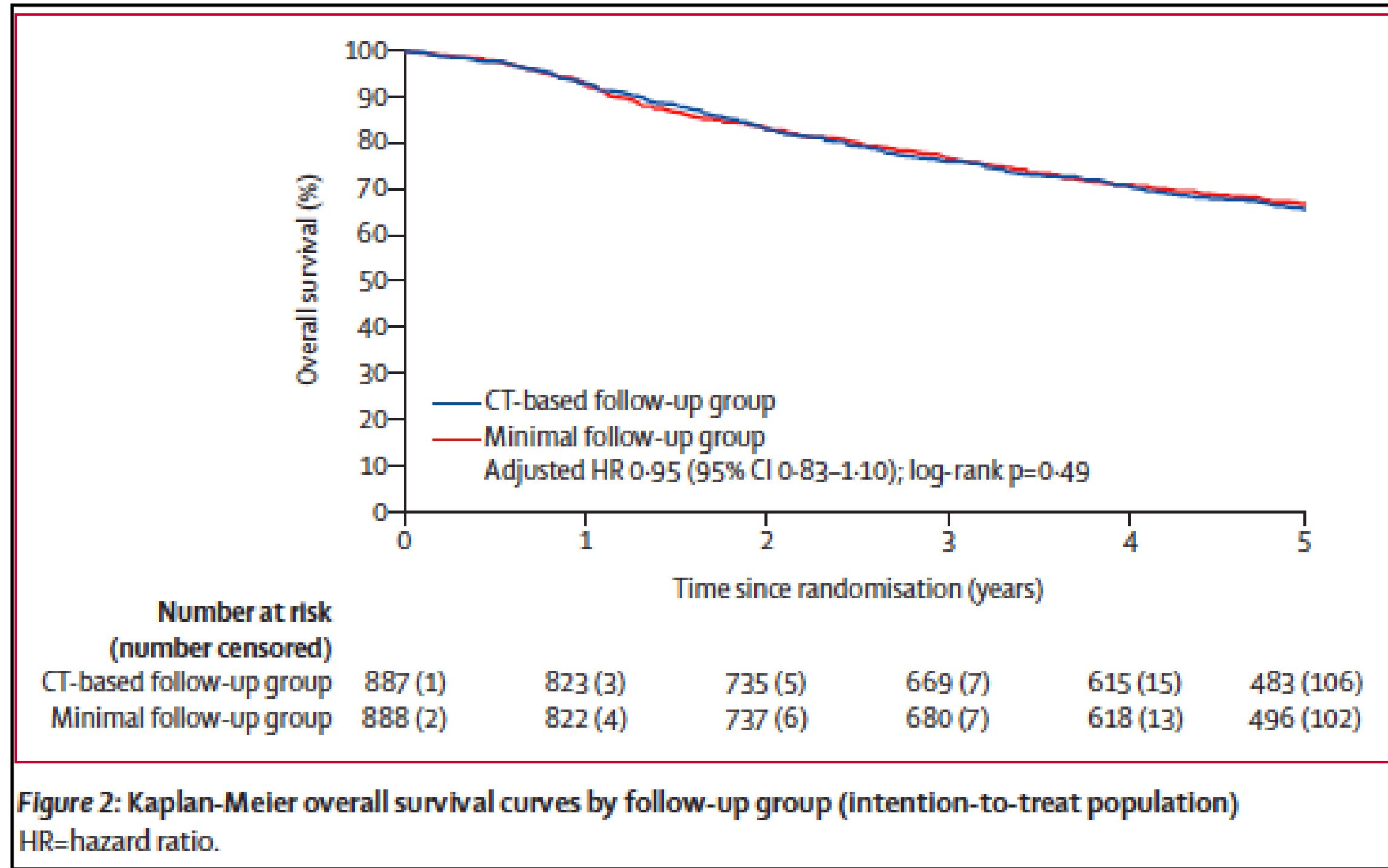


Result

	Minimal follow-up group (n=888)	CT-based follow-up group (n=887)
Sex		
Male	678 (76.4%)	677 (76.3%)
Female	210 (23.6%)	210 (23.7%)
Median age, years (IQR)	63.0 (57.1-70.4)	62.9 (56.2-70.5)
Histological subtype		
Squamous	307 (34.6%)	307 (34.6%)
Adenocarcinoma	520 (58.5%)	522 (58.9%)
Large cell	38 (4.3%)	41 (4.6%)
Others	23 (2.6%)	17 (1.9%)
Smoking status		
Former or current smoker	818 (92.1%)	805 (90.7%)
Never smoker	68 (7.7%)	80 (9.0%)
Unknown	2 (0.2%)	2 (0.3%)
Clinical stage		
I	606 (68.2%)	599 (67.5%)
II	119 (13.4%)	125 (14.1%)
III	161 (18.1%)	161 (18.1%)
Unknown	2 (0.2%)	2 (0.3%)

Clinical stage		
I	606 (68.2%)	599 (67.5%)
II	119 (13.4%)	125 (14.1%)
III	161 (18.1%)	161 (18.1%)
Unknown	2 (0.2%)	2 (0.3%)
Surgery		
Lobectomy or bilobectomy	758 (85.4%)	775 (87.4%)
Pneumonectomy	111 (12.5%)	95 (10.7%)
Segmentectomy	16 (1.8%)	15 (1.7%)
Unknown	3 (0.3%)	2 (0.2%)
Pathological stage		
I	559 (62.9%)	561 (63.2%)
II	158 (17.8%)	165 (18.6%)
III	163 (18.4%)	152 (17.1%)
Unknown	8 (0.9%)	9 (1.0%)
Preoperative chemotherapy, or preoperative radiotherapy, or both	110 (12.4%)	116 (13.1%)
Postoperative chemotherapy, radiotherapy, or both	342 (38.5%)	350 (39.5%)
Preoperative or postoperative radiotherapy, or both	80 (9.0%)	74 (8.3%)
Preoperative or postoperative chemotherapy, or both	397 (44.7%)	403 (45.4%)

ITT- OS, DFS



Result

- Most frequent site of metastases
 - Ipsilateral lung
 - Contralateral lung
 - Brain

CXR

Recurrences- 27.7%
Symptomatic- 82.5%

CT scan

Recurrences- 32.6%
Symptomatic- 56%

- 250 unjustified CT scans done in the minimal follow up group

Interesting findings

CXR

Surgery-5.7%

Radical therapy for second primary- 19%

CT scan

Surgery-10.3%

Radical therapy for second primary- 29%

- Amongst all the recurrences detected in the CT scan group; 42% were not detected on a concomitant CXR
- Only 3.3% were detected on FOB- which could not be picked up on a CT scan

Discussion

- CT scan group
 - higher proportion of asymptomatic recurrences
 - higher proportion of second primaries
 - earlier stage

Not powered enough to show OS benefit in recurrences and second primaries

STRENGTHS

- Randomised design
- 90% compliance
- Median follow up of 7.2 years
- Robust data on recurrences and second primaries

WEAKNESS

- Higher proportion of stage I and II cancers
- Started in 2005- **almost 17 years ago**- treatment strategies have changed significantly
- No central radiology review- not mentioned who interpreted the x ray or CT findings
- Criteria for following up pulmonary nodules also have changed over time- not sure what criteria were used at different time points in the study
- Significant cross over b/w groups- around 8 %

CONCLUSIONS

- CT scan-
 - More sensitive
 - Significant advancement in treatment- better tolerated in asymptomatic patients (better performance status)
- Problems
 - Cost effective?
 - False positive
 - More robust evidence needed

Thank You