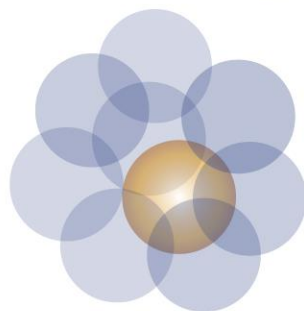


Outcome and quality of surgical treatment in invasive NSCLC patients in Luxembourg

Catherine Goetzinger, Michel Untereiner, Julien Jacobs, Michael Schnell, David Marcic, Valéry Bocquet, Sophie Couffignal



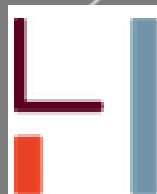
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National Cancer Registry of Luxembourg – Data Sources



Additional Data sources:

- Deaths certificates (Health Ministry)
- National Health Insurance (CNS)
- 'Contrôle Médicale de la Sécurité Sociale' (CMSS)
- Doctors



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State of the arts – Recommended treatment for invasive NSCLC

Early and locally advanced NSCLC

Surgery:

- Stage I&II
- Stage III if willing to accept procedure related risks
- Lobectomy – tumours > 2cm (Stage II)

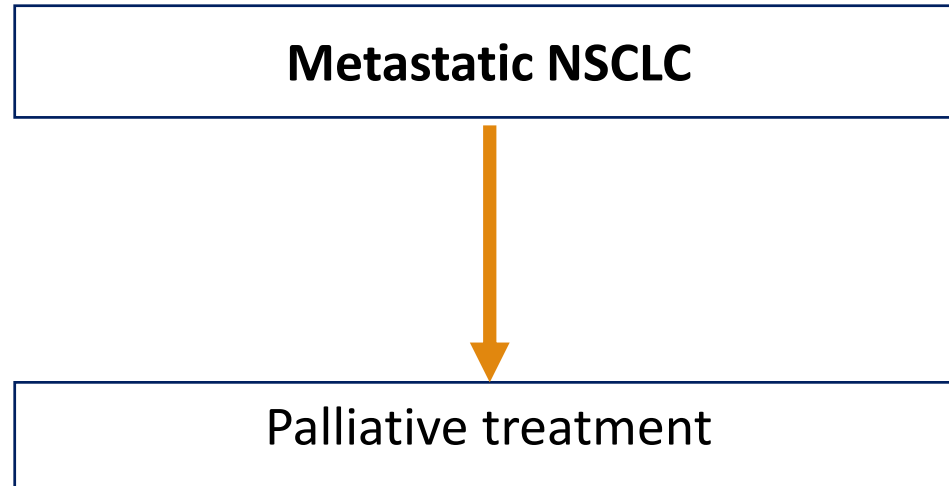
Chemotherapy:

- Stage II & III
- Recommended 6 weeks after surgery

Radiotherapy:

- Stereotactic body radiotherapy (SABR)
 - Non-surgical choice for stage I,
 - Patients with COPD,
 - Stage III - Inoperable tumours (> 5cm) & elderly

State of the arts – Recommended treatment for invasive NSCLC



Source; ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up

Objective & Research Questions & Statistical analysis

To investigate the treatment provided to invasive non small cell lung cancer (NSCLC) patients in Luxembourg with a special emphasis on the surgical treatment and its outcome

Research question1:

Does the association between age, gender, morphology and stage differ on receiving surgical treatment?

→ **Logistic regression**

Dependent variable:

→ Surgical treatment

Independent variables:

→ Age, Gender, Morphology, Stage, Multidisciplinary team meeting (MDT meeting)

Research question2:

Do patient and clinical characteristics differ within those operated and the type of surgery, lymph node assessment and chemotherapy?

→ **Chi-square test (X^2)**

Dependent variable:

→ Lymph node assessment, Type of surgery
Chemotherapy, Chronology

Independent variables:

→ Age, Gender, Morphology, Stage, MDT meeting, Co-morbidities (Charlson's Index)

Methodology

Population-based cancer registry of Luxembourg

- Inclusion criteria:
- Age: >15y
 - Morphology: NSCLC
 - Tumour behaviour: Invasive
 - Index cases only

348 eligible subjects

Main analysis

- Exclusion of subjects that:
- Died before initial treatment
 - Refused initial treatment
 - Did not receive their 1st initial treatment modality within 6 months after diagnosis

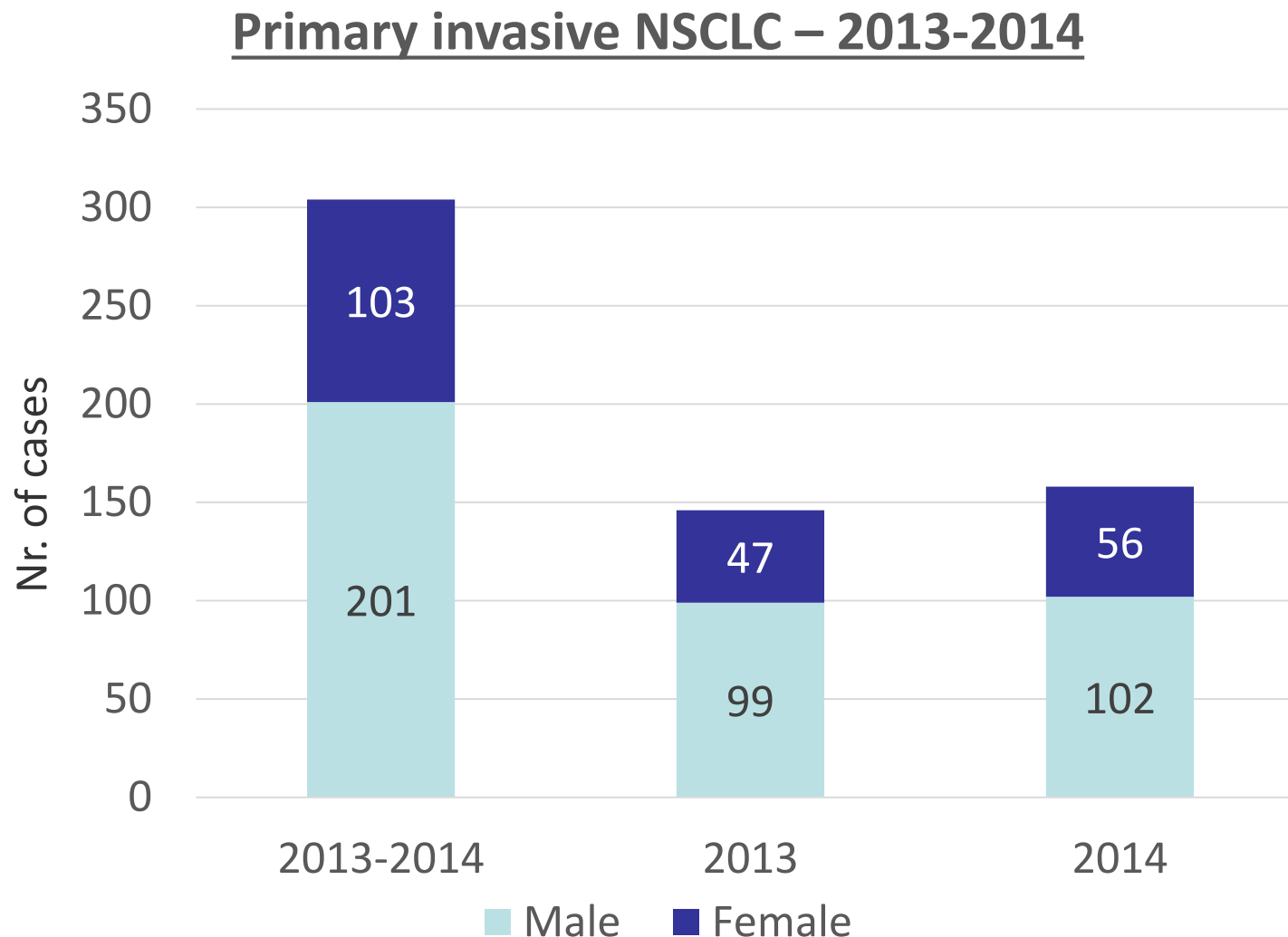
Total sample → N= **304 subjects**

Additional analysis

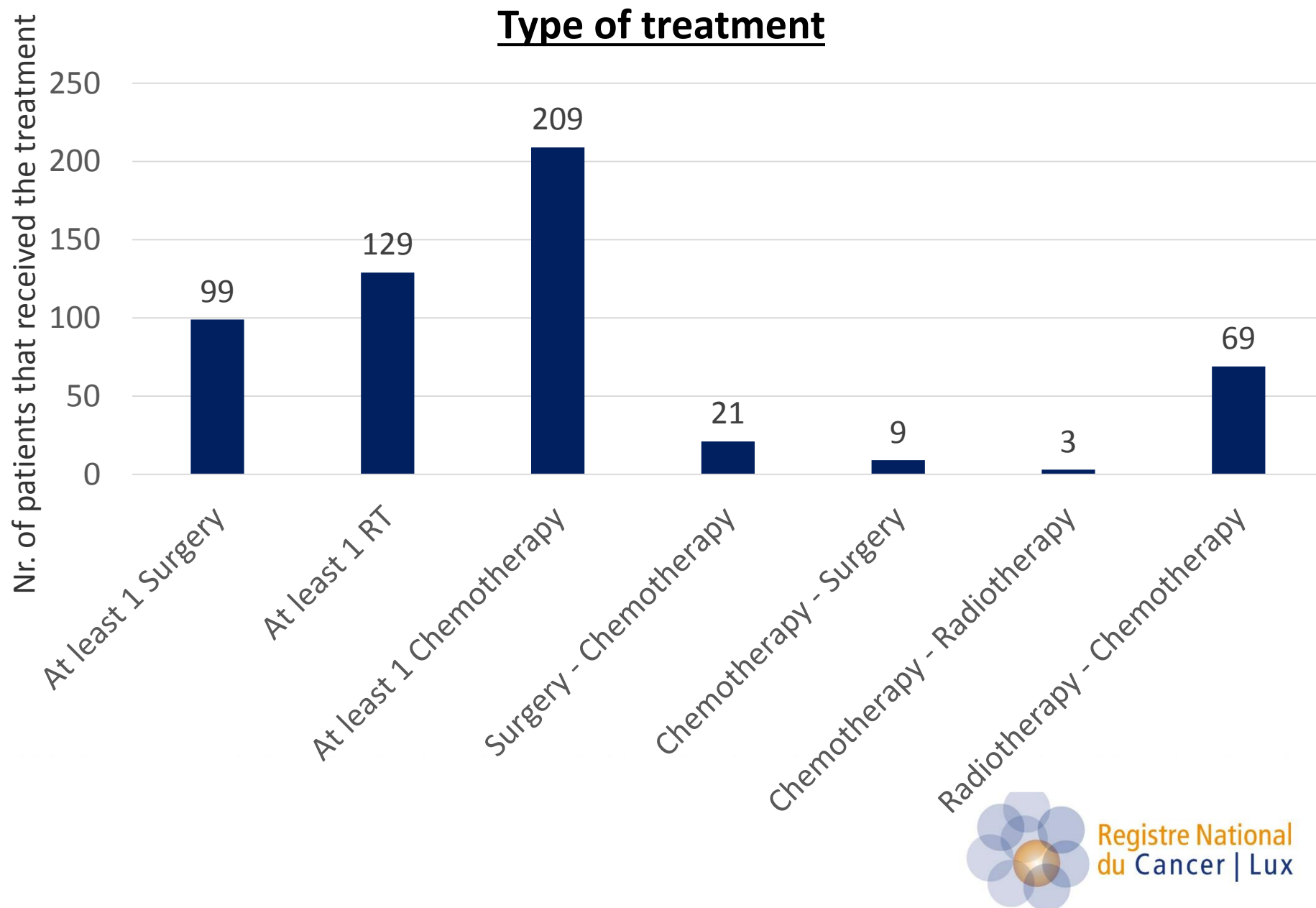
Exclusion of non-operated subjects

Total sample → N= **99 subjects**

Results – General characteristics



Results – General characteristics



General characteristics – Operated vs Non-operated

	Operated (%) N = 99	Non-operated (%) N = 205	P
Gender			0.37
<i>Male</i>	62 (63)	139 (68)	
<i>Female</i>	37 (37)	66 (32)	
Age			0.04
<i>15-59</i>	33 (33)	40 (20)	
<i>60-69</i>	27 (27)	66 (32)	
<i>70-79</i>	30 (31)	66 (32)	
<i>≥80</i>	9 (9)	33 (16)	
Morphology			0.02
<i>Adenocarcinoma</i>	58 (59)	91 (44)	
<i>Squamous cell adenocarcinoma</i>	28 (28)	59 (29)	
<i>Other carcinomas</i>	13 (13)	55 (27)	

General characteristics – Operated vs Non-operated

	Operated (%) N = 99	Non-operated (%) N = 205	P
Stage			<0.001
<i>Local stage (I&II)</i>	66 (67)	18 (9)	
<i>Advanced local stage (III)</i>	22 (22)	49 (24)	
<i>Metastatic stage</i>	10 (10)	127 (62)	
<i>Unspecified stage</i>	1 (1)	11 (5)	
MDT meeting			<0.001
<i>Yes (at least one)</i>	92 (93)	147 (72)	
<i>No</i>	7 (7)	58 (28)	

Logistic regression - Factors associated with having at least 1 surgery

		Crude model		
		OR	95% CI	P
Age				0.04
	15-59	1		
	60-69	0.50	0.26-0.94	0.32
	70-79	0.55	0.29-1.04	0.06
	≥ 80	0.03	1.14-0.79	0.01
Morphology				0.02
	Adenocarcinoma	2.70	1.36-5.37	0.01
	Squamous cell carcinoma	2.01	0.95-4.27	0.07
	Other carcinoma	1		
Stage				<0.001
	Local stage (I & II)	40.33	4.89-333.5	0.001
	Advanced local stage (III)	4.94	0.60-40.66	0.14
	Metastatic stage	0.87	0.10-7.41	0.90
	Unspecified stage	1		
MDT meeting				
	Yes (at least one)	5.19	2.27-11.85	<0.001
	No	1		

Logistic regression - Factors associated with having at least 1 surgery

		Adjusted model		
		OR	95% CI	P
Age				0.05
	15-59	1		
	60-69	0.35	0.14-0.89	0.03
	70-79	0.46	0.19-1.12	0.09
	≥ 80	0.21	0.06-0.70	0.01
Morphology				0.04
	Adenocarcinoma	2.80	1.08-7.07	0.03
	Squamous cell carcinoma	1.20	0.46-3.17	0.71
	Other carcinoma	1		
Stage				<0.001
	Local stage (I & II)	31.70	3.41-294.7	0.002
	Advanced local stage (III)	4.18	0.46-38.4	0.21
	Metastatic stage	0.51	0.05-4.80	0.55
	Unspecified stage	1		
MDT meeting				
	Yes (at least one)	2.39	0.89-6.42	0.08
	No	1		

Additional analysis - General characteristics in those operated

	Proportion of operated NSCLC patients (N(%)) N=99
Type of surgery	
<i>Pneumectomy</i>	5 (5)
<i>Lobectomy</i>	72 (73)
<i>Bi-lobectomy</i>	7 (7)
<i>Anatomic segmentation</i>	5 (5)
<i>Non-anatomic resection</i>	6 (6)
<i>Unknown</i>	4 (4)
Adequate lymph node assessment	
<i>Yes</i>	60 (61)
<i>No</i>	39 (39)

	Proportion of operated NSCLC patients (N(%)) N=99
Chemotherapy	
<i>Yes</i>	31 (31)
<i>No</i>	66 (67)
<i>Refused</i>	2(2)
Chronology	
<i>Surgery-Chemo</i>	21 (21)
<i>Chemo-Surgery</i>	9 (9)
<i>Only 1 surgery</i>	69 (70)

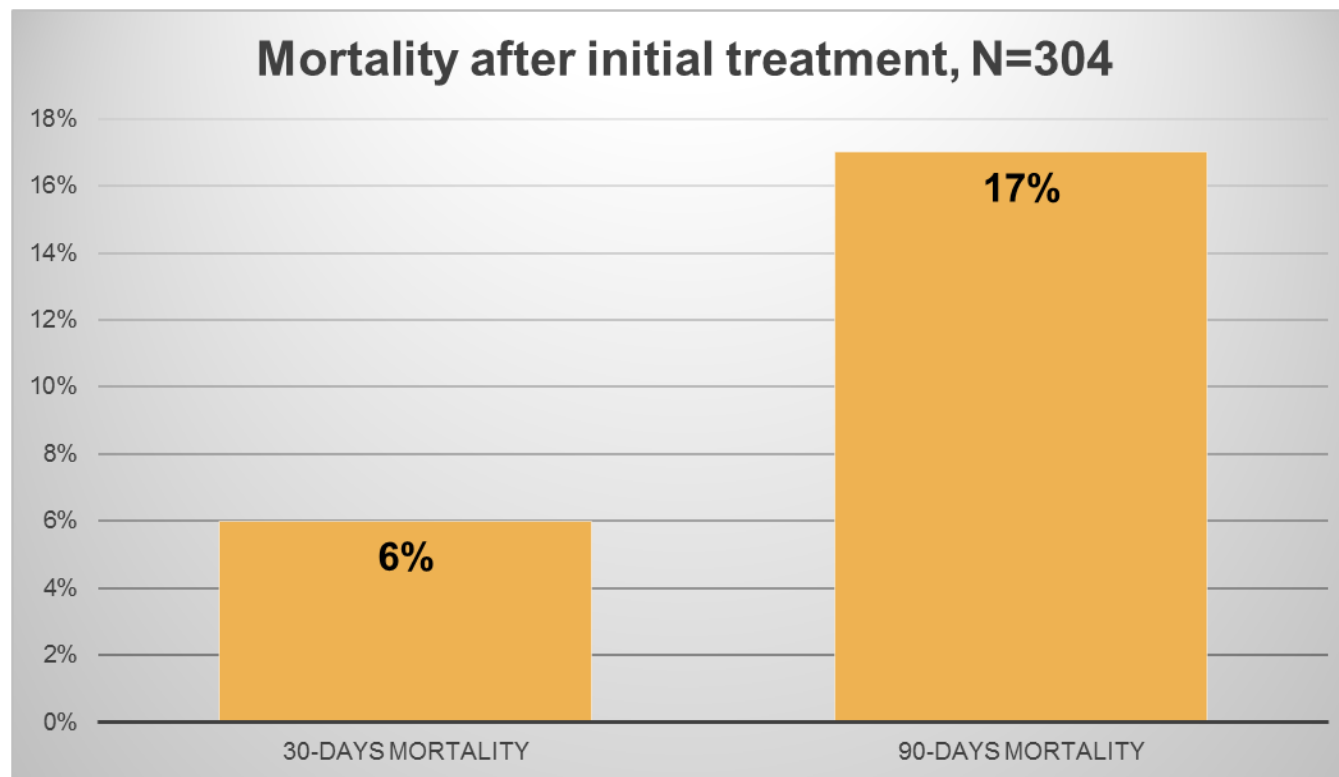
Determinants differing in operated NSCLC patients

		<i>Lymph node assessment</i>		<i>P</i>		<i>Type of surgery</i>					<i>P</i>		<i>Chemotherapy</i>		<i>P</i>		<i>Chronology</i>		<i>P</i>	
		Yes	No			T1	T2	T3	T4	T5			Yes	No			Surg-Chemo	Chemo-Surg		
Gender				0.81							0.77				0.93				0.09	
	<i>Men</i>	37 (62)	25 (64)			3 (60)	47 (65)	3 (43)	3 (60)	3 (50)			20 (65)	42 (64)			16 (76)	4 (44)		
	<i>Female</i>	23 (38)	14 (36)			2 (40)	25 (35)	4 (57)	2 (40)	3 (50)			11 (35)	24 (36)			5 (24)	5 (56)		
Age				0.83							0.28				0.47				0.47	
	<i>15-59</i>	22 (37)	11 (28)			2 (40)	19 (26)	5 (72)	3 (60)	3 (50)			13 (42)	18 (27)			9 (43)	4 (45)		
	<i>60-69</i>	15 (25)	12 (31)			2 (40)	24 (33)	1 (14)	-	-			8 (26)	19 (29)			6 (28)	2 (22)		
	<i>70-79</i>	18 (30)	12 (31)			1 (20)	22 (31)	1 (14)	1 (20)	3 (50)			7 (22)	23 (35)			5 (24)	1 (11)		
	<i>≥ 80</i>	5 (8)	4 (10)			-	7 (10)	-	1 (20)	-			3 (10)	6 (9)			1 (5)	2 (22)		
Co-morbidity (Charlson's Index)				0.001							0.92				0.80				0.62	
	<i>Score 0</i>	13 (22)	16 (53)			1 (33)	20 (30)	2 (33)	2 (50)	2 (40)			9 (38)	19 (31)			6 (35)	3 (50)		
	<i>Score 1-2</i>	41 (71)	9 (30)			2 (67)	39 (59)	3 (50)	1 (25)	3 (60)			13 (54)	36 (58)			9 (53)	3 (50)		
	<i>Score 3+</i>	4 (7)	5 (17)			-	7 (11)	1 (17)	1 (25)	-			2 (8)	7 (11)			2 (12)	-	0.02	
Morphology				0.49							0.06				0.03					
	<i>Adenocarcinoma</i>	38 (63)	20 (51)			1 (20)	45 (62)	2 (29)	3 (60)	4 (67)			14 (45)	43 (65)			10 (48)	3 (33)		
	<i>Squamous Cell Carcinoma</i>	15 (25)	13 (33)			4 (80)	18 (25)	3 (42)	-	2 (33)			14 (45)	13 (20)			11 (52)	3 (33)		
	<i>Others</i>	7 (12)	6 (16)			-	9 (13)	2 (29)	2 (40)	-			3 (10)	10 (15)			-	3 (33)		
Stage				0.47							0.08				0.00				0.09	
	<i>Local stage (I&II)</i>	40 (67)	26 (67)			2 (40)	54 (75)	3 (42)	2 (40)	2 (33)			8 (26)	56 (85)			5 (24)	3 (33)		
	<i>Advanced local stage (III)</i>	15 (25)	7 (18)			3 (60)	13 (18)	2 (29)	1 (20)	2 (33)			16 (52)	6 (9)			13 (62)	2 (22)		
	<i>Metastatic stage</i>	5 (8)	5 (13)			-	4 (6)	2 (29)	2 (40)	2 (33)			6 (19)	4 (6)			2 (10)	4 (45)		
	<i>Unspecified stage</i>	-	1 (2)			-	1 (1)	-	-	-			1 (3)	-			1 (4)	-		
MDT meeting				0.01							0.41				0.84				0.34	
	<i>Yes</i>	59 (98)	33 (85)			4 (80)	68 (94)	7 (100)	4 (80)	5 (83)			29 (94)	61 (92)			19 (91)	9 (100)		
	<i>No</i>	1 (2)	6 (15)			1 (20)	4 (6)	-	1 (20)	1 (17)			2 (6)	5 (8)			2 (9)	-		

T1; Pneumonectomy, T2; Lobectomy, T3; Bi-lobectomy, T4; Anatomic Segmentectomy, T5; Non-anatomic resection

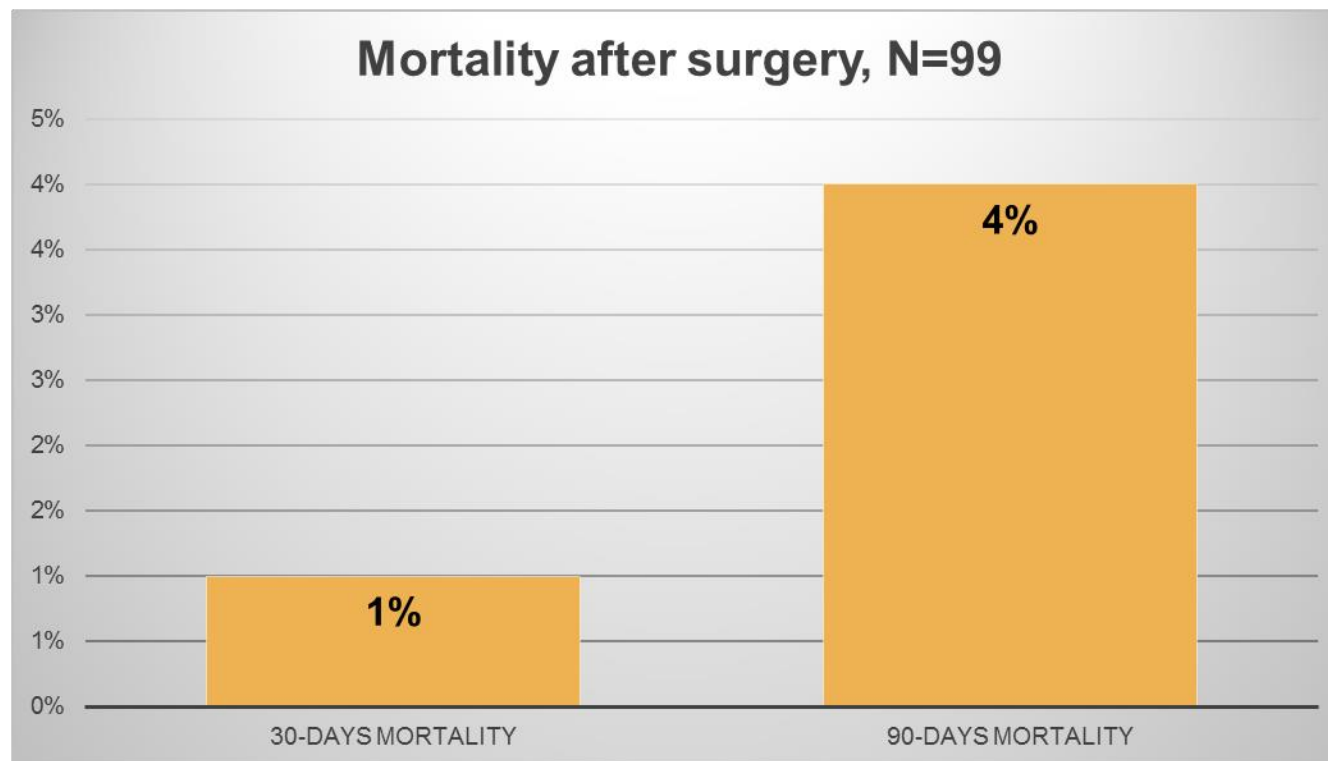
Comorbidity = 11 missing

30-day & 90-day Mortality Rate after Initial Treatment



	Yes	No
30-day Mortality	19	285
90-day mortality	51	253

30-day & 90-day Mortality Rate After Surgery



	Yes	No
30-day Mortality	1	98
90-day mortality	4	95

Discussion/Conclusion

- NSCLC patients tend to receive a surgery:
 - At younger age
 - At the presence of an adenocarcinoma
- Operated NSCLC patients tend to receive:
 - A lobectomy
 - A lymph node assessment
 - No additional chemotherapy
 - If chemotherapy was given surgery came first
- Low mortality rates were observed for invasive NSCLC patients both 30 and 90 days after receiving surgical treatment between 2013-2014 in Luxembourg

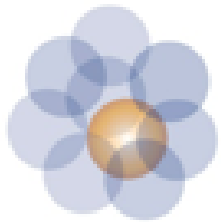
Luxembourgish clinicians tend to follow the international guidelines regarding the performance of surgical treatment in invasive NSCLC patients

The role of surgery is key in successfully treating NSCLC patients

Thank you for your attention!



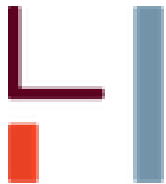
Acknowledgements



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Registrars of each hospital
hospitals

Members of the scientific
committee of the national
cancer registry

Registry Team:

- Dr Sophie Couffignal,
- Dr Michel Untereiner,
- Julien Jacobs,
- Michael Schnell,
- David Marcic,
- Dr Valéry Bocquet,
- Stéphanie Saleh,
- Dominique Brault,
- Laurent Nullens,
- Catherine Goetzinger

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