

DATABASE ANNUAL REPORT

2022

PRODUCED BY THE ESTS DATABASE COMMITTEE



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**EUROPEAN SOCIETY
OF THORACIC SURGEONS
DATABASE COMMITTEE**

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INDEX

Message from the President of ESTS	6
Message from Director of ESTS Database	8
The European Society of Thoracic Surgeons Database	10
List of Contributing Centres	13
PART 1 - European Database Cumulative Activity (2007-2020) –Only European units	18
Overall age and gender distributions	20
Total surgical activity within the entire dataset	22
Lung resections	27
Primary lung cancer	38
Comparisons of outcomes between 2007-2013 vs 2014-2021 in the total dataset	44
Hospital mortality trending presented as CUSUM plots	46
PART 2 - Units-specific Activity & Comparative Analysis between Contributing Units (2007 – 2020) - Only European units	49
Number of units enrolled in the ESTS database as of December 2019, by country	50
Epidemiologic data	51
Primary lung cancer per contributing units	58
Observed versus predicted in-hospital mortality rates of major lung resections in different European units	66
PART 3 – Thymoma Section	68
Thymoma Section fields	71
PART 4 – Mesothelioma Section	97
Mesothelioma Section fields	99
PART 5 – NETTS Section	112
NETTS Section fields	115

PART 6 – CHEST WALL Section 132

Chest Wall Section fields 134

PART 7 – AIRWAYS Section New Project 156

Appendices

Appendix 1: Database format and submission of data	159
Appendix 2: Definition of major cardiopulmonary complications	167
Appendix 3: ESTS institutional accreditation program	169
Appendix 4: Setting a National Registry “Hungarian Model”	173
Appendix 5: Report from SBCT	184
Appendix 6: General Data Protection Regulation (GDPR)	209

Message from the President of ESTS - Alessandro Brunelli

I am very emotional to write this Presidential preface to the 2022 Silver book.

Today I went to my library in my office and browsing the shelves I found the first edition of the ESTS DB report which was published in 2009. At the time I wrote the Preface in my role of Director of ESTS Audit and Database.



This is an extract of my words at the time: *“This is the first annual report of the ESTS online Thoracic Database. At the time of data analysis approximately 60 units had requested the login account and 22 had contributed more than 20 patients. The aim of this report is to provide an overview of the thoracic surgery activity in Europe....We hope that this first report will provide useful data to all contributors and will represent a reliable basis on which to build an effective European Quality Improvement Program”.*

Writing a message today, 13 years later as the President of the Society after seeing the evolution and exponential growth of our database is both honour and pleasure.

Most of the words that I had written to introduce that very first report applies still today.

The main purpose of our database is to assess the thoracic surgical practice in our Continent and to provide benchmark figures to individual units. It serves as an instrument for risk adjustment that can be used to properly measure quality of care.

Maybe not everybody knows the story about the origin of the nickname of our Annual Report, fondly known today as “Silver Book”. At the time, when we agreed to publish a booklet summarising the data in the ESTS database, we discussed at length how to name it. We had to choose a memorable name, which could distinguish it and identify it globally.

Many colours were taken already by other Organisations or similar initiatives (i.e. there was already a blue book, a red book etc.). Then we decided to go fancy and glittering and chose the colour silver (as gold seemed too ambitious and perhaps arrogant at that time).

The Database Committee included 5 members at the time of the first Report in 2009 (Drs. A. Brunelli, R. Berrisford, G. Rocco, D. Van Raemdonck and G. Varela), it has expanded now to 13

members to represent different sub-groups within the Committee (i.e. Chest Wall, Thymic, NET, Mesothelioma).

The first report focussed only on lung resections. Precisely it reported on only 2057 lung resections. The 2022 Report includes 213,000 procedures, of which 165,000 are lung resections. In the last year, despite all the difficulties caused by the pandemic, 125 centres registered at least 100 patients in the database.

I am personally grateful to all the members, past and present, of the Database Committee for their continuous effort in progressing what I believe is the most valuable asset of our Organisation. I am especially grateful to Mr. Richard Berrisford who preceded me as Director of Database and is to be considered the creator of our registry since the early 2000s'. He was instrumental to raise the awareness of the importance of data collection among our community. I enjoyed my years as Director of Database from 2008 to 2012. Those were important years when we achieved historical deals with the French Society to import the Epithor data and with the STS, to harmonise the definitions of variables in the Database.

Dr. Falcoz did a fantastic job during his long tenure as Director of the Database to further expand our reach and reputation. I am very happy now that Dr. Szanto is leading the committee with his dedication, passion and knowledge in this field and I am confident he will bring our Database to an even higher level of excellence.

Our database remains the most important source for quality initiatives and thanks to the data collected in the database we are able to generate risk adjusting models and to define and measure several process measures with the ultimate aim to improve and harmonise the thoracic surgical practice across Europe.

Finally, I wish to thank all the contributors to the database. Data collection is a hard work, often underestimated or diminished but essential to improving patients' care. Contributing to the ESTS database means contributing to the betterment of our specialty respecting our mission value to improve quality of care in all its aspects.

Alessandro Brunelli
President of ESTS

Message from the Director of ESTS Database

Dear Colleagues and Friends,

I am very pleased to present you the 12th edition of the ESTS Silver book summarizing the thoracic surgical activity from 2007 to 2021. The current edition, as in previous years, traditionally notes the observations and experience in the field of thoracic surgery serving the Society's quality, research, and patient safety activities.



In 2021 125 European Units contributed at least 100 cases in the ESTS Database summing up to 15814 new patient records. Due to the increasing interest of the dedicated units and surgeons to record and contribute their cases, the Database has grown to contain more than 210,000 procedures since its inception in 2007. This striking result is based on the firm structure designed by our previous Database Director Pierre-Emmanuel Falcoz supported by the professional cooperation of KDataClinical srl. Knowing that the last two years have put us under a never-seen pressure due to the Covid pandemic it is even more remarkable. The ESTS Database now represents one of the most significant structured information in fields of thoracic surgery divided to well-designed Sub-databases; the Thymic section led by Bernhard Moser, the Mesothelioma by Andrea Billé, the NETs Registry by Pier Luigi Filosso, the Airway by Konrad Hötzenecker and Benoit Bibas, and the Chest Wall Registry by Jose Ribas M. Campos. The importance of the focused work in the different Sub-Databases are highlighted by the cooperation in the IASLC/ITMIG TNM classification as well as in the multidisciplinary treatment program of lung NETs and the cooperation with ETOP and CRAB. Collaborations with the French Thoracic Surgical Society through Epithor as well as with the Hungarian Society are further continued, and a new contributing partnership has been established with the Italian VATS Group mediated by Roberto Crisci and Luca Bertolaccini. A novel and exciting joint collaboration has started this year with the the Society of Thoracic Surgeons General Thoracic Surgery Database to explore and realize common tasks. The same enthusiasm is also valid for the freshly started ESTS Digital Transformation Group aiming to to create international networking between all colleagues worldwide to evaluate and assist all the changes that have impacted our healthcare activities.

In the followings you will have the explicit summary of the registered ESTS data from 2007- to 2021, plus the detailed workup of the data in the different sub-databases. Generally the continuing trend of lung procedures getting away from the open technique and being performed using minimally invasive techniques is evident (40,3% among all lung resections and 37,3% in primary lung cancer), just like the increase in the lobar (61,1%) and sub-lobar (8%) anatomical lung resections. On the other hand the proportion of the non-anatomical wedge (20%) resections and the proportion of pneumonectomies (6%) are steadily decreasing especially in primary lung cancer surgeries. Overall data completeness is constantly improving especially in the viewpoints of the minimum dataset, but there is always a need for further improvement. You will find a detailed description in the following pages.

The institutional accreditation program received high interest in 2021. Due to recording and submitting excellent quality data 15 units have received the ESTS Institutional accreditation and 2 further centers have been re-accredited. They join the growing group of ESTS accredited centers using the benefits and potential of the quality marks, the shared platform enabling to improve quality and patient safety. To enhance the participation of the contributing units we have been attentive to suggestions from data managers, contributing surgeons and have focused current revision efforts on improving the functionality and practicality of the ESTS Database. Improved user-friendly setup plus provision of actionable information to participants is aimed to improve the contribution, whilst our GDPR compliant data storage offers assurance for sufficient data safety.

On behalf of the ESTS Database Committee I would like to thank all the recent and future data contributors for their admirable efforts and valuable cooperation. After two years of non-personal meetings we are glad to meet you for real at The Hague to receive your feedback and hope to discuss new initiatives in person! Don't forget to download the short version of the Silver Book from the Congress App!

Dr. Zalan Szanto

Director of ESTS Audit and Database

The European Society of Thoracic Surgeons Database

The European Society of Thoracic Surgeons Database was founded in 2001 by the ESTS Database Committee with the aim to develop risk-adjusted instruments for assessing the performance of thoracic surgery units across Europe. The first version of the Database led to the publication of the first risk-adjusted multinational risk-score for mortality (*Berrisford R et al. Eur J Cardiothorac Surg 2005; 28:305-311*) which has been already applied to compare the performance of different units (*Brunelli A et al. Eur J Cardiothorac Surg 2008; 33:284-288*).

The second version of the Database was launched online in July 2007 and has so far accrued approximately 205 general thoracic surgical units.

Data is anonymously reported, independently accessed and encrypted to other users.

Participation to the Database project is **totally free and voluntary**, but strongly recommended by our Society. In fact participation to the ESTS Database with at least 100 Major Lung Resections per year for at least 2 consecutive years is one of the key requirements for the ESTS Accreditation Program. You can access the Database from ESTS website or by using the address: <https://ests.kdataclinical.it>

To join the Database you need your own personal login account that you can request by downloading and completing an application form from the ESTS homepage (<http://www.ests.org>).

Once data is being recorded on the System (*powered by KData Clinical software*), you will be able to visualize your up-to-date summary of your surgical activity; called Clinical Care Analysis CCA, it includes a few surgical activity indicators (*Total N Procedures, Types Lung Procedures, VATS, Outcome at discharge, CPS and eligibility for ESTS Accreditation*)

To the benefit of your patients, your practice and your specialty, your data will contribute to the followings:

- Development of European benchmarks of performance through the analysis of outcomes and processes of care indicators.
- Performance assessment by risk-adjusted outcome and/or process indicators, which will allow you to compare your own institutional performance against European benchmarks.
- Analysis and development of new potential outcomes and processes of care indicators that may complement/substitute current quality of care measures.
- Autocalculation of the Composite Performance Score.
- Feedback to document quality efforts and areas for improvement in quality of care.
- Data for research projects, which can be used to assess new technologies/pathways of care that can ultimately lead to improved patient care and outcomes.
- Maintain your own data if data is requested or mandated by third parties.
- Use for local hospital administration resource allocation.
- Use for individual negotiations, public relations and expert witness.
- Opportunity to participate in a European quality improvement effort for general thoracic surgery that has a positive impact at the local, national and international levels.

Participants benefits

- Participation to the ESTS Database is a pre-requisite to participate in the European Institutional Quality Certification Program.
- Participation will be acknowledged and, if requested, local institutional administrations made aware that your unit is enrolled in a European Thoracic Database aimed at implementing quality of care monitoring and improvement programs endorsed by ESTS and pre-requisite for future clinical Institutional European Accreditation.
- Your own data, collected in a standardized ESTS-endorsed Dataset, can be downloaded at local level and used for your internal quality analyses or institutional research purposes.
- Participants can visualize in the CCA (currently it includes: *Total N Procedures, Types Lung Procedures, VATS, Outcome at discharge, CPS and eligibility for ESTS Accreditation*) and be first to know about the quality of their data and their performance against European benchmarks.
- Participants can propose their own research projects based on the total data present in the database. Projects should be submitted to the ESTS database Committee for peer review and, if accepted, the requested and anonymized data will be provided to the proponent of the project. ESTS will retain the responsibility for the final analysis and interpretation of results. The proponent of the project will be the first Author of the final manuscript and he/she will be allowed to include, if requested, two additional colleagues, who helped in the

elaboration of the manuscript. The members of the Database Committee who contributed to the review process and assisted in the development of the manuscript will be also included in the list of Authors.

As the ESTS Database approached a more mature stage, and more demanding aspects of data management were required, it was been decided to make use of professional expertise in running and managing contents, data flow, data merge and so on of our Registry; in Nov 2009 the ESTS Council awarded this task to Dendrite Clinical System Italia srl, now renamed KData Clinical srl, following a management by-out in July 2015

Since 1993 Dendrite, and now KData Clinical, have established a highly respected track record in setting up and running a variety of International Registries, with an underlying philosophy of long term partnership with numerous Clinical Associations within and outside Europe.

The main reasons for their widespread activity in this field include:

- Bottom-up approach to data management: the range of products and services starts from database and electronic patient records and serves Clinicians daily needs; it escalates to hospital-wide systems, to regional, national and finally to international registries.
- User-friendly inclusion of all who wish to participate: the Import Data process, governed by a Standard Operating Procedure SOP (see Appendix N.4) allows any Contributor to use his chosen type of tool to collect data, and KData will perform the correspondence and data merge required to add their data to the main ESTS Database, if there is clinically correct conformity with the required ESTS dataset.
- Automatically up-dated clinical statistical analysis shown in the CCA screen, integrated in the data collection section of the ESTS Registry.
- Contributors can retain, download and use own data, from the ESTS site, in MS Excel format, which lends itself to be analyzed by any clinical software product.
- Unblemished track record of data handling integrity: not ever lost, leaked or misplaced third Party data to date

Institutions that contributed to the ESTS Registry

Please note that Only units contributing more than 100 patients and consistently (as of December 31th 2021) in the registry are shown

Country	City	Institution
ALBANIA	TIRANA	University Hospital of Lung Diseases "Shefqet Ndroqi"
AUSTRIA	VIENNA	Otto Wagner Hospital
BELGIUM	ANTWERP	University Hospital of Antwerp
BELGIUM	GENK	ZOL St. - Jan Genk
BELGIUM	BRUSSELS	Cliniques Universitaires Saint- Luc
BELGIUM	BRUSSELS	Hopital Academique Erasme
BELGIUM	BRUSSELS	CHU Saint-Pierre UMC Sint-Pieter
BELGIUM	LEUVEN	University Hospitals Leuven
BELGIUM	GILLY	GHDC Site Gilly, Belgium
CROATIA	ZAGREB	Department of Thoracic Surgery "Jordanovac" University Hospital Centre Zagreb
FRANCE	LA ROCHELLE	Hôpital St Louis
FRANCE	LE HAVRE	Clinique Petit Col Moulin
FRANCE	LE PLESSISROBINSON	Marie Lannelongue Hospital
FRANCE	LILLE	CHU Calmette
FRANCE	LILLE	Clinique de la Louvière
FRANCE	LILLE	Polyclinique du Bois
FRANCE	LYON	CHU Lyon Sud
FRANCE	LYON	Clinique St Louis
FRANCE	LYON	Hôpital privé Jean Mermoz
FRANCE	MARSEILLE	CHU Ste Marguerite
FRANCE	MARSEILLE	HIA Alphonse LAVERAN
FRANCE	MAXEVILLE	Médipole Gentilly
FRANCE	MEAUX	CH - Meaux
FRANCE	METZ	Hôpital Belle-Isle
FRANCE	MONTPELLIER	CHU de Montpellier
FRANCE	MONTPELLIER	Clinique du Millénaire
FRANCE	MORLAIX	CMC de la Baie de Morlaix
FRANCE	NANCY	CHU Central de
FRANCE	NANTES	CHU - Nantes
FRANCE	NANTES	Clinique St Augustin
FRANCE	NANTES	Nouvelle Clinique Nantaise

FRANCE	NICE	CHU Pasteur
FRANCE	NICE	Clinique Saint Georges
FRANCE	NIMES	Clinique les Franciscaines
FRANCE	PARIS	HEGP
FRANCE	PARIS	Hôtel Dieu
FRANCE	PARIS	IMM
FRANCE	PAU	CHG - Pau
FRANCE	POITIERS	CHU - Pointers
FRANCE	QUIMPER	Clinique Quimper sud
FRANCE	REIMS	Clinique Courlancy
FRANCE	ROUEN	CHU Charles Nicolle
FRANCE	SAINT BRIEUC	Hopital Yves le Foll
FRANCE	SAINT CLOUD	Clinique du Val D'or
FRANCE	SAINT ETIENNE	CH Privé de la Loire
FRANCE	SAINT ETIENNE	CHU – Saint Etienne
FRANCE	SAINT GRÉGOIRE	CH Privé Saint Grégoire
FRANCE	STRASBOURG	CHU - Strasbourg
FRANCE	STRASBOURG	Clinique St Odile
FRANCE	TALANT	Clinique Bénigne Joly
FRANCE	TOULOUSE	CHU Larrey
FRANCE	TOULOUSE	Clinique Pasteur
FRANCE	TOURS	CHU Trousseau
FRANCE	VALENCIENNES	Clinique Teissier
FRANCE	VANNES	Clinique Océane
GERMANY	BREMEN	Klinikum Bremen-Ost - Bremen
GERMANY	MONCHENGLADBACH	Maria Hilf Kliniken
GERMANY	DELMENHORST	Klinik f. Thoraxchirurgie, Klinikum Delmenhorst gGmbH
GERMANY	ESSEN	Medical University of Essen, Ruhrlandklinik, Dept. of Thoracic Surgery
GREECE	ATHENS	Evangelismos
GREECE	THESSALONIKI	Ahepa University Hospital
HUNGARY	BUDAPEST	National Institute of Oncology
HUNGARY	BUDAPEST	KORANYI National Institute for Pulmonology and Semmelweis University
HUNGARY	BUDAPEST	Bajcsy-Zsilinszky Körház Thoracic surgery
HUNGARY	DEBRECEN	University Of Debrecen
HUNGARY	SZEGED	University of Szeged, Department of Surgery
HUNGARY	PÉCS	University of Pecs, Department of Surgery
HUNGARY	GYŐR	Pamok Győr Hungars
HUNGARY	KECSKEMÉT	Bàcs Kiskun County Hospital

HUNGARY	GYÓR	Petz Aladar Teaching Hospital (PAMOK)
HUNGARY	MISKOLC	Semmelweis Teaching Hospital of Miskolc
HUNGARY	SZOLNOK	Hetenyi Geza County Hospital of Szolnok
HUNGARY	SZOMBATHELY	Teaching Hospital Markusovszky
IRELAND	DUBLIN	St. James's Hospital, Dublin, Republic of Ireland
ITALY	ALESSANDRIA	A.O. Alessandria (Ospedale Civile)
ITALY	BARI	Policlinico Univ. Bari
ITALY	BARI	Opedale San Paolo Bbari
ITALY	BERGAMO	Humanitas Gavazzeni
ITALY	BOLZANO	A.O. Bolzano
ITALY	NAPLES	National Cancer Institute Pascale Foundation, Napoli
ITALY	NAPLES	OSP. Dei Colli - Monaldi
ITALY	NAPLES	AORN Cardarelli
ITALY	NAPLES	A.O.U. L. Vanvitelli
ITALY	ANCONA	Ospedali Riuniti Umberto I - GM Lancisi – G Salesi Ancona
ITALY	MILANO	Fondazione Ospedale Maggiore Policlinico
ITALY	MILANO	A.O. San Paolo
ITALY	MILANO	Ospedale San Raffaele
ITALY	MILANO	Istituto Europeo Oncologico
ITALY	MILANO	IRCCS Fondazione Ca' Granda
ITALY	MILANO	A.O. Niguarda
ITALY	MILANO	IRCCS Istituto Nazionale dei Tumori
ITALY	PARMA	University Hospital Parma
ITALY	TORINO	OSP. San Giovanni Bosco
ITALY	TORINO	A. O. Universitaria Molinette San Giovanni Battista
ITALY	FOGGIA	A. O. Universitaria Foggia – Dip. Chirurgia Toracica
ITALY	MILANO	Azienda Ospedaliero San Paolo
ITALY	ROZZANO(MI)	IRCCS Istituto Clinico Humanitas
ITALY	BOLOGNA	Discipline Chirurgiche, Rianimatorie Trapianti Univ.Bologna
ITALY	GENOVA	IRCCS San Martino - Genoa
ITALY	DENOVA	Osp. Villa Scassi
ITALY	SIENA	A.O. Univ. Senese
ITALY	LECCE	A.O. LECCE – V. Fazzi Hospital
ITALY	UDINE	AOU S. Maria della Misericordia
ITALY	ROMA	Campus Bio-Medico University Hospital, Thor. Surgery
ITALY	ROMA	University of Rome La Sapienza, Dep. Thoracic Surgery
ITALY	ROMA	Fondazione Policlinico Gemelli, University Cattolica del sacro cuore, IRCCS
ITALY	ROMA	Policlinico Umberto I

ITALY	ROMA	A.O. Sant'Andrea
ITALY	ROMA	Forlanini
ITALY	MONZA	Chirurgia Toracica San Gerardo
ITALY	BRESCIA	Spedali Civili
ITALY	CAGLIARI	P.O.A. Businco
ITALY	CATANZARO	Az.Osp. di Catanzaro "Pugliese Ciaccio"
ITALY	CHIETI	Chir. Gen. e Tor. UNIV. Chieti
ITALY	CUNEO	Chir. Tor. S. Croce E Carle
ITALY	FERRARA	Chir Gen e Tor. A.O. Ferrara
ITALY	FIRENZE	A.O.U. Carreggi
ITALY	FORLI'	Univ. degli studi Bologna -U.O.Chir.Tor.AUSL Romagna
ITALY	MANTOVA	ASST Mantova e ASST Cremona
ITALY	MESSINA	Univ. di Messina
ITALY	MESTRE	A.O. Mestre - Venezia – Ospedale Civile
ITALY	MISTERBIANCO	Humanitas Centro Catanese di Oncologia
ITALY	MODENA	Policlin. Univ. Modena
ITALY	NEGRAR	OSP. Sacro Cuore Negrar
ITALY	NOVARA	A.O. Novara - UPO
ITALY	PADOVA	A.O. Padova - Unipd
ITALY	PALERMO	ISMETT
ITALY	PALERMO	OO.RR. Villa Sofia - Cervello
ITALY	PERUGIA	A.O. Univ. Perugia
ITALY	PISA	A.O. Univ. Pisana
ITALY	S.GIOVANNI ROTONDO	Polm. IRCCS Casa Sollievo della Sofferenza
ITALY	TARANTO	U.O.S.D. Chir.Tor. – Osp. Ss. Annunziata
ITALY	TERAMO	A.O. Teramo
ITALY	VARESE	Osp. di Circolo - Uninsubria
ITALY	VERONA	A.O. Verona – Borgo Trento
NETHERLANDS	AMSTERDAM	VUMC Dept of Surgery
NETHERLANDS	BREDA	Amphia Hospital
NETHERLANDS	HAARLEM	Kennemer Gasthuis
POLAND	POZNAN	Marcinkowski University of Medical Sciences
POLAND	WARSAW	National Institut of Tuberculosis and Lung Disease Warsaw
POLAND	POZNAN	Wielkopolskie Centrum Pulmonologii i Torakochirurgii im. Eugenii i Janusza Zeylandów Szamarzewskiego
PORTUGAL	LISBON	Santa Martha Hospital, Lisbon
PORTUGAL	VILA NOVA DE GAIA	centro Hospitalar de Vila Nova de Gaia Espinho
ROMANIA	BUCHAREST	Institute of Oncology Bucharerst
ROMANIA	BUCHAREST	Marius Nasta Institute of Pneumonology

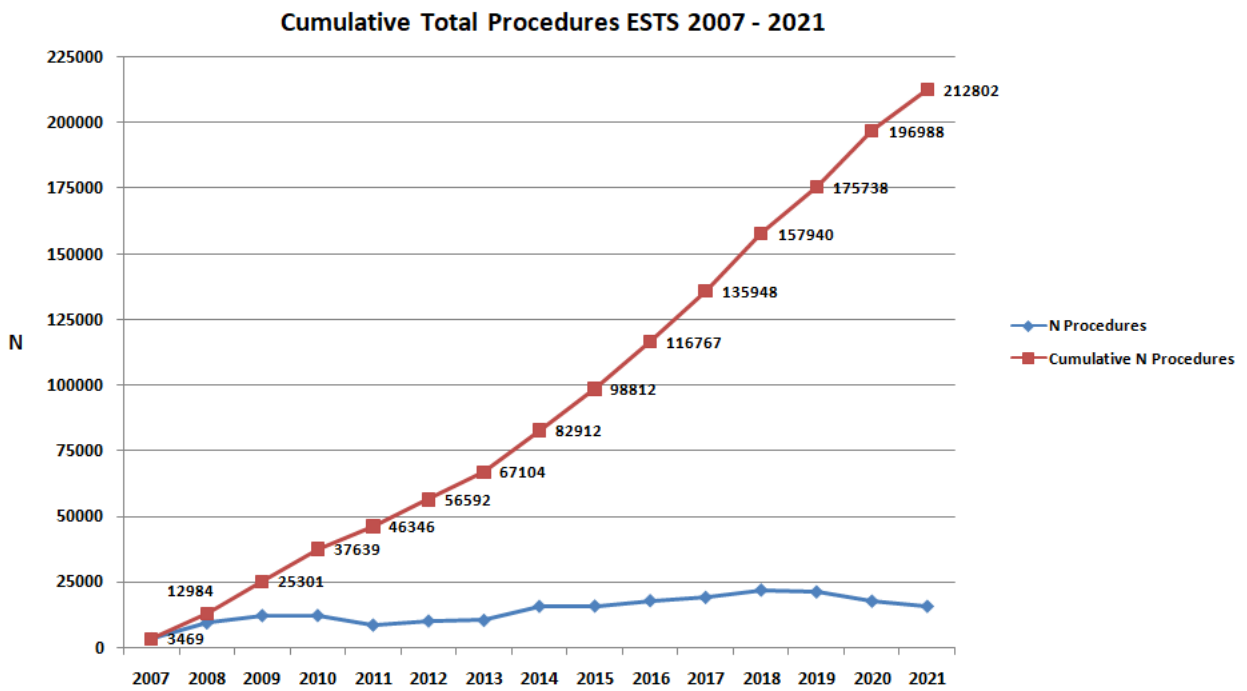
ROMANIA	DROBETA-TURNU SEVERIN	County Emergency Hospital
ROMANIA	TIMISOARA	Clinical Muncipal Emergency Hospital
SLOVAKIA	BRATISLAVA	University Hospital Bratislava , Slovachia
SLOVENIA	LJUBLJANA	University Medical Centre Ljubljana
SPAIN	BARCELONA	Hospital Clinic
SPAIN	BARCELONA	Sagrat Cor University Hospital
SPAIN	HEBRON	HG Vall d'Hebron
SPAIN	MADRID	H. Clinico San Carlos
SPAIN	MADRID	Hospital general Universitario Gregorio Maranon
SPAIN	MADRID	Ramon y Cajal University Hospital
SPAIN	NAVARRA	Clinica Universitaria De Navarra
SPAIN	SALAMANCA	University Hospital Salamanca
SPAIN	SEVILLA	HHUU Virgen del Rocio
SPAIN	VALENCIA	General University Hospital Valencia
SPAIN	SEVILLA	Hospital Virgen Macarena
SPAIN	PALMA	Hospital Universitari Son Espases
SPAIN	SAN SEBASTIAN	University Hospital Donostia
SWITZERLAND	ZURICH	UniversitätsSpital Zürich Klinik für Thoraxchirurgie
SWITZERLAND	ST. GALLEN	Klinik fur Thoraxchirurgie Kantonsspital St. Gallen
TURKEY	BURSA	Uludag University, School of Medicine
TURKEY	ISTANBUL	Istanbul School of Medicine
TURKEY	ISTANBUL	Istanbul University, Cerrahpasa Medical Faculty
TURKEY	ISTANBUL	Sureyyapasa Chest Disease & Thoracic Surgery Hospital
UK	EXETER	Royal Devon & Exeter NHS Foundation Trust
UK	LEEDS	St. James's University Hospital

PART 1

EUROPEAN DATABASE

**CUMULATIVE ACTIVITY (2007-2021)
(European units Only)**

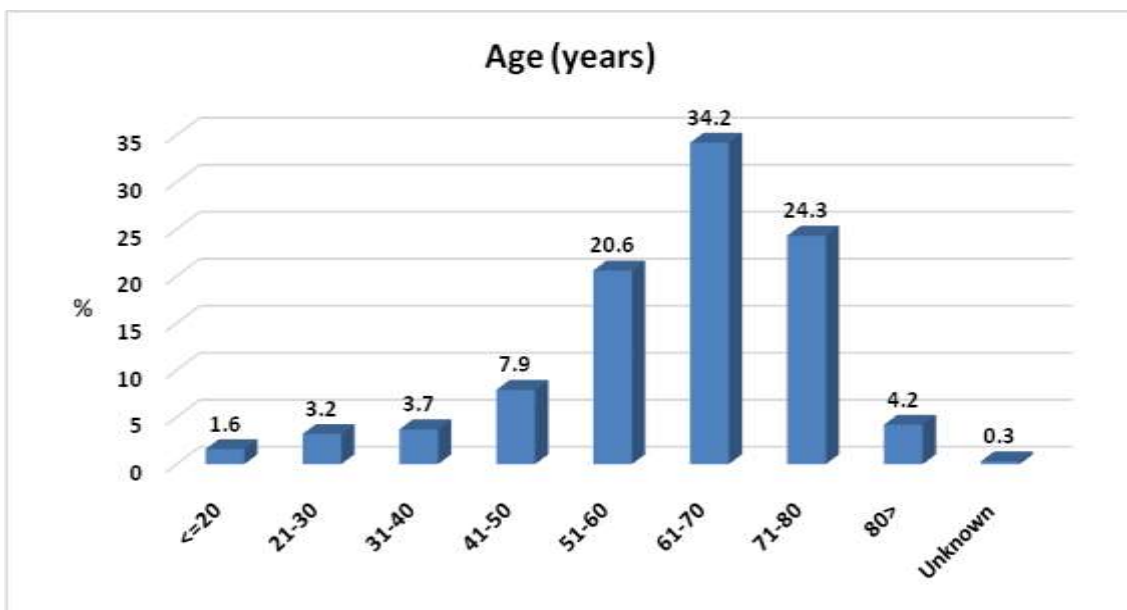
Growth of the ESTS Database 2007-21



Overall age and gender distributions

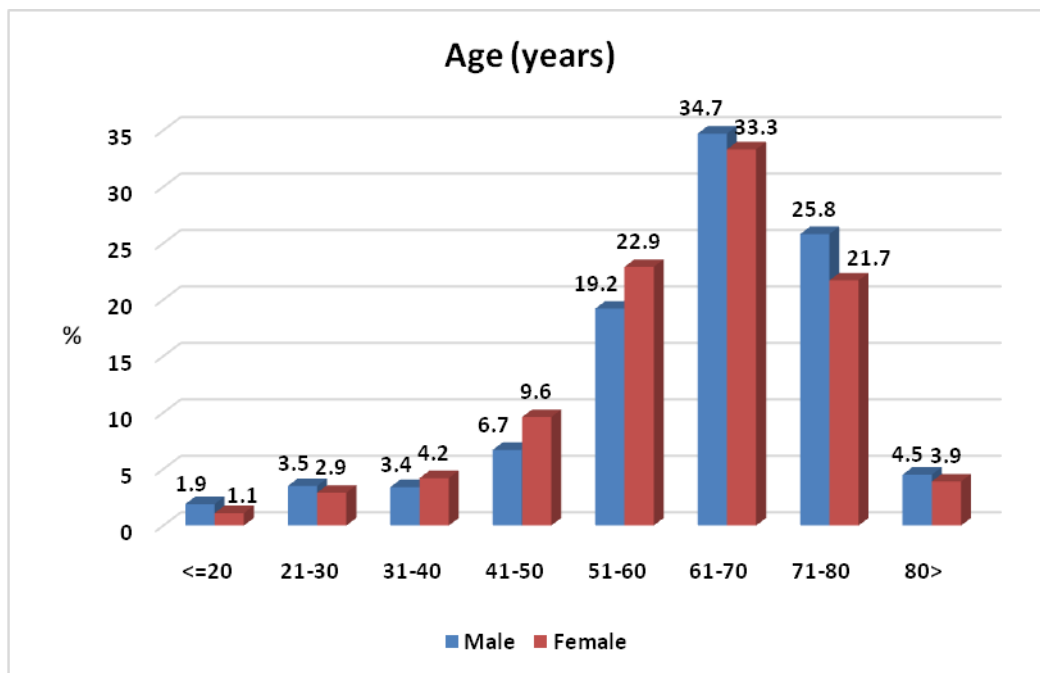
Age (years)

Age (years)	Occurrences	Percentages
<=20	3446	1.6
21-30	6894	3.2
31-40	7854	3.7
41-50	16697	7.9
51-60	43830	20.6
61-70	72768	34.2
71-80	51606	24.3
>80	8995	4.2
Unknown	712	0.3
Total	212802	100



Gender according to age distribution (years)

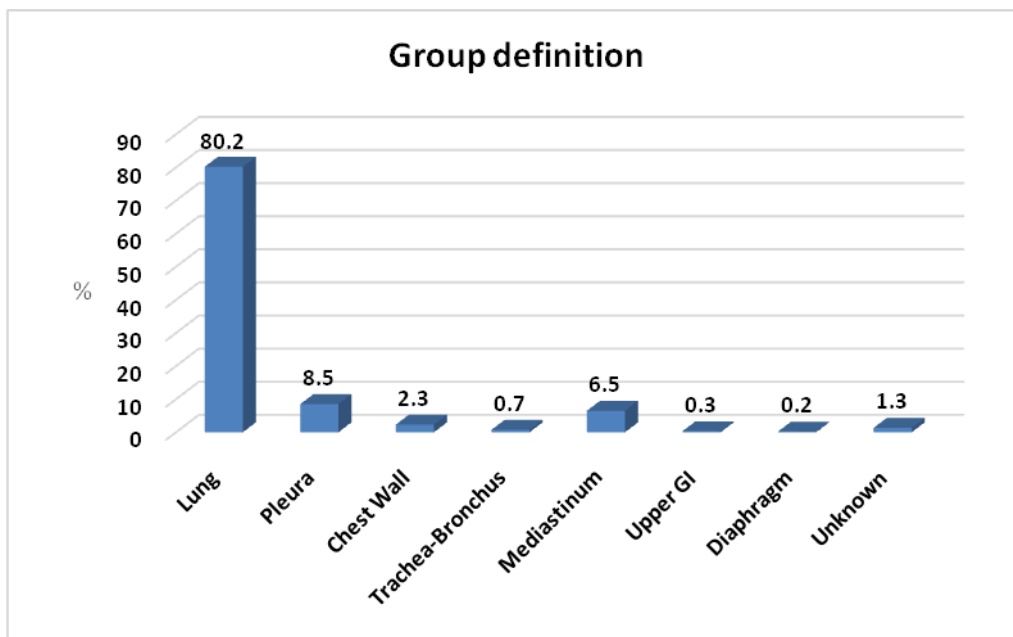
Age (years)	Male (%)	Female (%)
<=20	1.9	1.1
21-30	3.5	2.9
31-40	3.4	4.2
41-50	6.7	9.6
51-60	19.2	22.9
61-70	34.7	33.3
71-80	25.8	21.7
>80	4.5	3.9
Unknown	0.3	0.4



Total surgical activity within the entire dataset

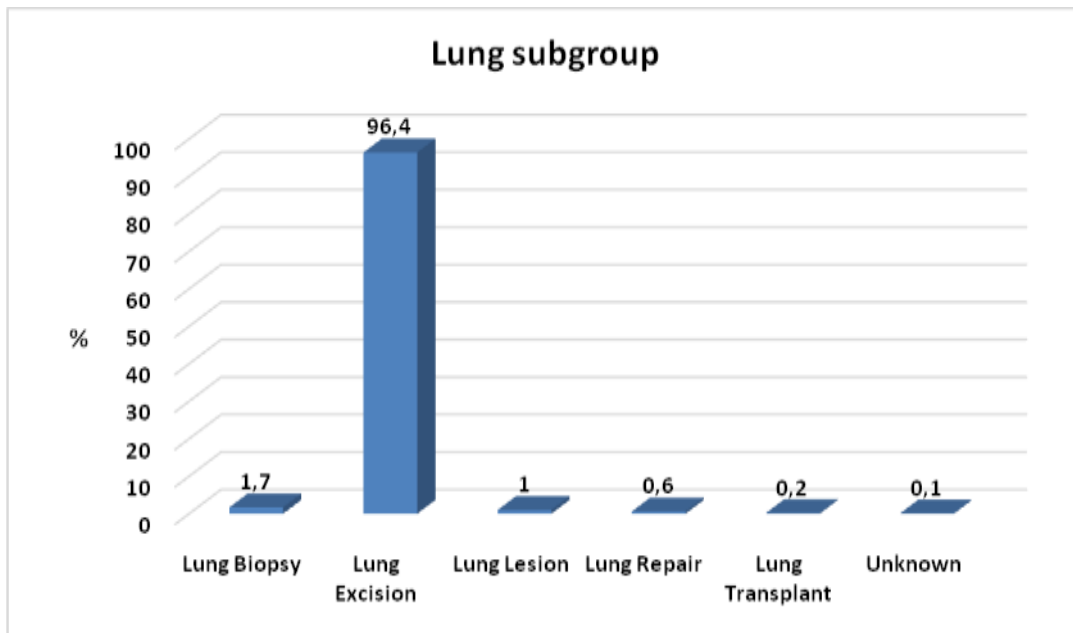
Group Definitions

Group Definition	Occurrences	Percent
Lung	170654	80.2
Pleura	18064	8.5
Chest Wall	4860	2.3
Trachea-Bronchus	1506	0.7
Mediastinum	13804	6.5
Upper GI	759	0.3
Diaphragm	403	0.2
Unknown	2752	1.3
Total	212802	100



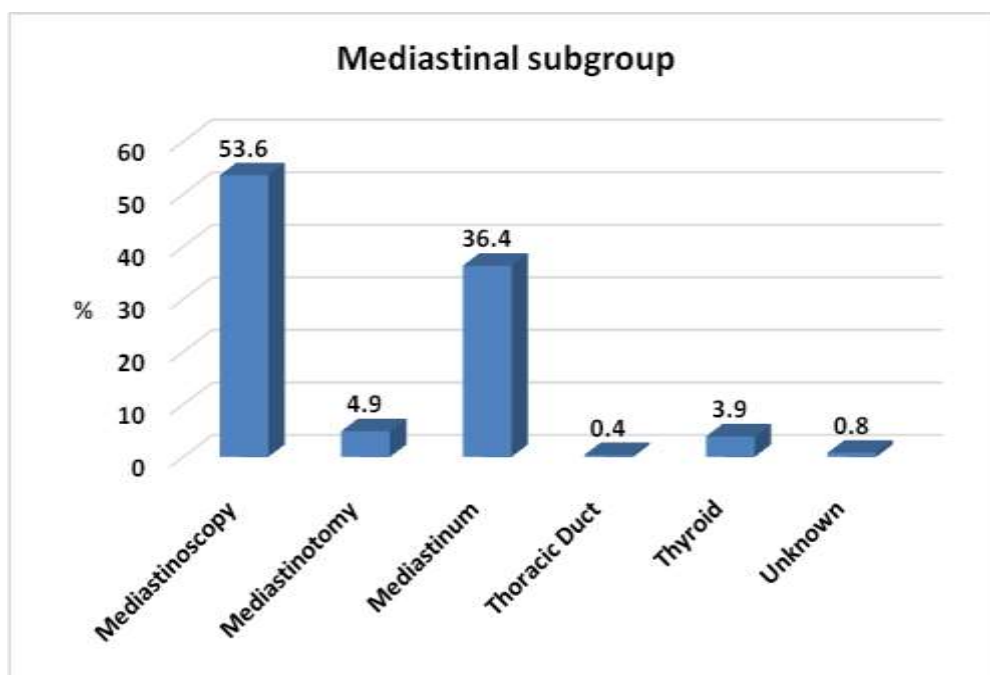
Lung Subgroup

	Occurrences	Percent
Lung Biopsy	2852	1.7
Lung Excision	164455	96.4
Lung Lesion	1681	1
Lung Repair	993	0.6
Lung Transplant	399	0.2
Unknown	274	0.1
Total	170654	100



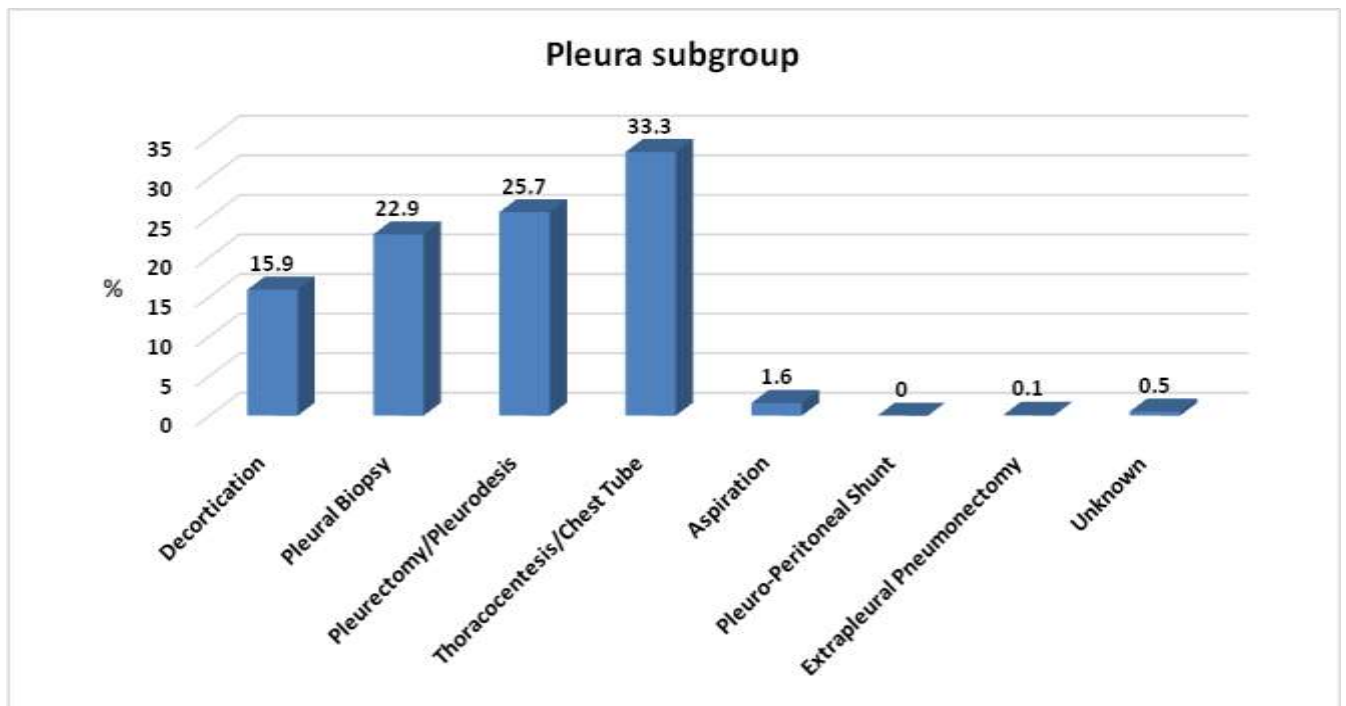
Mediastinum Subgroup

	Occurrences	Percent
Mediastinoscopy	7392	53.6
Mediastinotomy	656	4.8
Mediastinum	5059	36.6
Thoracic Duct	70	0.5
Thyroid	524	3.8
Unknown	103	0.7
Total	13804	100



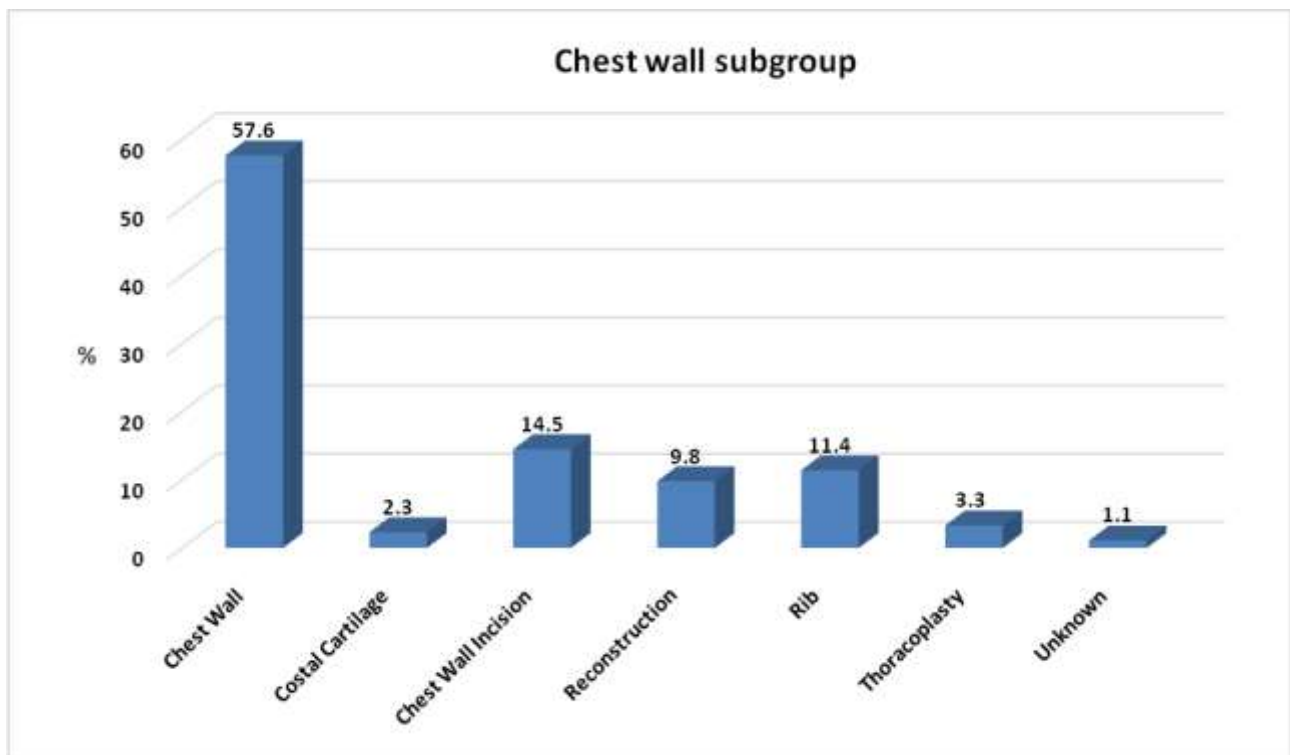
Pleura Subgroup

	Occurrences	Percent
Decortication	2877	15.9
Pleural Biopsy	4135	22.9
Pleurectomy/Pleurodesis	4634	25.7
Thoracocentesis/Chest Tube	6017	33.3
Aspiration	287	1.6
Pleuro-Peritoneal Shunt	9	0
Extrapleural Pneumonectomy	10	0.1
Unknown	95	0.5
Total	18064	100



Chest Wall Subgroup

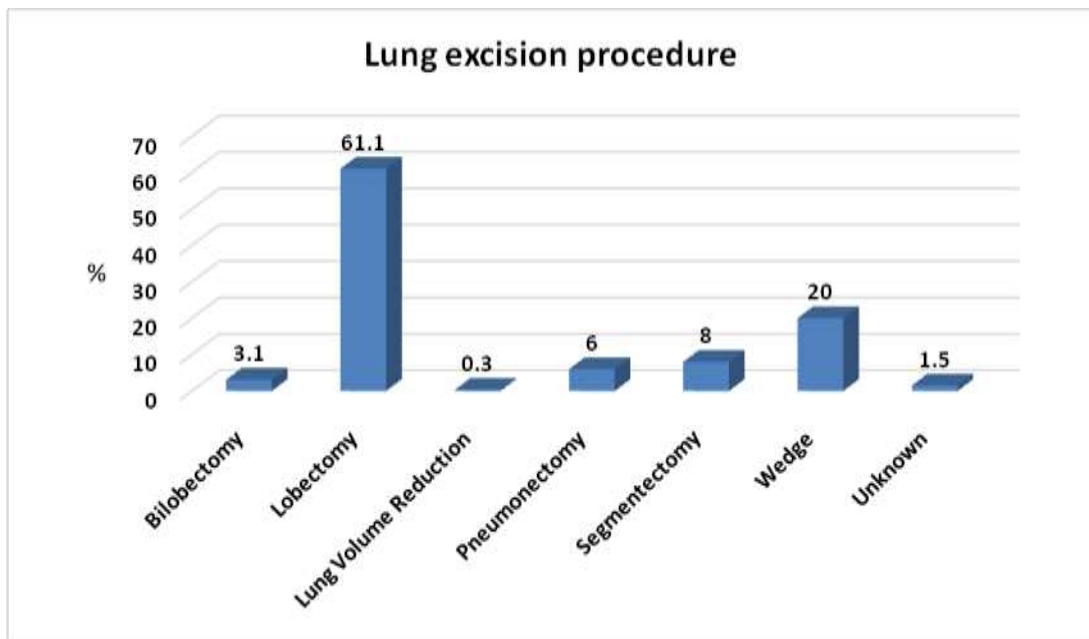
	Occurrences	Percent
Chest Wall	2800	57.6
Costal Cartilage	111	2.3
Chest Wall Incision	706	14.5
Reconstruction	475	9.8
Rib	555	11.4
Thoracoplasty	159	3.3
Unknown	54	1.1
Total	4860	100



Lung resections

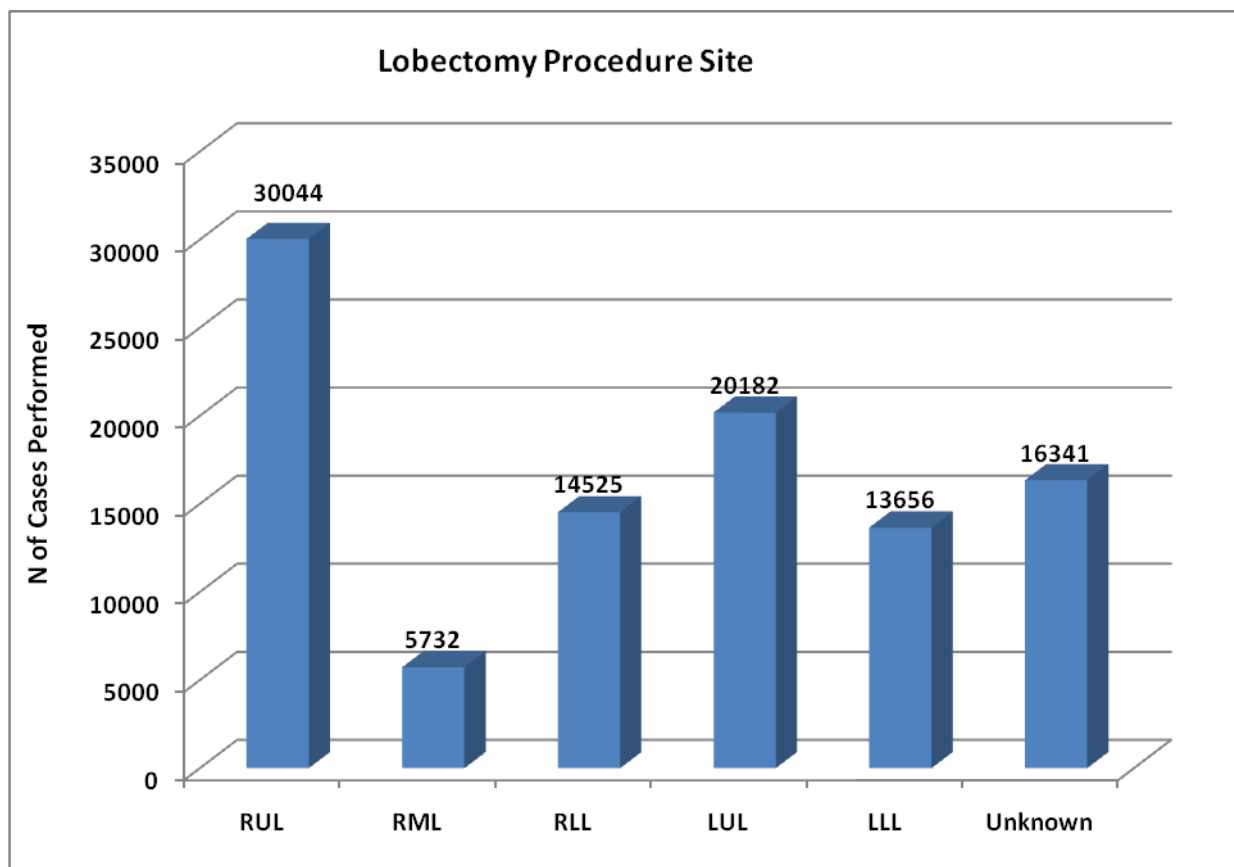
Types of lung resections performed, including all diagnoses

	Occurrences	Percent
Bilobectomy	5060	3.1
Lobectomy	100480	61.1
Lung Volume Reduction	564	0.3
Pneumonectomy	9812	6
Segmentectomy	13135	8
Wedge	32847	20
Unknown	2557	1.5
Total	164455	100



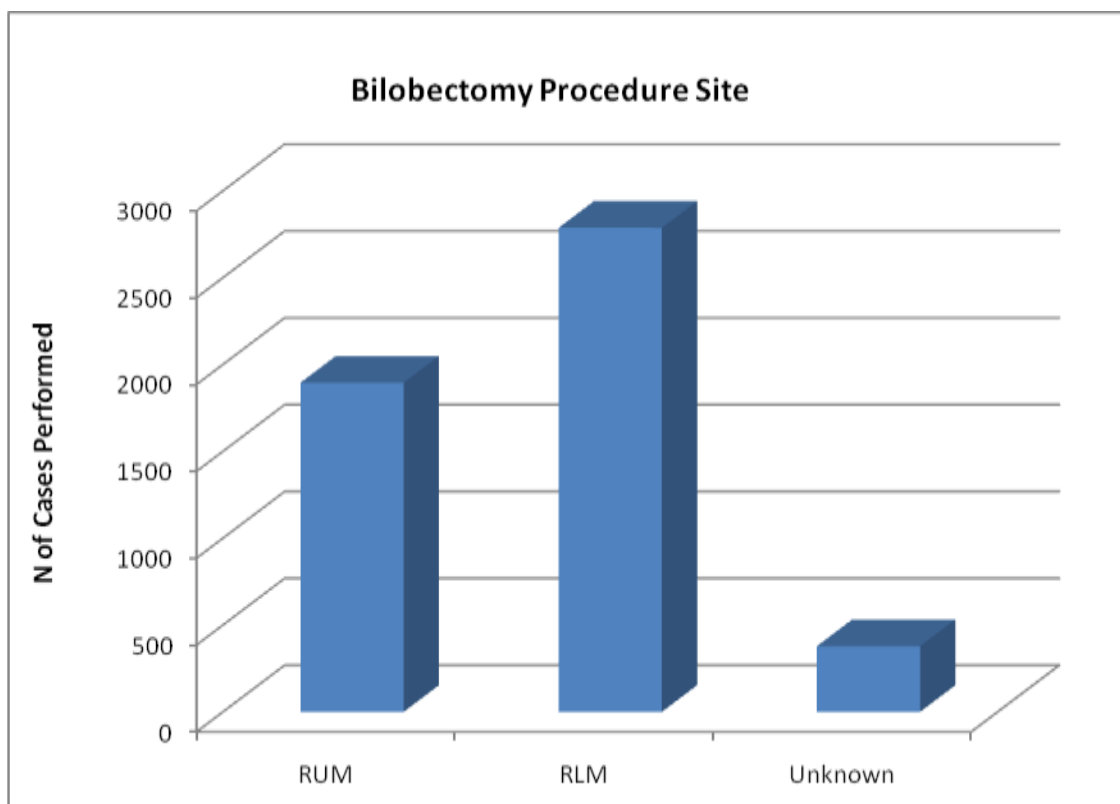
Distribution of lobectomy by site of resection

Lobectomy Procedure Site	Occurrences	Percent
RUL	30044	29.9
RML	5732	5.7
RLL	14525	14.4
LUL	20182	20.1
LLL	13656	13.6
Unknown	16341	16.3
Total	30044	29.9



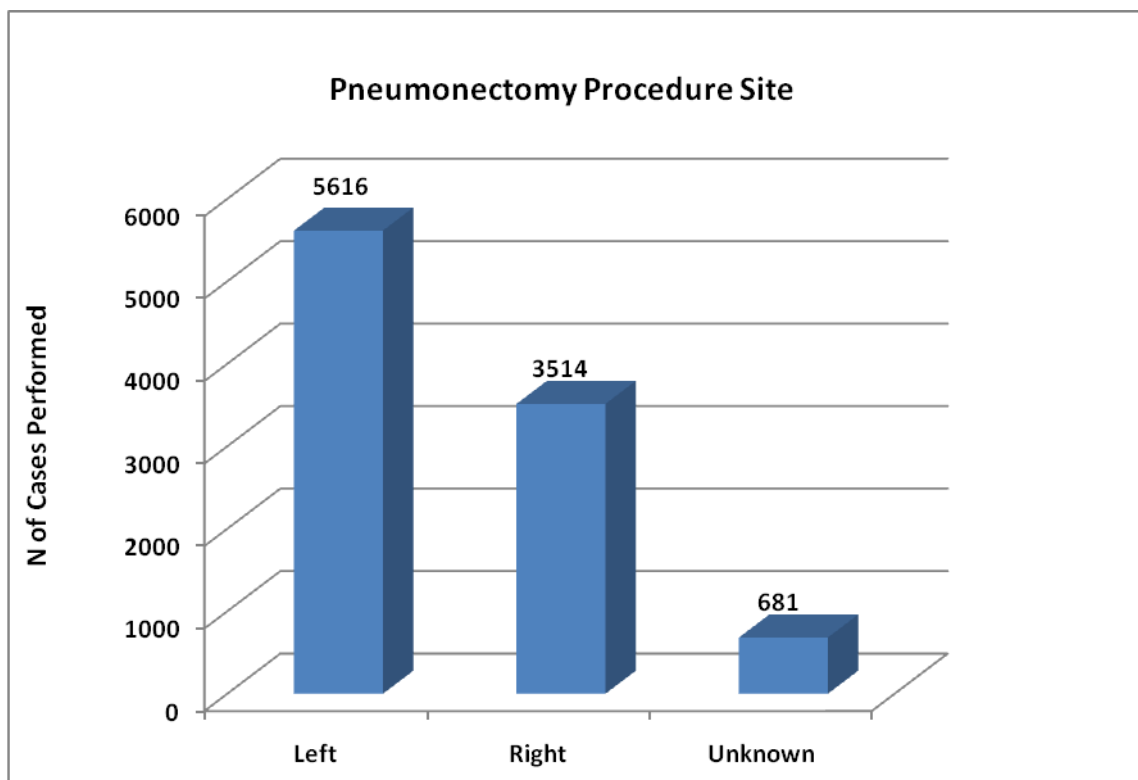
Distribution of bilobectomy by site of resection

Bilobectomy Procedure Site	Occurrences	Percent
RUM	1895	37.4
RLM	2787	55.1
Unknown	378	7.5
Total	5060	100



Distribution of pneumonectomy by side

Pneumonectomy Side	Occurrences	Percent
Left	5616	57.3
Right	3514	35.8
Unknown	681	6.9
Total	9811	100

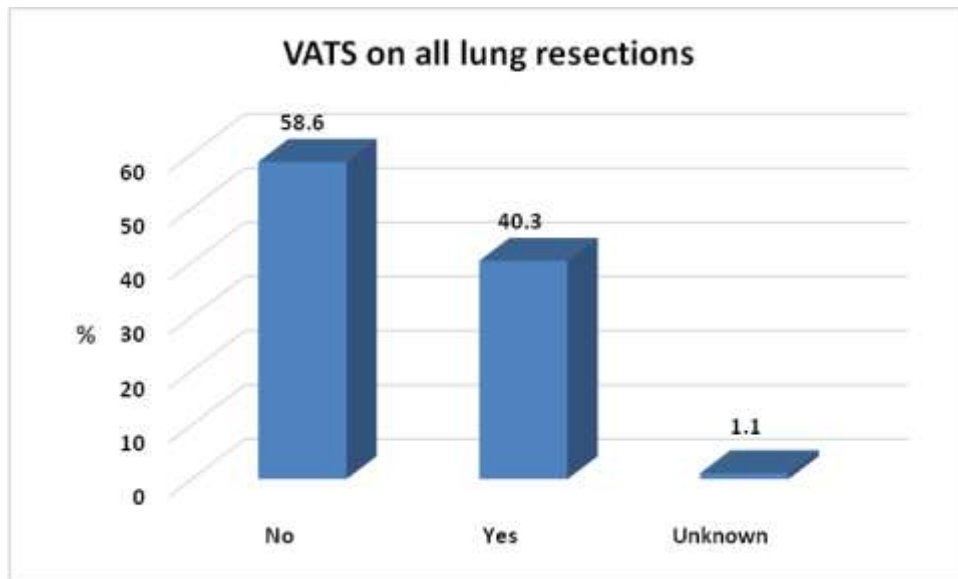


Pneumonectomy Qualifier	Occurrences	Percent
Alone	5706	58.1
Completion	465	4.7
Intrapericardial	859	8.8
Pleuropneumonectomy	239	2.4
Sleeve Resection	115	1.2
Diaphragm Resection	27	0.3
Atrial Resection	115	1.2
SVC Resection/Reconstruction	94	1
Vertebral Resection	162	1.6
Unknown	2030	20.7
Total	9812	100

VATS as a proportion of all lung resections

VATS	Occurrences	Percent (%)
No	96401	58.6
Yes	66179	40.3
Unknown	1875	1.1
Total	164455	100

Note the increase from 37.6% to 40.3!!!! Also a similar % of data completeness



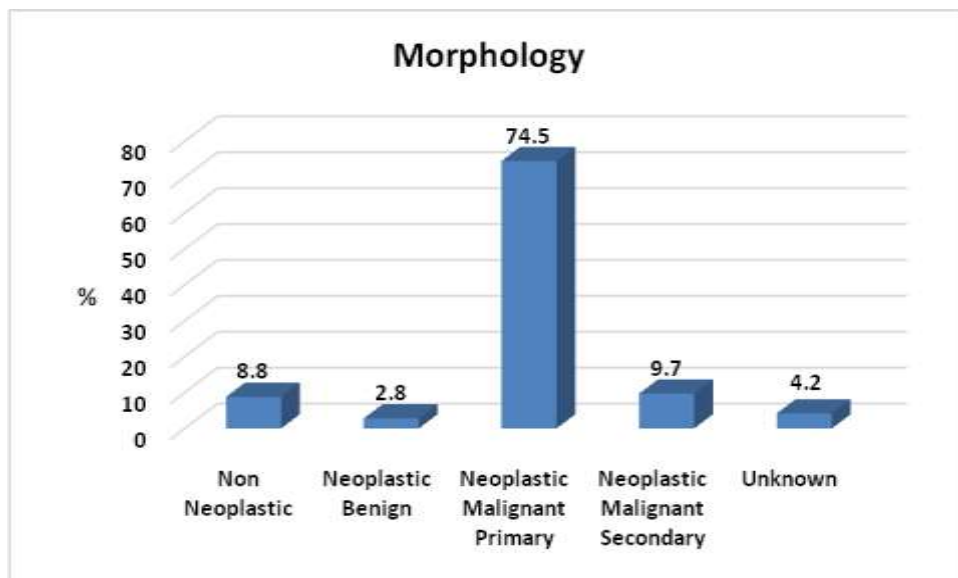
	No	Yes	Yes (%)
2007-2013	24768	2607	9.5
2014-2021	56247	6784	10.8
Total	81015	9391	10.4

VATS as a proportion of lobectomy

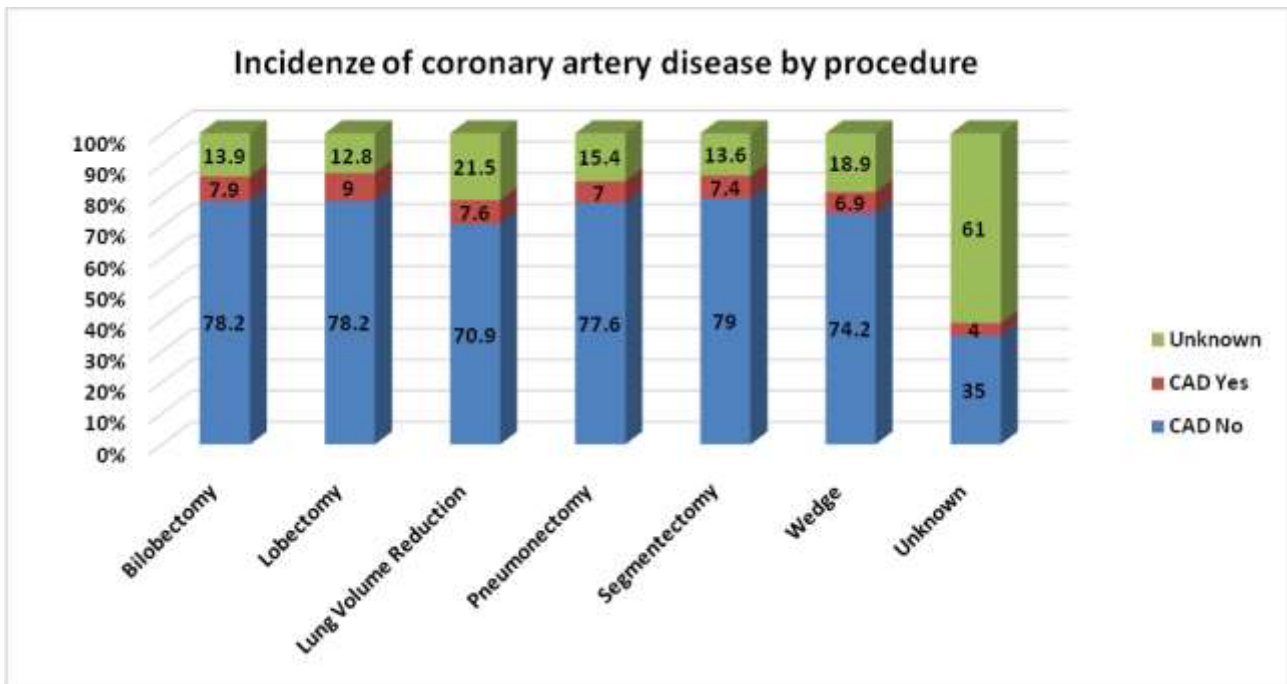
	No	Yes	Yes (%)
2007-2013	26970	2901	9.7
2014-2021	34861	34703	49.9
Total	61831	37604	37.8

Lung resections pathology

Morphology	Occurrences	Percent (%)
Non Neoplastic	14531	8.8
Neoplastic Benign	4657	2.8
Neoplastic Malignant Primary	122544	74.5
Neoplastic Malignant Secondary	15863	9.7
Unknown	6860	4.2
Total	164455	100

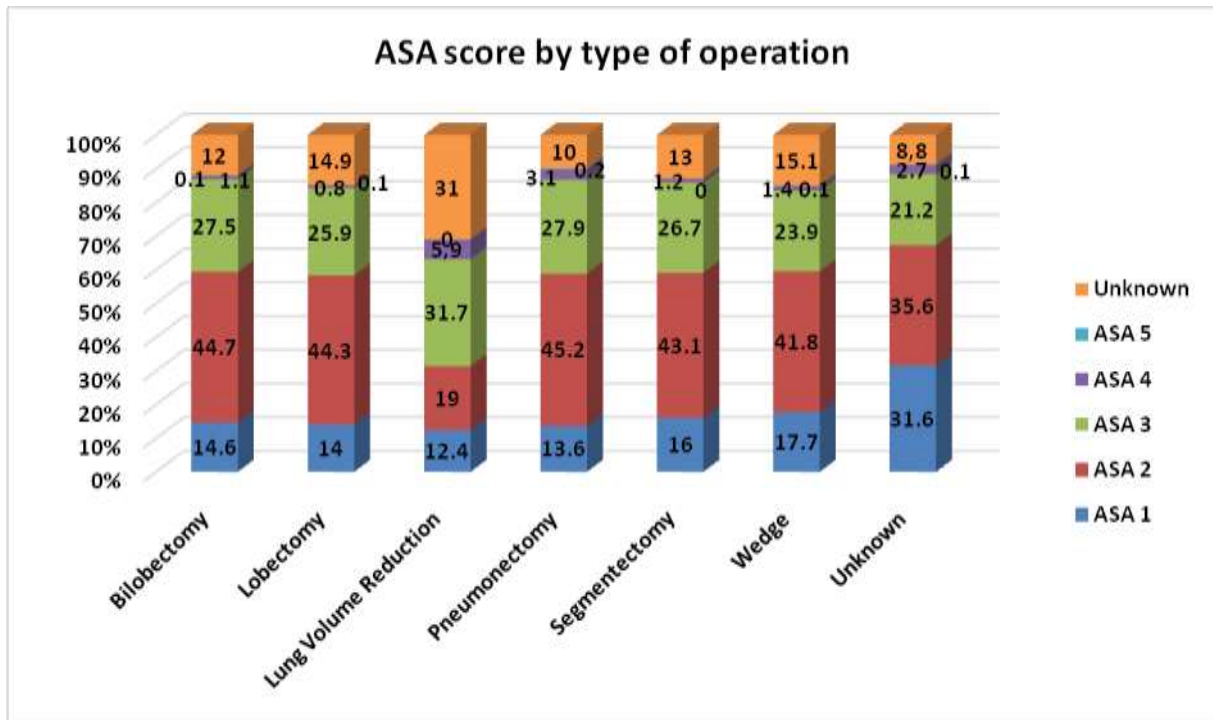


Incidence of coronary artery disease by procedure



Lung Excision Procedure	CAD NO	CAD YES	Unknown	Total
Bilobectomy	3955	399	706	5060
Lobectomy	78575	9065	12840	100480
Lung Volume Reduction	400	43	121	564
Pneumonectomy	7616	686	1510	9812
Segmentectomy	10377	973	1785	13135
Wedge	24384	2274	6189	32847
Unknown	896	102	1559	2557
Total	126203	13542	24710	164455

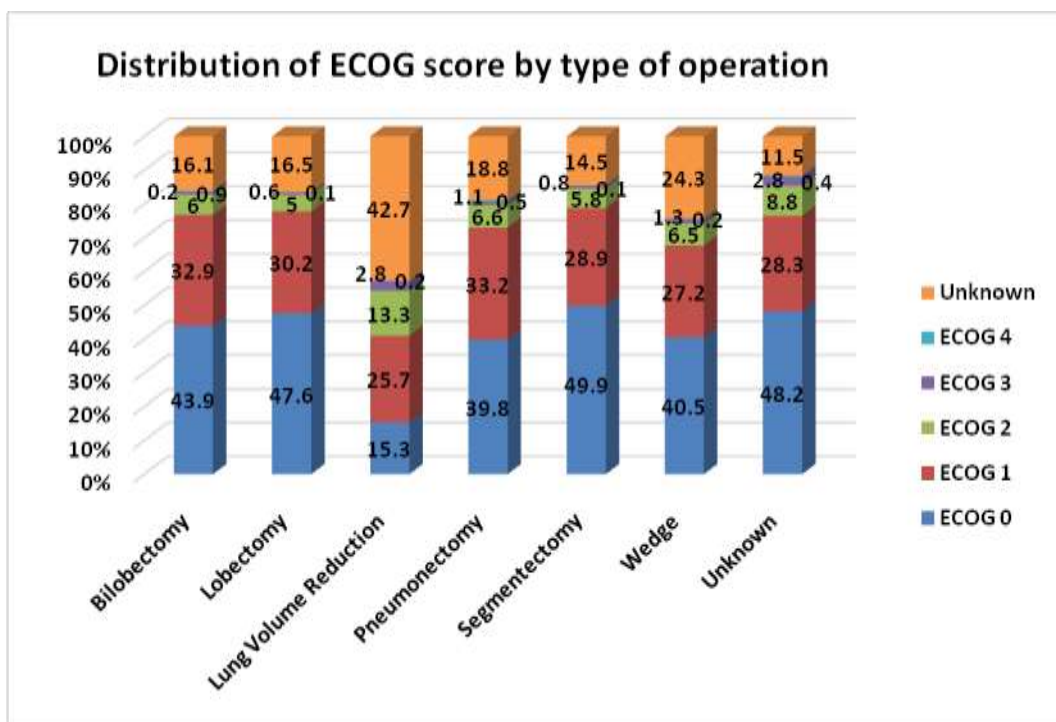
Distribution of ASA score by type of operation



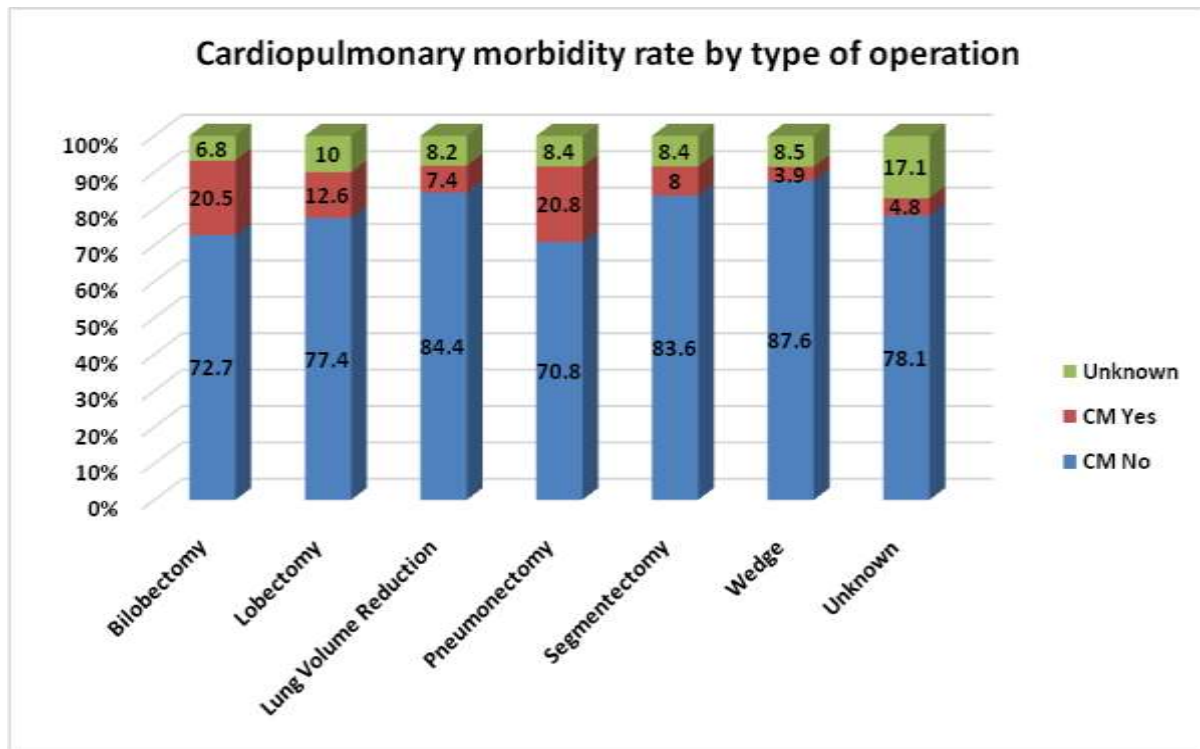
Lung Excision Procedure	ASA 1	ASA 2	ASA 3	ASA 4	ASA 5	Unknown	Total
Bilobectomy	739	2262	1394	56	3	606	5060
Lobectomy	14100	44500	26015	834	41	14990	100480
Lung Volume Reduction	70	107	179	33	0	175	564
Pneumonectomy	1338	4434	2734	299	23	984	9812
Segmentectomy	2098	5665	3510	153	1	1708	13135
Wedge	5825	13725	7861	464	23	4949	32847
Unknown	809	910	542	69	3	224	2557
Total	24979	71603	42235	1908	94	23636	164455

Distribution of ECOG score by type of operation

Lung Excision Procedure	ECOG 0	ECOG 1	ECOG 2	ECOG 3	ECOG 4	Unknown	Total
Bilobectomy	2220	1667	305	46	10	812	5060
Lobectomy	47779	30303	5070	611	99	16618	100480
Lung Volume Reduction	86	145	75	16	1	241	564
Pneumonectomy	3901	3262	651	111	44	1843	9812
Segmentectomy	6556	3793	762	108	16	1900	13135
Wedge	13309	8925	2135	430	76	7972	32847
Unknown	1232	723	226	71	10	295	2557
Total	75083	48818	9224	1393	256	29681	164455



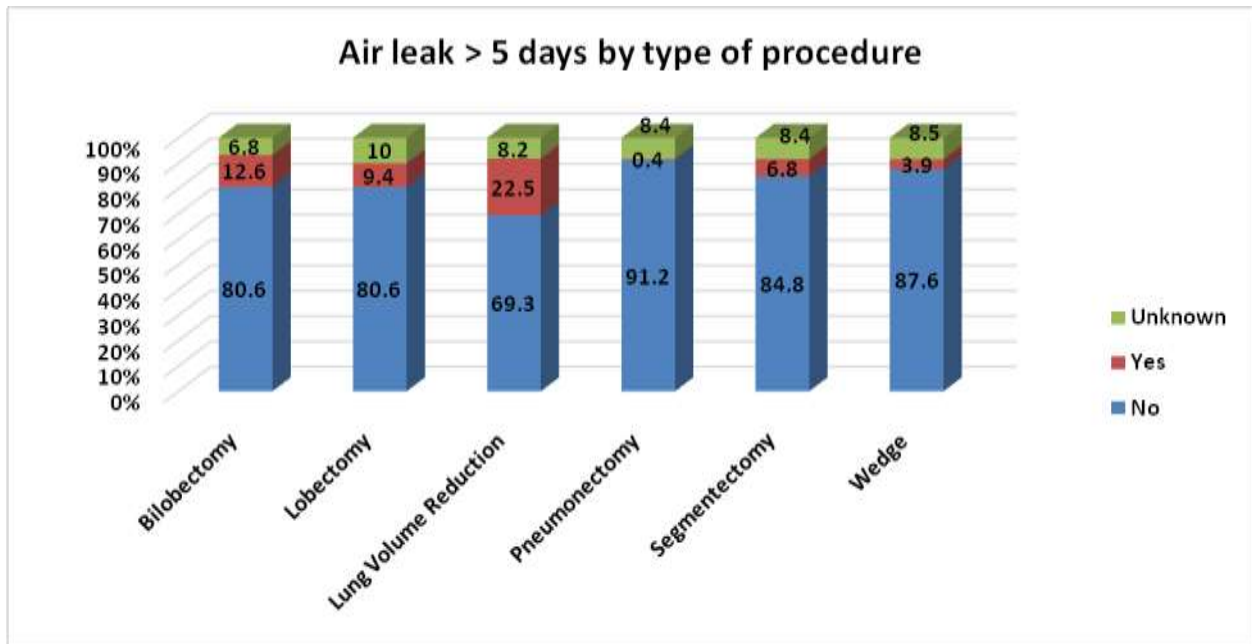
Cardiopulmonary morbidity rate in different types of lung resections



	CM No	CM No (%)	CM Yes	CM Yes(%)	Unknown	Unknown (%)	Total
Bilobectomy	3677	72.7	1038	20.5	345	6.8	5060
Lobectomy	77716	77.4	12690	12.6	10074	10	100480
Lung Volume Reduction	476	84.4	42	7.4	46	8.2	564
Pneumonectomy	6945	70.8	2046	20.8	821	8.4	9812
Segmentectomy	10979	83.6	1058	8	108	8.4	13135
Wedge	28784	87.6	1270	3.9	2793	8.5	32847
Unknown	1996	78.1	124	4.8	437	17.1	2557
Total	130573		16712		15614		164455

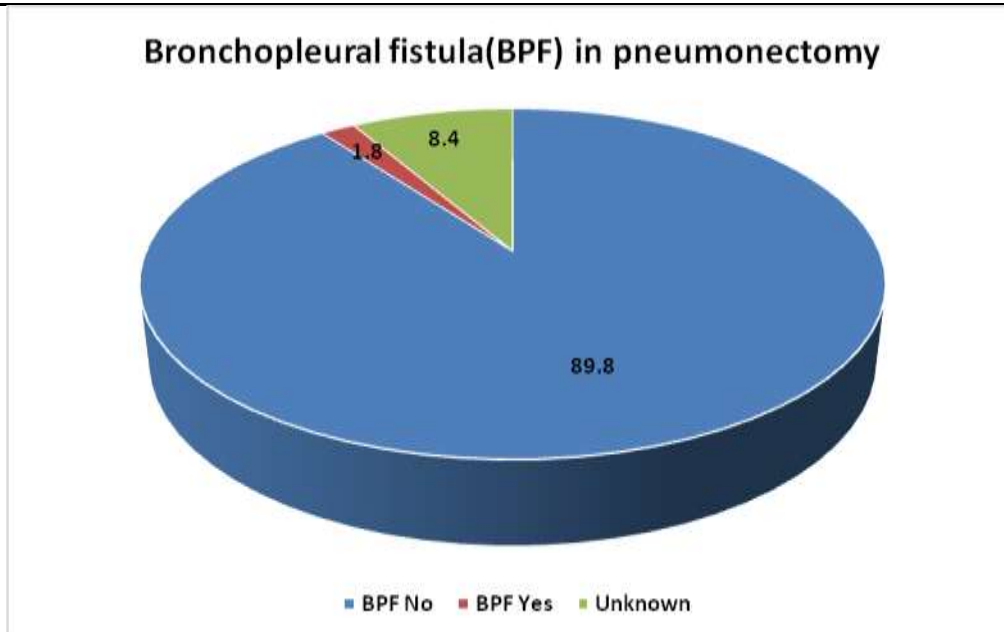
Incidence of prolonged air leak (> 5days) in different types of lung resections

Lung Excision - PROCEDURE	Air Leak > 5 days		
	No (%)	Yes (%)	Unknown (%)
Bilobectomy	80.6	12.6	6.8
Lobectomy	80.6	9.4	10
Lung Volume Reduction	69.3	22.5	8.2
Pneumonectomy	91.2	0.4	8.4
Segmentectomy	84.8	6.8	8.4
Wedge	87.6	3.9	8.5



Incidence of bronchopleural fistula (BPF) in pneumonectomy

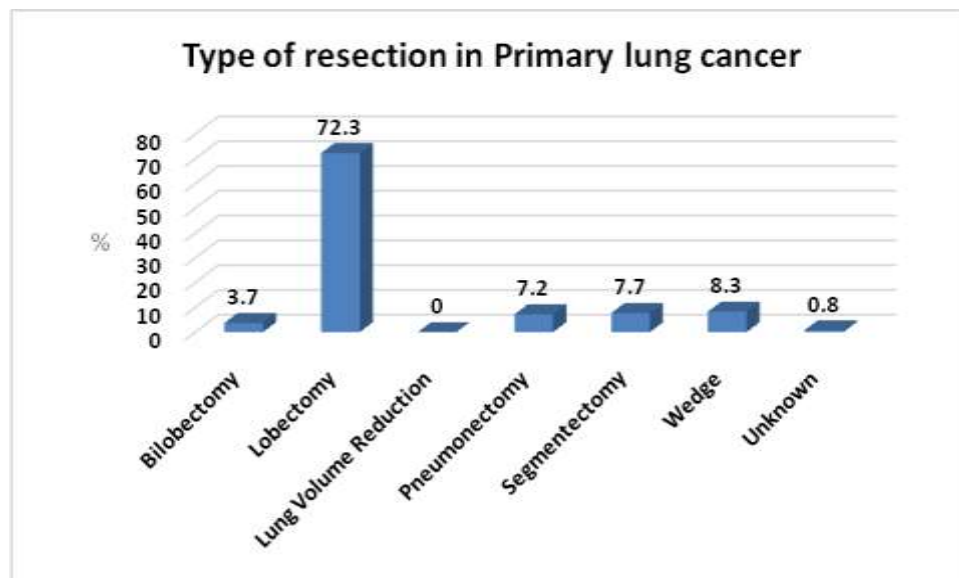
Bronchopleural fistula	BPF No	BPF Yes	Unknown	Total
Pneumonectomy (N)	8816	175	821	9812
Pneumonectomy (%)	89.8	1.8	8.4	100



Primary lung cancer

Lung resection for primary lung cancer: Types of procedures

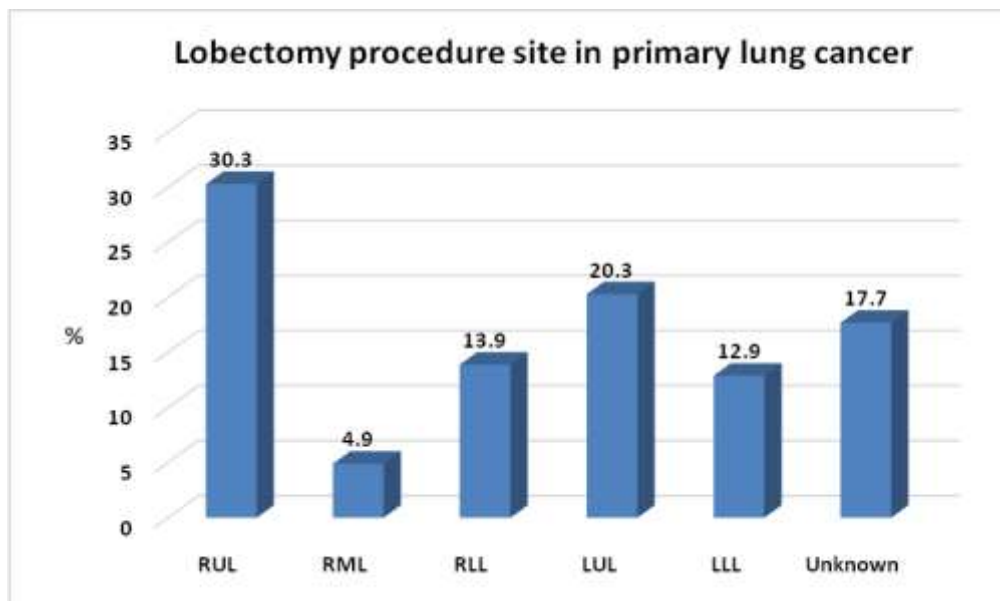
	Occurrences	Percent
Bilobectomy	4568	3.7
Lobectomy	88612	72.3
Lung Volume Reduction	16	0
Pneumonectomy	8791	7.2
Segmentectomy	9409	7.7
Wedge	10133	8.3
Unknown	1015	0.8
Total	122544	100



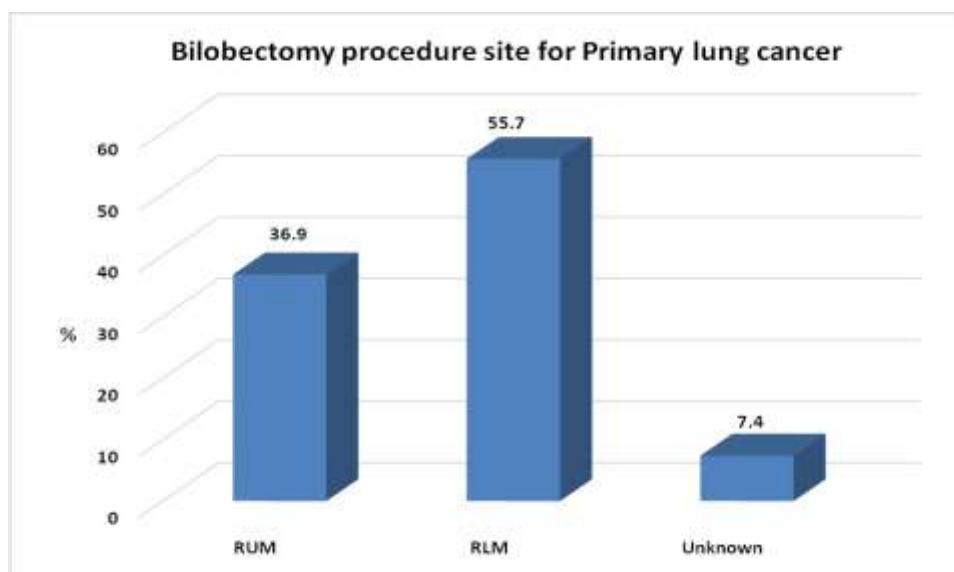
Bilobectomy – Lobectomy qualifier	Occurrences	Percent
Alone	80759	86.7
Chest Wall	3370	3.6
Superior Sulcus Tumor	502	0.5
Sleeve	2923	3.1
Diaphragm Resection	96	0.1
Atrial Resection	76	0.1
SVC Resection/Reconstruction	82	0.1
Vertebral Resection	375	0.4
Unknown	4982	5.4
Total	93165	100

Distribution of lobectomy/bilobectomy by site of resection

Lobectomy procedure site	Occurrences	Percent
RUL	26818	30.3
RML	4349	4.9
RLL	12368	13.9
LUL	17982	20.3
LLL	11408	12.9
Unknown	15687	17.7
Total	88612	100



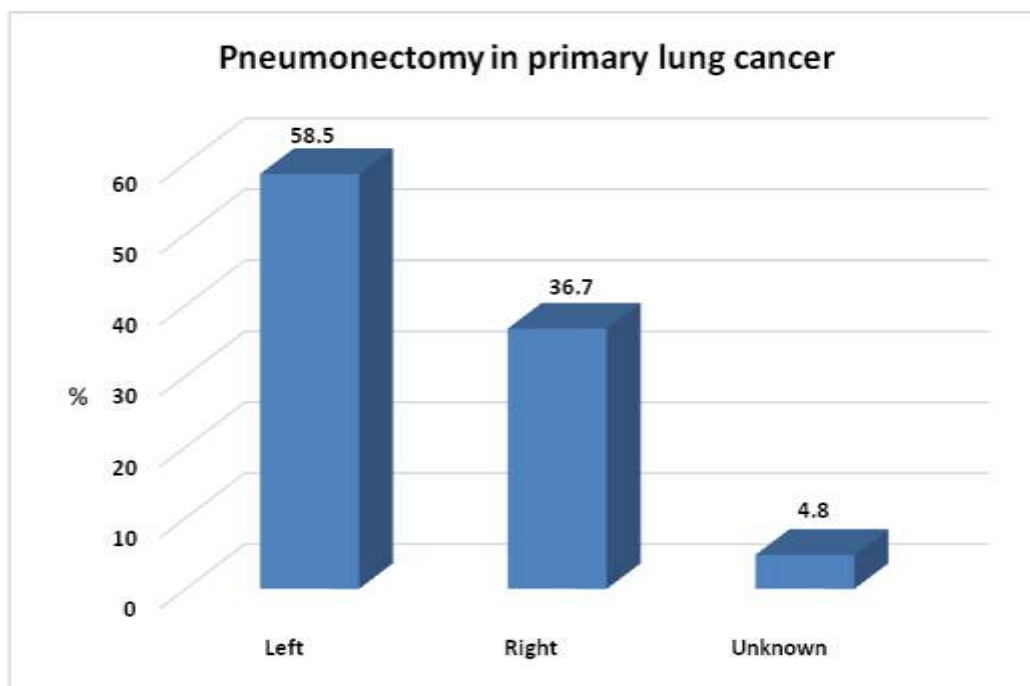
Bilobectomy procedure site	Occurrences	Percent
RUM	1684	36.9
RLM	2547	55.7
Unknown	337	7.4
Total	4568	100



Distributions of pneumonectomy

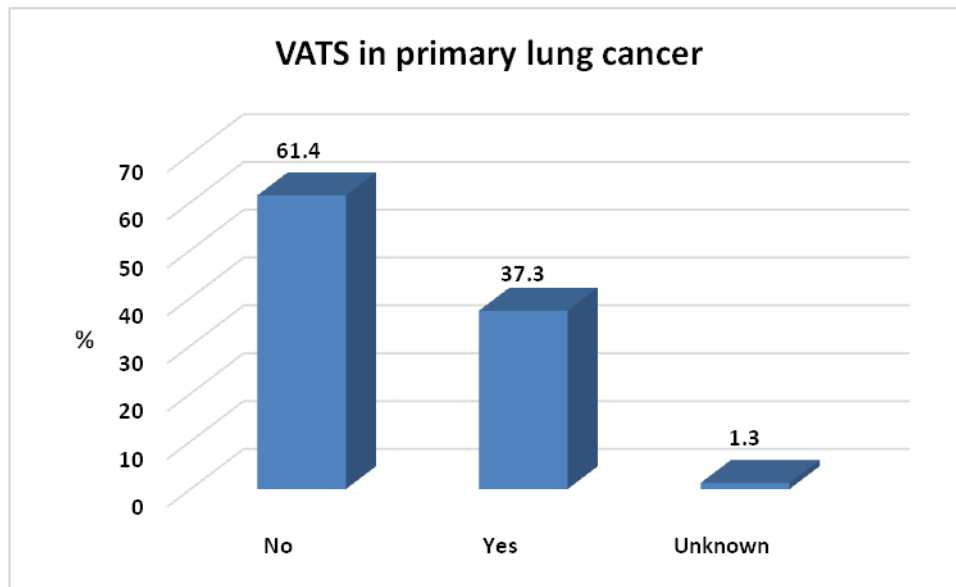
Pneumonectomy Qualifier	Occurrences	Percent
Alone	5167	58.8
Completion	372	4.2
Intrapericardial	760	8.6
Pleuropneumonectomy	189	2.1
Sleeve Resection	111	1.3
Diaphragm Resection	15	0.2
Atrial Resection	112	1.3
SVC Resection/Reconstruction	94	1.1
Vertebral Resection	158	1.8
Unknown	1813	20.6
Total	8791	100

Pneumonectomy side	Occurrences	Percent
Left	5145	58.5
Right	3227	36.7
Unknown	418	4.8
Total	8790	100



Distribution of VATS procedures in total lung resections

VATS	Occurrences	Percent
No	75202	61.4
Yes	45713	37.3
Unknown	1629	1.3
Total	122544	100



Distributions of VATS procedures in lobectomy/bilobectomy

VATS	Occurrences	Percent
No	57883	62.1
Yes	34331	36.9
Unknown	966	1
Total	93180	100

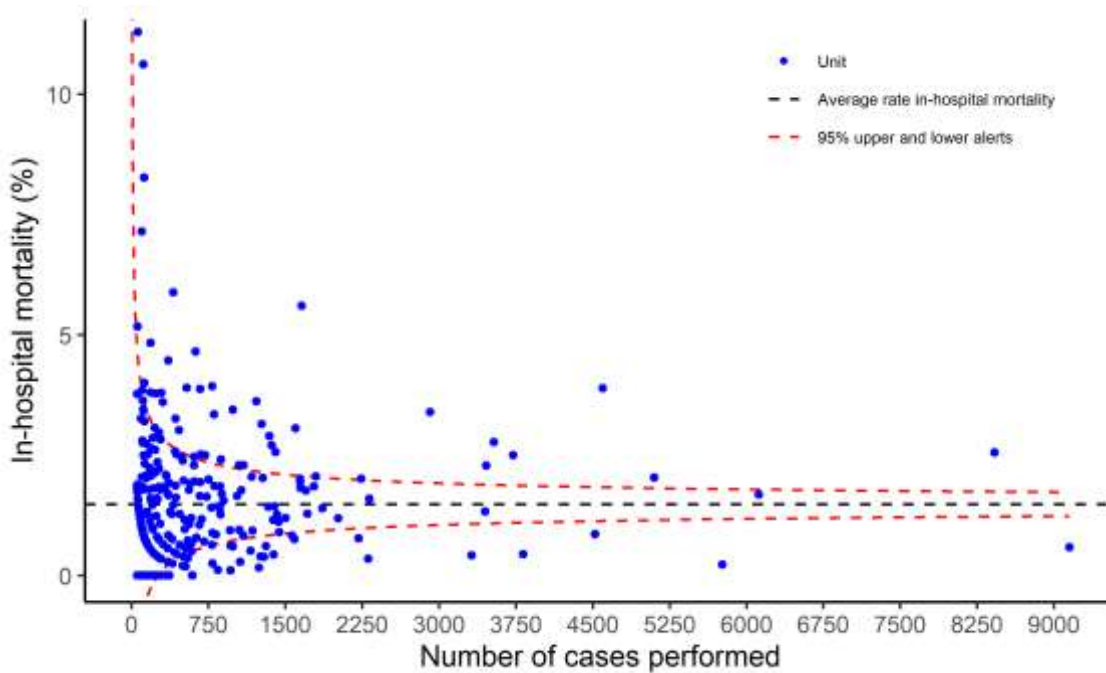
Unadjusted in-hospital mortality rates in primary lung cancer resections

Outcome at Discharge - Died in Hospital	N	Died in Hospital	Percent(%)
Bilobectomy	4307	146	3.4
Lobectomy	82872	1054	1.3
Lung Volume Reduction	11	0	0
Pneumonectomy	8309	452	5.4
Segmentectomy	8525	70	0.8
Wedge	9593	83	0.9
Total	113617	1805	1.6

Overall unadjusted in-hospital mortality calculated in the total dataset

(Only centres with at least N>50 procedures were included)

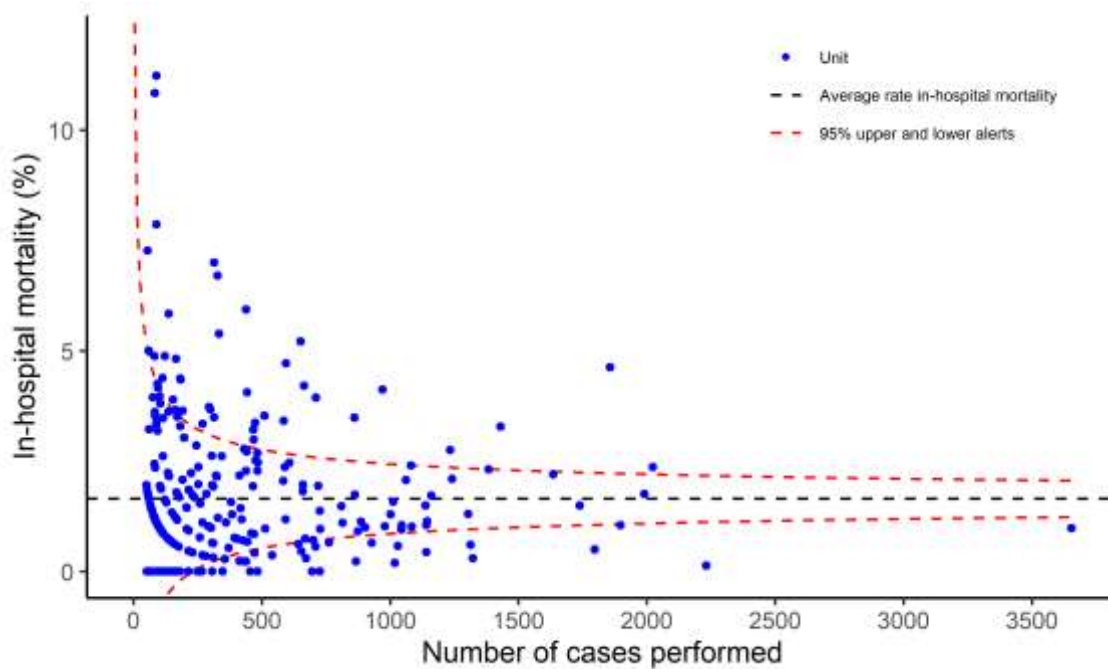
Please note that the majority of the units are within the limits. Around 13% of the Units are above the 95% upper limit whereas the 10% are below the 95% lower limit.



Overall unadjusted in-hospital mortality calculated for the major lung resections

(Only centres with at least N>50 major lung resections were included)

Please note that most of the units are within the limits. Around 13% of the Units are above the 95% upper limit whereas the 10% are below the 95% lower limit.

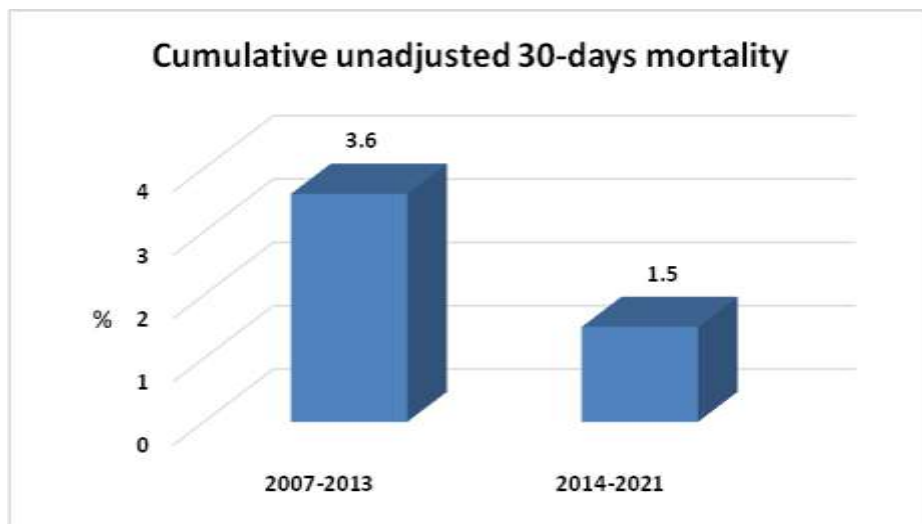


Comparisons of outcomes between 2007-2013 vs 2014-2021 in the total dataset

* Due to missing data, the 30-day mortality was only evaluated in 81,904 patients, leaving 89,809 patients out

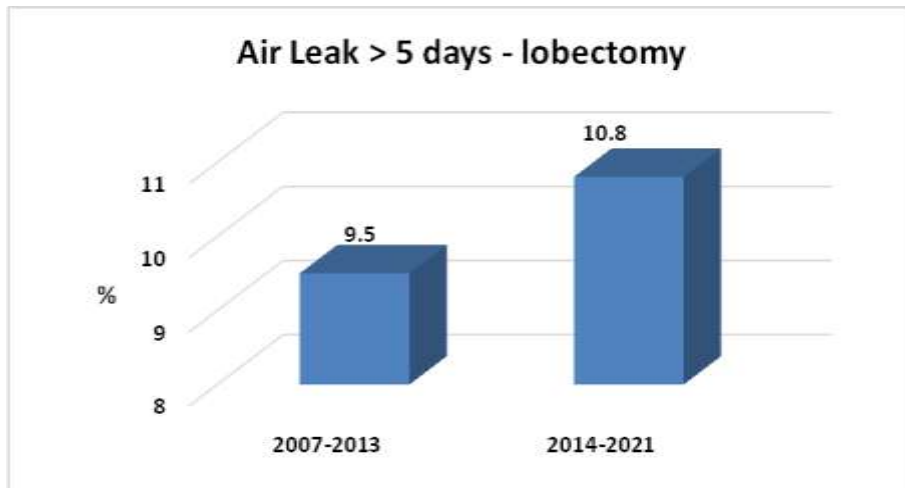
Cumulative non-adjusted 30-day mortality

Cumulative non-adjusted 30-day mortality	Alive	Died	Died Percent
2007-2013	27782	1033	3.6
2014-2021	79589	1197	1.5
Total	107371	2230	2



Prolonged air leak **(LOBECTOMY ONLY)**

Air leak > 5 Days	No	Yes	Yes(%)
2007-2013	24768	2607	9.5
2014-2021	56247	6784	10.8
Total	81015	9391	10.4



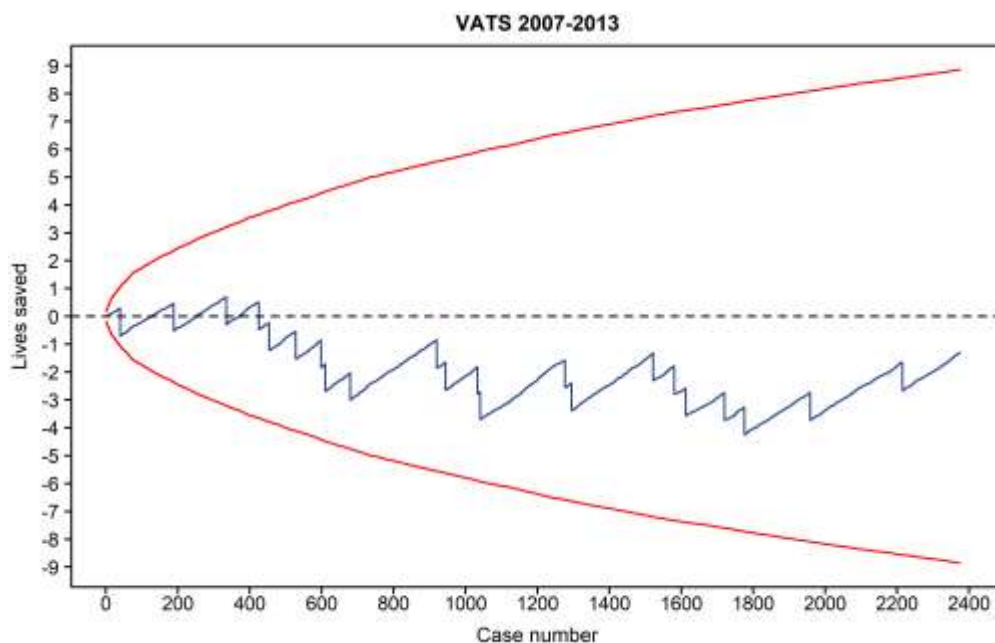
Hospital Mortality trending presented as CUSUM plots

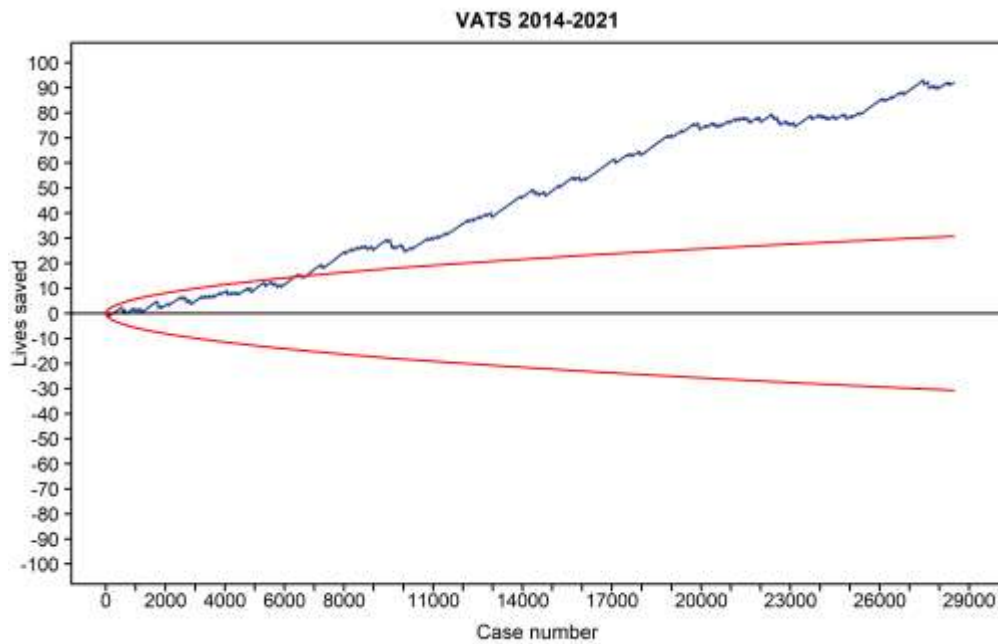
VATS CUSUM PLOTS

Cumulative sum (CUSUM) techniques offer the possibility of checking a process along time and knowing if its quality is kept constant, improves or deteriorates. In the last case, corrective measures can be implemented and their efficacy investigated. We have used risk-adjusted expected minus observed CUSUM charts in this report. The results of the analysis are presented in graphs, where the horizontal axis represents the cases over time and the vertical axis shows the difference between the calculated risk of the outcome for a single individual and its occurrence.

In the next figures, risk-adjusted CUSUM graphs for hospital mortality are presented for non-extended lobectomy performed through VATS or open approach in two different periods of time: 2007-2013 and 2014-2021

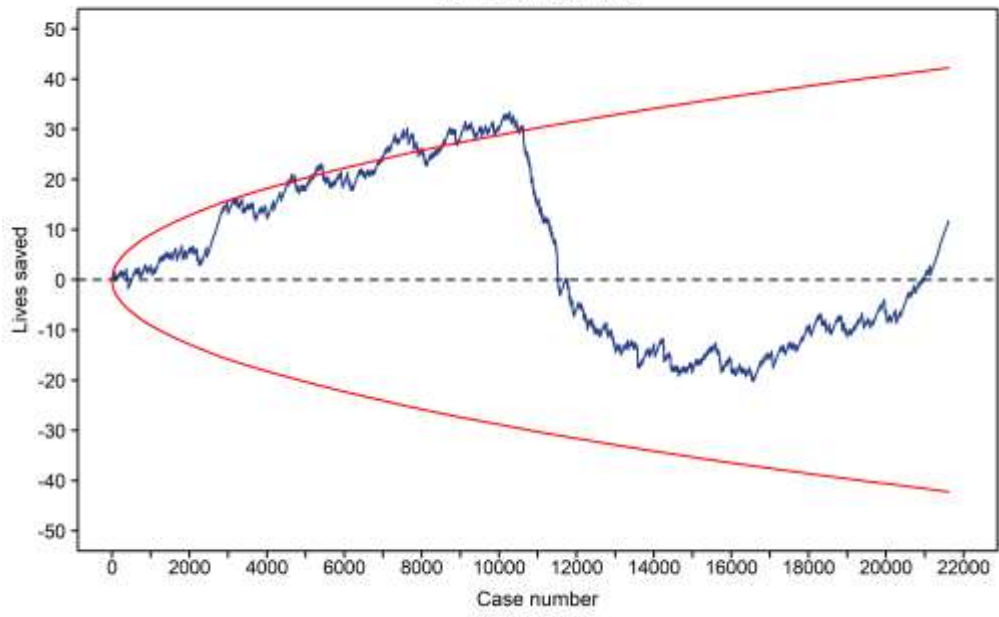
In the case of VATS, the first timeframe shows some variation around the zero for the first 400 cases and a slight mortality raise in the following cases. In the period 2014-2021, a steady decrease in mortality is detected, especially after the first 6000 procedures. The graph stabilizes around 70-80 lives saved between 20000 and 25000 procedures, but it continues the upward trend thereafter.



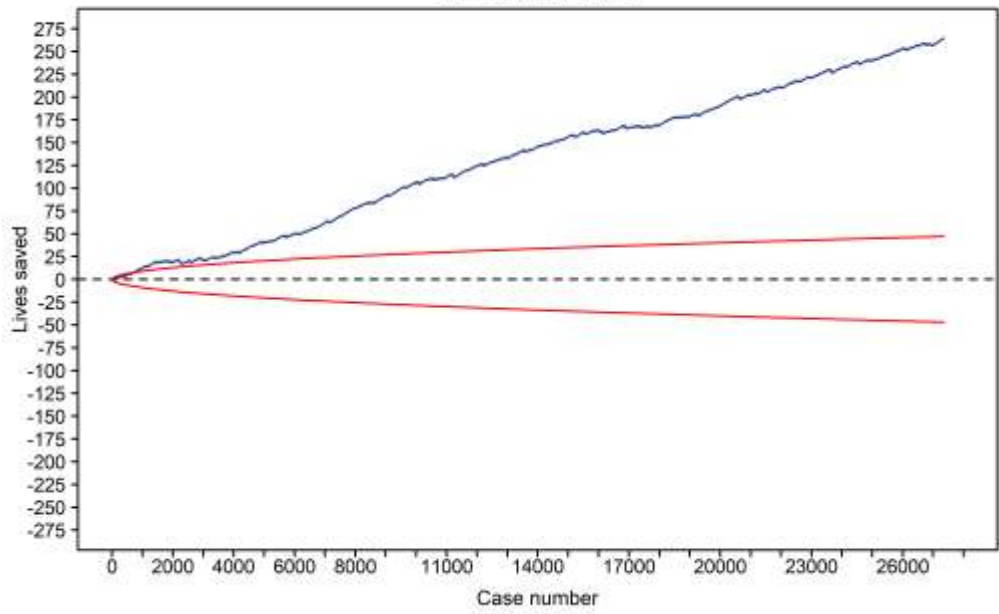


For cases not approached by VATS in the first time period, the graph shows a sharp decrease in mortality for the first 11000 procedures followed by a drop in lives saved for the following 5000 procedures, probably meaning that the easiest cases were shifted to VATS in most institutions. A subsequent increase in lives saved is shown from case 17000 onwards. After 2014 no VATS procedures resulted in a continuous and sharp improve of hospital mortality.

NO VATS 2007-2013



NO VATS 2014-2021



PART 2

UNITS-SPECIFIC ACTIVITY

&

COMPARATIVE ANALYSIS

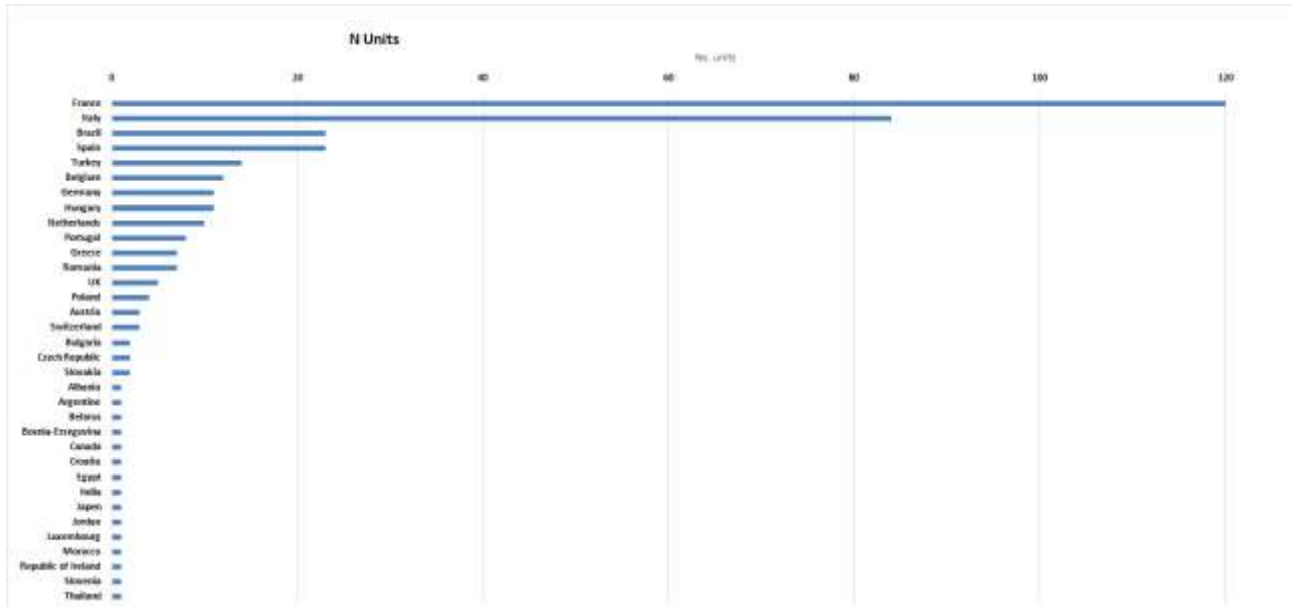
BETWEEN CONTRIBUTING UNITS

(2007-2021)

(European units Only)

*Only units contributing more than 150 lung resections **performed in the last three** years were included*

Number of Units enrolled in the ESTS database as of December 2021, by Country



Proportion of elderly patients (older than 70 years of age) operated on in different European countries

Unit	Percent
Bm02dl	28.76
Bm05dl	33.77
Bm19dl°	29.17
Ch10dl	29.62
Fr130780521	36.24
Fr130785652°	40.87
Fr140000209	31.78
Fr170000087°	42.01
Fr210987558	36.65
Fr290000215°	31.77
Fr300782117°	48.28
Fr310019351	30.45
Fr330783648	29.77
Fr340796663	37.88
Fr350000741	35.21
Fr370004467	37.39
Fr380000067	41.17
Fr380786442°	43.92
Fr540000486	36.41
Fr540001138°	30.17
Fr560002511	35.6
Fr570001057°	31.78
Fr590000618	27.82
Fr590780268	29.43
Fr590780383	27.8
Fr590784864	28.72
Fr620100750	29.77
Fr630000479	35.5
Fr660780784	37.06
Fr670000025	34.25
Fr690000880	31.96
Fr690784186	36.49
Fr750100232°	34.76
Fr750100273	32.85
Fr750150104	35.96
Fr750712184	40.17
Fr750803447	36.23
Fr760000158	29.69
Fr800006124	31.44

Unit	Percent
Fr830100574	46.7
Fr840001861	38.36
Fr860000223	34.41
Fr870000064°	35.84
Fr920000650	37.63
Fr920000684	30.58
Fr920300043°	43.18
Fr930100037°	35.46
Gr02d0	41.25
Gy18dl	38.04
Gy23dl	28.39
Hu01dl	20.94
Hu02dl	23.78
Hu03dl	23.01
Hu04dl	21.28
Hu05dl	18.1
Hu06dl	19.68
Hu07dl	24.28
Hu08dl	21.77
Hu09dl	21.78
Hu12dl	16.52
Ie01dl	40.59
It03d0	37.83
It26dl	46
It32dl	37.72
It38dl	46.81
It44dl	41.62
It48dl°	55.84
ITSICT-0078	47.99
ITSICT-0086°	36.86
ITSICT-0097°	55.13
NI19dl°	37.58
PI06dl°	36.99
Sk01dl°	20.48
Sp01dl	36.41
Sp07d0	37.79
Sp17dl	36.58
Sp28dl°	30.19
Sp31dl°	38.35
Ty09d0°	16.17
Uk05dl	50.44

(°): Units with less than 500 patients included, results must be interpreted with caution

Percentage of patients submitted to major anatomic lung resections with preoperative measurement of DLCO in different European Countries.

Unit	Percent
Bm02dl	90.29
Bm05dl	92.11
Bm19dl°	90.71
Ch10dl	83.3
Fr130780521	96.86
Fr130785652°	51.22
Fr140000209	92.44
Fr170000087°	58.39
Fr210987558	67.92
Fr290000215°	70.47
Fr300782117°	91.76
Fr310019351	64.1
Fr330783648	60.78
Fr340796663°	77.54
Fr350000741°	70.62
Fr370004467°	86.33
Fr380000067°	56.09
Fr380786442°	72.54
Fr540000486°	27.88
Fr540001138	82.68
Fr560002511°	51.01
Fr570001057°	44.83
Fr590000618°	14.04
Fr590780268°	47.57
Fr590780383°	56.95
Fr590784864°	87.25
Fr620100750°	55.56
Fr630000479	92.83
Fr660780784°	17.44
Fr670000025	46.19
Fr690000880°	98.37
Fr690784186°	82.48
Fr750100232°	74.26
Fr750100273	84.87
Fr750150104	73.92
Fr750712184	68.09
Fr750803447	46.2
Fr760000158	74.28
Fr800006124°	85.19
Fr830100574°	95.41
Fr840001861°	89.47
Fr860000223	79.58
Fr870000064°	76.44

Unit	Percent
Fr920000650	90.16
Fr920000684	79.46
Fr920300043°	18.92
Fr930100037°	48.63
Gr02d0°	5.88
Gy18dl°	61.59
Gy23dl	89.82
Hu01dl	12.4
Hu02dl	38.21
Hu03dl	1.09
Hu04dl°	0.24
Hu05dl°	0.42
Hu06dl	1.69
Hu07dl°	1.45
Hu08dl	0.1
Hu09dl	0.27
Hu12dl	54.45
Ie01dl°	98.95
It03d0	73.52
It26dl°	85.02
It32dl	94.01
It38dl°	52.88
It44dl	50.55
It48dl°	98.05
ITSICT-0078°	92.96
ITSICT-0086°	100
ITSICT-0097°	100
NI19dl°	95.41
PI06dl	82.06
Sk01dl	90.59
Sp01dl	89.87
Sp07d0	72.84
Sp17dl	81.74
Sp28dl	87.44
Sp31dl°	89.03
Ty09d0°	44.91
Uk05dl	93.57

(°): Units with less than 500 patients included, results must be interpreted with caution

Percentage of patients with primary neoplastic disease and suspicious clinical N2 stage (enlarged >1cm mediastinal nodes at CT scan or PET positive mediastinal nodes) who underwent at least one preoperative invasive mediastinal staging procedure (EBUS, EUS, mediastinoscopy, mediastinotomy, VATS, TEMPLA etc.)

Unit	Percent
Bm02dl°	86.08
Bm05dl°	89.49
Bm19dl°	74.55
Ch10dl°	83.8
Fr130780521°	80.15
Fr130785652°	100
Fr140000209°	67.57
Fr170000087°	1.36
Fr210987558°	34.19
Fr290000215°	12.2
Fr300782117°	50
Fr310019351	59.2
Fr330783648	30.58
Fr340796663°	46.67
Fr350000741°	53.85
Fr370004467°	36.96
Fr380000067°	32
Fr380786442°	47.22
Fr540000486°	10.67
Fr540001138°	40.38
Fr560002511°	50
Fr570001057°	19.23
Fr590000618°	25
Fr590780268°	50
Fr590780383°	15.15
Fr590784864°	43.64
Fr620100750°	75
Fr630000479°	48.21
Fr660780784°	30.77
Fr670000025	24.93
Fr690000880°	65.71
Fr690784186°	27.45
Fr750100232°	91.67
Fr750100273°	35.25
Fr750150104°	67.19
Fr750712184°	31.94
Fr750803447°	13.21
Fr760000158°	36.59
Fr800006124°	65.96
Fr830100574°	82.69
Fr840001861°	36.96

Unit	Percent
Fr860000223°	15.58
Fr870000064°	20
Fr920000650°	27.78
Fr920000684°	35.21
Fr920300043°	58.33
Fr930100037°	54.84
Gr02d0°	2.56
Gy18dl°	51.95
Gy23dl°	61.15
Hu01dl°	7.87
Hu02dl°	8.6
Hu03dl	6.96
Hu04dl°	8
Hu05dl°	3.77
Hu06dl°	4.09
Hu07dl°	24
Hu08dl°	32.26
Hu09dl°	12.5
Hu12dl°	75.57
Ie01dl°	61.84
It03d0°	33.33
It26dl°	40
It32dl°	8.33
It38dl°	14.29
It44dl°	49.33
It48dl°	76.47
ITSICT-0078°	75.58
ITSICT-0086°	81.82
ITSICT-0097°	92.86
NI19dl°	85
PI06dl°	76.09
Sk01dl°	34.29
Sp01dl°	76.24
Sp07d0°	42.77
Sp17dl°	75.68
Sp28dl°	70.27
Sp31dl°	64.44
Ty09d0°	84.88
Uk05dl°	85.14

(°): Units with less than 500 patients included, results must be interpreted with caution

Percentage of patients submitted to lymph node dissection during major lung resection for malignant primary neoplastic disease grouped by Countries

Lymph node dissection more extended than sampling alone or selected biopsy (as defined and recommended by the ESTS guidelines for intra-operative mediastinal staging) in lung cancer patients was a frequent procedure in all countries.

This variable will be included in the composite performance score (CPS) used for the ESTS quality certification program.

Unit	Percent
Bm02dl	91.68
Bm05dl	95.1
Bm19dl°	99.42
Ch10dl	97.11
Fr130780521	95.95
Fr130785652°	98.63
Fr140000209	94.7
Fr170000087°	94.97
Fr210987558	99.3
Fr290000215°	98.32
Fr300782117°	98.21
Fr310019351	98.16
Fr330783648	98.51
Fr340796663°	91.97
Fr350000741°	82.07
Fr370004467°	91.71
Fr380000067°	71.72
Fr380786442°	93.64
Fr540000486	98.08
Fr540001138	99.61
Fr560002511°	97.68
Fr570001057°	96.51
Fr590000618°	76.92
Fr590780268°	99.25
Fr590780383°	99.54
Fr590784864°	86.89
Fr620100750°	100
Fr630000479	97.19
Fr660780784°	97.47
Fr670000025	96.83
Fr690000880°	96.05
Fr690784186°	99.76
Fr750100232°	95.12
Fr750100273	98.89
Fr750150104	93.27
Fr750712184	94.62
Fr750803447	97.79

Unit	Percent
Fr760000158	80.61
Fr800006124°	99.12
Fr830100574°	91.85
Fr840001861°	99.72
Fr860000223	97.43
Fr870000064°	88.94
Fr920000650	86.44
Fr920000684	94.53
Fr920300043°	99.23
Fr930100037°	99.39
Gr02d0°	82.98
Gy18dl°	100
Gy23dl	96.85
Hu01dl	95.36
Hu02dl	90.05
Hu03dl	56.95
Hu04dl°	97.9
Hu05dl°	61.39
Hu06dl°	95.99
Hu07dl°	99.09
Hu08dl°	50.57
Hu09dl	91.81
Hu12dl	97.36
Ie01dl°	90.59
It03d0	94.26
It26dl°	52.43
It32dl	87.76
It38dl°	97.26
It44dl	96.11
It48dl°	79.58
ITSICT-0078°	89.37
ITSICT-0086°	70.69
ITSICT-0097°	0.83
NI19dl°	91.69
PI06dl	99.59
Sk01dl	60.14
Sp01dl	92.01

Unit	Percent
Sp07d0	92.93
Sp17dl	96.84
Sp28dl	14.51
Sp31dl°	91.35
Ty09d0°	87
Uk05dl	80.99

(°): Units with less than 500 patients included, results must be interpreted with caution

Primary lung cancer per contributing Units

Percentage of lung excision procedures

Unit	Bilobectomy	Lobectomy	Lung Volume Reduction	Pneum.	Segmentectomy	Wedge	Unk
Bm02dl	3.9	62.6	0	11.5	6.1	15.9	0
Bm05dl	6.6	71	0	10.8	6.2	5.4	0
Bm19dl°	5.3	88.2	0	3.5	0	3	0
Ch10dl	3.2	74.1	0.2	9.7	6.7	4.6	1.5
Fr130780521	2.2	66.3	0	4.5	16.9	8.6	1.5
Fr130785652°	2.6	64.8	0	3.9	22.2	5.2	1.3
Fr140000209	4.3	75.9	0	3.9	3.2	11.3	1.4
Fr170000087°	1.8	84.9	0	8.6	1.2	1.2	2.3
Fr210987558	3.3	70.2	0	5.9	17.5	2.1	1
Fr290000215°	5	72.1	0	5.2	3.6	13.5	0.6
Fr300782117°	3.9	76.1	0	2.9	14.6	2	0.5
Fr310019351	2.9	82.4	0.1	5.4	4.7	2.3	2.2
Fr330783648	3.1	77.5	0	2.5	12.8	3.1	1
Fr340796663	4.2	70.9	0	3.2	16.4	5.1	0.2
Fr350000741	2.2	62.2	0	2.9	9.6	21.6	1.5
Fr370004467	3.6	69.7	0	3	7.5	14.8	1.4
Fr380000067	3.3	69	0	3.7	17.7	4.8	1.5
Fr380786442°	2.1	70.9	0	2.1	22.5	1.9	0.5
Fr540000486	2.9	76.3	0	9.1	3.8	6.7	1.2
Fr540001138	1.8	69.3	0	6.3	15.5	5.4	1.7
Fr560002511°	7.1	81.8	0	5.4	1.1	4.6	0
Fr570001057	2	69.8	0	3.9	6.7	15.7	1.9
Fr590000618°	1.8	84.2	0	3.3	1.2	9.3	0.2
Fr590780268°	6	85.5	0	2.8	2.1	3.6	0
Fr590780383	4.6	76.8	0	6.4	6	5.8	0.4
Fr590784864	3	69.9	0.2	3.9	13.7	8.1	1.2
Fr620100750°	2.9	62.8	0	4.2	9.7	19.4	1
Fr630000479	2.9	73.6	0	5.2	9.7	7.2	1.4
Fr660780784°	3.5	91.6	0	3.1	1.1	0.7	0
Fr670000025	2.8	72.1	0	7.7	11.3	4.5	1.6
Fr690000880	5.1	73.7	0	5.5	10.6	3.7	1.4
Fr690784186	2.9	75.7	0	3.8	12.7	3.9	1
Fr750100232°	2.4	77.6	0	2.4	15.8	1.8	0
Fr750100273	2.6	66.4	0.1	6.3	20.5	2.9	1.2
Fr750150104	2.4	61.8	0.1	2.7	29	2.9	1.1
Fr750712184	2.5	53.1	0.1	6.2	28.4	8.6	1.1
Fr750803447	4.8	73.5	0	4.5	7.2	9.2	0.8
Fr760000158	2.2	61.3	0	6.3	19	10.8	0.4
Fr800006124	2.1	73.4	0	5.9	8.5	9.6	0.5
Fr830100574	2.9	67.4	0	3.6	6.9	18.5	0.7
Fr840001861	1.2	58.3	0	2.2	23.9	11	3.4

Unit	Lung Volume						Unk
	Bilobectomy	Lobectomy	Reduction	Pneumonectomy	Segmentectomy	Wedge	
Fr860000223	3.8	72.5	0	5.5	8.9	7.7	1.6
Fr870000064°	2.9	68.4	0	3.2	14	9	2.5
Fr920000650	2.7	72	0	2.4	16.1	5.4	1.4
Fr920000684	3.8	76.2	0	4.9	7	7.1	1
Fr920300043°	3.3	67.5	0	1.1	25.6	2.2	0.3
Fr930100037°	5.1	75.8	0.3	2.8	7.1	7.9	1
Gr02d0°	4.9	60.4	0	16	4.5	4.7	9.5
Gy18dl°	5.4	61.3	0	8.2	21.5	3.6	0
Gy23dl	3.3	69.4	0.1	5.6	5.3	16.3	0
Hu01dl	3	60	0	4.9	9.1	23	0
Hu02dl	2.9	74.2	0	5	7.2	10.5	0.2
Hu03dl	2.5	66.6	0	8.4	4.3	17.1	1.1
Hu04dl°	2.9	70.4	1.1	4.2	12.3	7.1	2
Hu05dl°	0.7	73.5	0	8.1	12.3	4.2	1.2
Hu06dl	1.3	69.5	0	5.4	1.3	22.3	0.2
Hu07dl	1.1	74.1	0	2.2	1.4	21.2	0
Hu08dl	2.3	51.6	0	13	11.1	21.2	0.8
Hu09dl	3.1	71.2	0	9.2	3.3	12.5	0.7
Hu12dl	2.1	69.8	0	6.6	7.1	14.3	0.1
Ie01dl°	4.9	85	0	5.6	0.2	4.1	0.2
It03d0	3.5	75.1	0	4.9	7.2	9.2	0.1
It26dl°	1.6	56.6	0	4.4	4.6	30.9	1.9
It32dl	3.3	74.4	0	6.6	5.8	9.7	0.2
It38dl°	5.2	86.1	0	1.7	1.5	5.5	0
It44dl	4.4	73.6	0	6.8	8.9	6.3	0
It48dl°	4	88.9	0	0.4	6.7	0	0
ITSICT-0078°	2.6	81.4	0	0	16	0	0
ITSICT-0086°	2	93.8	0	0	4.2	0	0
ITSICT-0097°	1.6	77.6	0	0	20.8	0	0
NI19dl°	3.4	66.2	0	4.7	10.5	14.9	0.3
PI06dl	3.6	83.1	0	3.7	7.3	2.3	0
Sk01dl	4.7	86.8	0	6.8	1.7	0	0
Sp01dl	4.6	81.8	0	5.8	6.5	1.2	0.1
Sp07d0	3.2	58.6	0	3.8	9.3	24.9	0.2
Sp17dl	3.8	74	0	6	8.7	7.4	0.1
Sp28dl	3.6	73.7	0	6.5	14.6	1.6	0
Sp31dl°	2.5	68.4	0	4.4	11.8	12.3	0.6
Ty09d0°	6	75.9	0	10.8	1.3	6	0
Uk05dl	3.3	80.6	0	6.8	7.7	1	0.6

(°): Units with less than 500 patients included, results must be interpreted with caution

Proportion and type of estended resections amongst lobectomy and bilobectomy

Unit	Alone	Superior			Diaphragm Resection	Atrial Resection	SVC		Unk
		Chest Wall	Sulcus Tumor	Sleeve			Resection Recon.	Vertebral Resection	
Bm02dl°	90.6	1.7	1.3	5.4	0.3	0.3	0	0	0.4
Bm05dl	79.7	3.7	1.7	14.2	0.2	0.2	0.1	0.1	0.1
Bm19dl°	94.3	4.4	0	1.3	0	0	0	0	0
Ch10dl	54.9	7.8	0.2	13.4	0.5	1.6	0.1	0	21.5
Fr130780521	89.6	5.9	0.9	3.6	0	0	0	0	0
Fr130785652°	91	7.1	0	1.9	0	0	0	0	0
Fr140000209	93.3	5.9	0	0.8	0	0	0	0	0
Fr170000087°	99.3	0.4	0	0	0	0	0.3	0	0
Fr210987558	91	6.4	0	2.3	0.2	0	0.1	0	0
Fr290000215°	86	11.5	0	2.5	0	0	0	0	0
Fr300782117°	90.8	4.3	0.6	4.3	0	0	0	0	0
Fr310019351	91.4	6.7	0.2	1.6	0.1	0	0	0	0
Fr330783648	91.4	5.2	0.4	3	0	0	0	0	0
Fr340796663°	94.2	2.5	0.3	3	0	0	0	0	0
Fr350000741°	92.7	5.1	0.5	1.7	0	0	0	0	0
Fr370004467°	94.3	5	0	0.7	0	0	0	0	0
Fr380000067°	87.5	9.6	0	2.9	0	0	0	0	0
Fr380786442°	80.4	17	0.4	2.2	0	0	0	0	0
Fr540000486	97.1	1.8	0	1.1	0	0	0	0	0
Fr540001138°	91.3	5.7	0.9	1.9	0.2	0	0	0	0
Fr560002511°	86.2	11.3	0	2.5	0	0	0	0	0
Fr570001057°	95.3	4.4	0	0.3	0	0	0	0	0
Fr590000618°	94.7	4.4	0.3	0.6	0	0	0	0	0
Fr590780268°	85.7	13.9	0	0.4	0	0	0	0	0
Fr590780383°	86.2	12.5	0.3	1	0	0	0	0	0
Fr590784864°	92.6	3.5	0.9	3	0	0	0	0	0
Fr620100750°	92.6	5.4	0	2	0	0	0	0	0
Fr630000479	94	2.7	0.3	2.7	0.3	0	0	0	0
Fr660780784°	82.7	16.9	0	0.4	0	0	0	0	0
Fr670000025	87.9	8	0.4	3.7	0	0	0	0	0
Fr690000880°	88.5	3.5	1	7	0	0	0	0	0
Fr690784186°	88	8.8	1.2	2	0	0	0	0	0
Fr750100232°	97	2.3	0	0.7	0	0	0	0	0
Fr750100273	95.6	2.6	0.4	1.4	0	0	0	0	0
Fr750150104	95.2	3.3	0.4	1.1	0	0	0	0	0
Fr750712184	93	3.9	0.3	2.6	0.2	0	0	0	0
Fr750803447	89.2	8.7	0.6	1.5	0	0	0	0	0
Fr760000158	90	8.4	0	1.6	0	0	0	0	0
Fr800006124°	80.5	17.6	0.7	1.2	0	0	0	0	0
Fr830100574°	91.6	4.8	0	3.6	0	0	0	0	0
Fr840001861°	94.8	4.6	0	0.6	0	0	0	0	0
Fr860000223	94	3.2	0.8	2	0	0	0	0	0

Unit	Alone	Superior			Diaphragm Resection	Atrial Resection	SVC Resection Reconstruct ion	Vertebral Resection	Unk
		Chest Wall	Sulcus Tumor	Sleeve					
Fr870000064°	97.5	2	0	0.5	0	0	0	0	0
Fr920000650	91.1	2.4	0.4	6.1	0	0	0	0	0
Fr920000684	88.3	4.9	1.4	5.4	0	0	0	0	0
Fr920300043°	84.3	15.7	0	0	0	0	0	0	0
Fr930100037°	87.1	8.8	0	4.1	0	0	0	0	0
Gr02d0°	92.5	3.1	1.6	1.9	0	0.6	0	0	0.3
Gy18dl°	78.7	6.8	0.9	12.2	0	0.9	0.5	0	0
Gy23dl	84.1	3.5	1.4	10	0.3	0.2	0.4	0.1	0
Hu01dl	81.1	2.3	0	2.2	0	0.2	0	0	14.2
Hu02dl	20.5	1.4	0.1	7.6	0.2	0	0.2	0.2	69.8
Hu03dl	38.1	6.2	0.1	6	0.5	0.1	0.1	0	48.9
Hu04dl°	26	3.9	0.6	1.2	0.6	0	0.6	0	67.1
Hu05dl°	0.6	0	4.4	0	0	0	0	0	95
Hu06dl°	96.9	0	0	0.2	0.2	0	0	0	2.7
Hu07dl°	97.8	0	0	1.9	0	0.3	0	0	0
Hu08dl	38	1	0.1	0.2	0.3	0.1	0	0.2	60.1
Hu09dl	43.9	1.2	0.1	1.1	0.3	0.1	0.3	0	53
Hu12dl	89.1	1.5	0	0.9	0.1	0	0	0	8.4
Ie01dl°	91.7	1.4	0.2	6.2	0	0.5	0	0	0
It03d0	94	1.4	0.1	3.8	0.1	0.2	0	0	0.4
It26dl°	96.8	2.4	0	0	0	0	0	0	0.8
It32dl	87.8	2.5	0.3	1.1	0	0.1	0.1	0.1	8
It38dl°	98.4	1.3	0	0.3	0	0	0	0	0
It44dl	95.8	2.1	0	1.1	0.5	0	0.3	0.2	0
It48dl°	98.3	1.7	0	0	0	0	0	0	0
ITSICT-0078°	95.7	0.7	0	3.6	0	0	0	0	0
ITSICT-0086°	99.2	0.8	0	0	0	0	0	0	0
ITSICT-0097°	98.3	0.9	0	0.8	0	0	0	0	0
NI19dl°	89.1	4.1	1.5	3.4	1.1	0.4	0.4	0	0
PI06dl	99.5	0.1	0	0.3	0	0	0	0	0.1
Sk01dl	94.6	1.3	0.3	3.6	0.2	0	0	0	0
Sp01dl	79	4.9	0.8	3.7	0.1	0.2	0	0	11.3
Sp07d0	93	2.8	0.5	0.3	0.3	0	0	0.1	3
Sp17dl	86	3.4	1.9	6.9	0.2	0.7	0.2	0.5	0.2
Sp28dl	95.7	1.9	0.5	1.5	0.4	0	0	0	0
Sp31dl°	91.8	3.5	0.6	3.2	0	0.3	0	0.3	0.3
Ty09d0°	89.6	5.5	0	2.5	0.9	0	0	0	1.5
Uk05dl	95.9	1.8	0.2	1.7	0.4	0	0	0	0

(°): Units with less than 500 patients included, results must be interpreted with caution

Proportion of estended and type of resection amongts pneumonectomies

Unit	Alone	Comp.	Intrap.	Pleuropne um.	Sleeve Resec tion	Diaphragm Resection	Atrial Resectio n	SVC Resection/ Recon.	Vertebral Resection	Unkn
Bm02dl	32.1	18.3	32.8	1.5	2.3	0	0	0	0.8	12.2
Bm05dl	59.3	6	28.8	0.4	0.4	0	0	0.4	0.9	3.8
Bm19dl°	100	0	0	0	0	0	0	0	0	0
Ch10dl	22.8	4.8	22.9	20	4.8	7.6	2.9	0.9	0	13.3
Fr130780521	50.6	1.3	0	0	1.3	0	0	0	0	46.8
Fr130785652°	88.9	11.1	0	0	0	0	0	0	0	0
Fr140000209	29.3	2.4	0	0	0	0	0	0	0	68.3
Fr170000087°	44.8	3.5	0	0	0	0	0	0	0	51.7
Fr210987558	54.1	0	0	0	3.5	0	0	0	0	42.4
Fr290000215°	31.6	0	0	0	0	0	0	0	0	68.4
Fr300782117°	66.7	0	0	0	0	0	0	0	0	33.3
Fr310019351	51.5	0	0	0	0	0	0	0	0	48.5
Fr330783648	51.4	2.9	0	0	0	0	0	0	0	45.7
Fr340796663	58.8	0	0	0	0	0	0	0	0	41.2
Fr350000741	81.3	0	0	0	0	0	0	0	0	18.7
Fr370004467	70.6	0	0	0	0	0	0	0	0	29.4
Fr380000067	68.4	0	0	0	0	0	0	0	0	31.6
Fr380786442°	37.5	0	0	0	0	0	0	0	0	62.5
Fr540000486	50.7	0	0	0	1.3	0	0	0	0	48
Fr540001138	54.8	0	0	0	0	0	0	0	0	45.2
Fr560002511°	45	0	0	0	0	0	0	0	0	55
Fr570001057	47.6	0	0	0	0	0	0	0	0	52.4
Fr590000618°	69.2	0	0	0	0	0	0	0	0	30.8
Fr590780268°	37.5	0	0	0	0	0	0	0	0	62.5
Fr590780383	46.9	0	0	0	0	0	0	0	0	53.1
Fr590784864	78.3	4.3	0	0	13	0	0	0	0	4.4
Fr620100750°	30.8	0	0	0	0	0	0	0	0	69.2
Fr630000479	63.4	7.3	0	0	4.9	0	0	0	0	24.4
Fr660780784°	55.6	0	0	0	0	0	0	0	0	44.4
Fr670000025	46.2	0	0	0	1	0	0	0	0	52.8
Fr690000880	42.9	0	0	0	0	0	0	0	0	57.1
Fr690784186	40	0	0	0	0	0	0	0	0	60
Fr750100232°	100	0	0	0	0	0	0	0	0	0
Fr750100273	50.8	0	0	0	0	0	0	0	0	49.2
Fr750150104	57.9	0	0	0	0	0	0	0	0	42.1
Fr750712184	51.5	3	0	0	0	0	0	0	0	45.5
Fr750803447	39.5	0	0	0	0	0	0	0	0	60.5
Fr760000158	56.4	0	0	0	1.3	0	0	0	0	42.3
Fr800006124	42.4	3.1	0	0	3	0	0	0	0	51.5
Fr830100574	50	0	0	0	0	0	0	0	0	50
Fr840001861	61.5	0	0	0	0	0	0	0	0	38.5
Fr860000223	56.8	0	0	0	0	0	0	0	0	43.2

Unit	Alone	Comp.	Intrap.	Pleuropneum.	Sleeve Resection	Diaphragm Resection	Atrial Resection	SVC Resection/Reconstruction	Vertebral Resection	Unkn
Fr870000064°	55.6	0	0	0	0	0	0	0	0	44.4
Fr920000650	45.8	0	0	0	4.2	0	0	0	0	50
Fr920000684	43.6	2.6	0	0	5.1	0	0	0	0	48.7
Fr920300043°	25	0	0	0	0	0	0	0	0	75
Fr930100037°	45.5	0	0	0	0	0	0	0	0	54.5
Gr02d0°	21.5	13.9	34.2	3.8	1.3	0	1.3	1.2	0	22.8
Gy18dl°	22.2	0	59.3	14.8	0	0	3.7	0	0	0
Gy23dl	38.8	1.6	36.4	6.6	8.3	1.6	5	1.7	0	0
Hu01dl	73.9	4.4	13	2.2	0	0	0	0	0	6.5
Hu02dl	14.3	18.7	2.2	0	0	0	0	1.1	0	63.7
Hu03dl	33.5	26.6	10.8	2.5	1.6	0.3	0	0	0	24.7
Hu04dl°	26.3	47.4	5.3	0	0	5.2	0	0	0	15.8
Hu05dl°	8.6	31.4	2.9	0	0	0	0	0	0	57.1
Hu06dl	36.1	0	16.7	0	0	0	0	0	0	47.2
Hu07dl	66.7	0	33.3	0	0	0	0	0	0	0
Hu08dl	28.4	12.4	7.1	0	0	0	0	0	0	52.1
Hu09dl	39.1	13.1	21.7	1.1	0	0	2.2	0	0	22.8
Hu12dl	83.5	4.3	7.9	0	0	0	0	0	0	4.3
Ie01dl°	69.2	0	26.9	0	0	3.9	0	0	0	0
It03d0	46.4	8.7	23.2	0	4.3	0	1.5	0	0	15.9
It26dl°	73.7	5.3	10.5	0	0	0	0	0	0	10.5
It32dl	64.3	4.3	27.2	0	1.4	0	1.4	0	0	1.4
It38dl	0	0	16.7	0	0	0	0	0	0	83.3
It44dl	75.9	3.7	13	1.9	0	0	3.7	1.8	0	0
It48dl	0	0	0	0	0	0	0	100	0	0
NI19dl°	77.8	0	22.2	0	0	0	0	0	0	0
PI06dl	71.8	0	25.6	0	2.6	0	0	0	0	0
Sk01dl	75.6	0	24.4	0	0	0	0	0	0	0
Sp01dl	50	9.5	12.2	6.8	2.7	1.3	1.3	0	0	16.2
Sp07d0	48.7	10.2	17.9	2.6	2.6	0	2.6	2.6	0	12.8
Sp17dl	91.1	6.7	0	0	2.2	0	0	0	0	0
Sp28dl	73.3	11.1	6.7	0	0	0	0	0	0	8.9
Sp31dl°	42.8	9.5	38.1	4.8	0	0	0	0	0	4.8
Ty09d0°	76.7	7	4.7	0	0	0	0	0	0	11.6
Uk05dl	30.4	4.3	4.4	0	1.1	0	0	0	0	59.8

(°): Units with less than 500 patients included, results must be interpreted with caution

Percentage of VATS (LOBECTOMIES)

Unit	No	Yes	Unknown
Bm02dl	86.7	13.3	0
Bm05dl	47.1	52.9	0
Bm19dl°	72.5	27.5	0
Ch10dl	46.8	38.7	14.5
Fr130780521	45.7	53.5	0.8
Fr130785652°	22.8	77.2	0
Fr140000209	74.2	25.8	0
Fr170000087°	73.9	26.1	0
Fr210987558	67.8	16.2	16
Fr290000215°	47.9	52.1	0
Fr300782117°	21.8	77.6	0.6
Fr310019351	58.6	41.1	0.3
Fr330783648	46.1	53.4	0.5
Fr340796663°	23.2	76.3	0.5
Fr350000741°	18.4	80.2	1.4
Fr370004467°	71.1	28.9	0
Fr380000067°	65.4	34.1	0.5
Fr380786442°	53	47	0
Fr540000486°	82.8	17.2	0
Fr540001138	61.1	38.5	0.4
Fr560002511°	41.2	58.8	0
Fr570001057	52.1	47.9	0
Fr590000618°	80.7	19.3	0
Fr590780268°	29.3	70.3	0.4
Fr590780383°	84.4	15.6	0
Fr590784864°	60.9	33.3	5.8
Fr620100750°	100	0	0
Fr630000479	42.6	56.7	0.7
Fr660780784°	66	34	0
Fr670000025	45	54.3	0.7
Fr690000880°	33.5	65.7	0.8
Fr690784186°	45.3	54.2	0.5
Fr750100232°	31.2	67.2	1.6
Fr750100273	58	38.1	3.9
Fr750150104	25.6	73.4	1
Fr750712184	78.9	19.3	1.8
Fr750803447	72.9	25.8	1.3
Fr760000158	22.3	76.5	1.2
Fr800006124°	21	78.8	0.2
Fr830100574°	42.3	56.9	0.8
Fr840001861°	80.9	19.1	0
Fr860000223	70.6	29.2	0.2
Fr870000064°	48.7	51.3	0
Fr920000650	37.3	56.8	5.9

Unit	No	Yes	Unknown
Fr920000684	27.5	70	2.5
Fr920300043	42.4	57.2	0.4
Fr930100037°	71.8	27.5	0.7
Gr02d0°	99.3	0.7	0
Gy18dl°	96.6	3.4	0
Gy23dl	62.8	37.2	0
Hu01dl	44.9	55.1	0
Hu02dl	50.8	49	0.2
Hu03dl	39.9	60	0.1
Hu04dl°	47	49.9	3.1
Hu05dl°	39.1	60.9	0
Hu06dl	83.9	16.1	0
Hu07dl°	20.9	79.1	0
Hu08dl	75.9	24.1	0
Hu09dl	64.3	35.7	0
Hu12dl	59.1	40.4	0.5
Ie01dl°	36.4	63.6	0
It03d0	55.9	43.4	0.7
It26dl°	66.5	33.5	0
It32dl	70.4	29.6	0
It38dl°	35.1	64.9	0
It44dl	69	31	0
It48dl°	18.8	81.2	0
ITSICT-0078°	6	94	0
ITSICT-0086°	4.5	95.5	0
ITSICT-0097°	2.1	97.9	0
NI19dl°	9.9	90.1	0
PI06dl	57	43	0
Sk01dl	52.7	47.3	0
Sp01dl	62.5	37.5	0
Sp07d0	94.2	5.8	0
Sp17dl	66.9	33.1	0
Sp28dl	24.6	75.4	0
Sp31dl°	13.1	86.9	0
Ty09d0°	50.5	49.5	0
Uk05dl	27.1	72.7	0.2

(°): Units with less than 500 patients included, results must be interpreted with caution

Observed versus predicted in-hospital mortality rates of major lung resections in different European Units

(risk adjustment according to Brunelli A et al. please see Appendix for details of applied risk models EUROLUNG2)

Predicted and Observed In-Hospital Mortality Rate (%)	N	Observed	Predicted
Bm02dl	818	1.83	2.84
Bm05dl	1759	1.59	2.16
Bm19dl°	161	2.48	1.38
Ch10dl	629	1.27	2.03
Fr130780521	1113	2.07	1.72
Fr130785652°	94	2.13	1.65
Fr140000209	872	1.15	2.07
Fr170000087°	243	2.88	2.45
Fr210987558	676	1.33	2.5
Fr290000215°	258	1.16	1.88
Fr300782117°	117	1.71	1.7
Fr310019351	941	0.43	1.78
Fr330783648	829	2.17	1.59
Fr340796663°	186	0.54	1.45
Fr350000741°	274	0.73	1.25
Fr370004467°	345	2.03	1.94
Fr380000067°	282	0.71	2.29
Fr380786442°	253	1.98	2
Fr540000486	642	1.09	2.66
Fr540001138°	416	1.2	2.36
Fr560002511°	201	0	1.66
Fr570001057°	254	0.39	1.54
Fr590000618°	277	0.36	2.28
Fr590780268°	219	0	1.37
Fr590780383°	419	0.24	2.44
Fr590784864°	236	0	1.78
Fr620100750°	174	0.57	2.85
Fr630000479	503	0.8	1.78
Fr660780784°	214	0	2.1
Fr670000025	941	1.17	1.96
Fr690000880°	399	0.25	1.64
Fr690784186°	375	0.53	1.82
Fr750100232°	80	0	1.55
Fr750100273°	192	0	1.78
Fr750150104	569	1.05	1.49
Fr750712184	579	0.52	2.49
Fr750803447	515	0	2.07
Fr760000158	671	0.15	1.48

Predicted and Observed In-Hospital Mortality Rate (%)	N	Observed	Predicted
Fr800006124°	393	1.02	1.78
Fr830100574°	317	2.84	2.07
Fr840001861°	302	1.32	2.06
Fr860000223	630	1.9	2.3
Fr870000064°	158	0.63	1.73
Fr920000650°	486	0.82	1.52
Fr920000684°	193	0.52	1.53
Fr920300043°	245	1.22	1.08
Fr930100037°	227	1.76	2.1
Gr02d0°	303	1.98	3.56
Gy18dl°	239	6.28	2.95
Gy23dl	1628	1.78	2.17
Hu01dl°	481	1.66	1.43
Hu02dl	850	0.35	1.5
Hu03dl	2719	0.88	1.66
Hu04dl°	159	1.89	1.48
Hu05dl°	240	0.42	1.61
Hu06dl°	428	0.47	1.75
Hu07dl°	399	2.51	1.19
Hu08dl°	61	1.64	3.21
Hu09dl°	198	0	1.67
Hu12dl	1609	1.06	1.78
Ie01dl°	426	3.52	1.81
It03d0	950	0.53	2.07
It26dl°	255	0	2.71
It32dl	852	0.12	2.45
It38dl°	311	0.96	1.89
It44dl	673	0.74	1.88
It48dl°	233	0	1.31
ITSICT-0078°	383	0	0.94
ITSICT-0086°	389	0.77	0.85
ITSICT-0097°	240	0	0.93
NI19dl°	282	2.84	1.48
PI06dl	932	0.54	1.81
Sk01dl	627	0.8	1.69
Sp01dl	762	0.52	2.33
Sp07d0°	482	0.83	2.47
Sp17dl	586	1.71	2.53
Sp28dl	544	1.65	1.75
Sp31dl°	339	1.77	1.53
Ty09d0°	358	2.79	2.11
Uk05dl	1124	2.94	1.66

(°): Units with less than 500 patients included, results must be interpreted with caution

PART 3

THYMOMA SECTION (Database users only)

Message from Clinical Leader of ESTS Registry Thymoma section

Dr. Bernhard Moser

Chair ESTS Thymic Working Group

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The ESTS Thymic epithelial tumor database is still growing through meticulous data input from experts in thymic epithelial tumor treatment on several continents.

As with the previous editions, the thymic epithelial tumor section of the 2022 ESTS Silver Book includes the data of the ESTS prospective thymic database as of December 2021, coordinated by the ESTS database committee and managed by the official platform of the ESTS Registry (KData Clinical srl). The continued support of currently 98 centers around the globe (83 from Europe, 9 from Brazil, 2 from Asia, 2 from Africa, 1 from Canada, 1 from Belarus) has increased the number of registered cases from 2698 to 3181. The trend of minimally-invasive surgery continues: in the meanwhile, VATS and RATS already make up 47.7% of all reported surgical approaches compared to 43.9% in 2021 and 35% in the 2019 Silverbook. Adding to the ongoing scientific discussion on the extent of thymectomy that has to be performed, centers reporting to our register are obviously in favor of total thymectomy (92% of the reported cases).

The database complies with the standards of the 2021 WHO Classification of Tumors of the Thymus and Mediastinum as our contributing centers report what has become obligatory - the IASLC/ITMIG TNM stage classification of thymic tumors (8th edition) – in parallel to modified Masaoka-Koga stage (ICCR recommended in order to still enable working with Masaoka-Koga based treatment recommendation, e.g. ESMO clinical practice guidelines 2015). The percent data completeness for pathologic TNM is 76,4% and 76.5% for modified Masaoka-Koga stage, respectively.

As one of these last year`s highlights of ESTS Thymic Database activities I want to direct your attention to the project “Surgical resection of Masaoka stage III thymic epithelial tumours with great vessels involvement: a retrospective multicentric analysis from the European Society of Thoracic Surgeons thymic database” with Paolo Mendogni as the first author. The study`s conclusion: *Complete resection should be achieved, even though extensive vascular reconstructions are required.*

The ESTS Thymic Working group was already a substantial contributor to the 8th edition TNM stage classification for thymic tumors (IASLC Staging and Prognostic Factors Committee). And again, many contributors to the prospective thymic database have completed/updated the

minimum datasets as well as follow-up so that the ESTS Thymic working group will be part of the upcoming 9th edition TNM stage classification for thymic tumors. Organizations/institutions that provided complete and updated cases by December 31, 2021 will be recognized in the Staging Project and in all the accompanying publications related to the 9th revision of the TNM stage classification.

The ESTS prospective thymic database operated by KDATA allows data input by drop down menus. As many centers work with their own institutional databases, a novelty in participation to the ESTS Thymic Database is the possibility of 3rd party data imports. Please contact Dr. Stefano Passani (KDATA) for the possibility of 3rd party data imports (e.g. compatible .xls databases) if preferred.

After two virtual ESTS annual conferences in 2020 and 2021, as a consequence of travel constraints during the Covid19 pandemic, the ESTS Thymic working group can convene in person again in The Hague and discuss projects of the thymic database.

Once again, I want to thank all the ESTS thymic contributors for their ongoing valuable effort in providing data. Further I want to welcome the new contributors to join us in this important ESTS project!

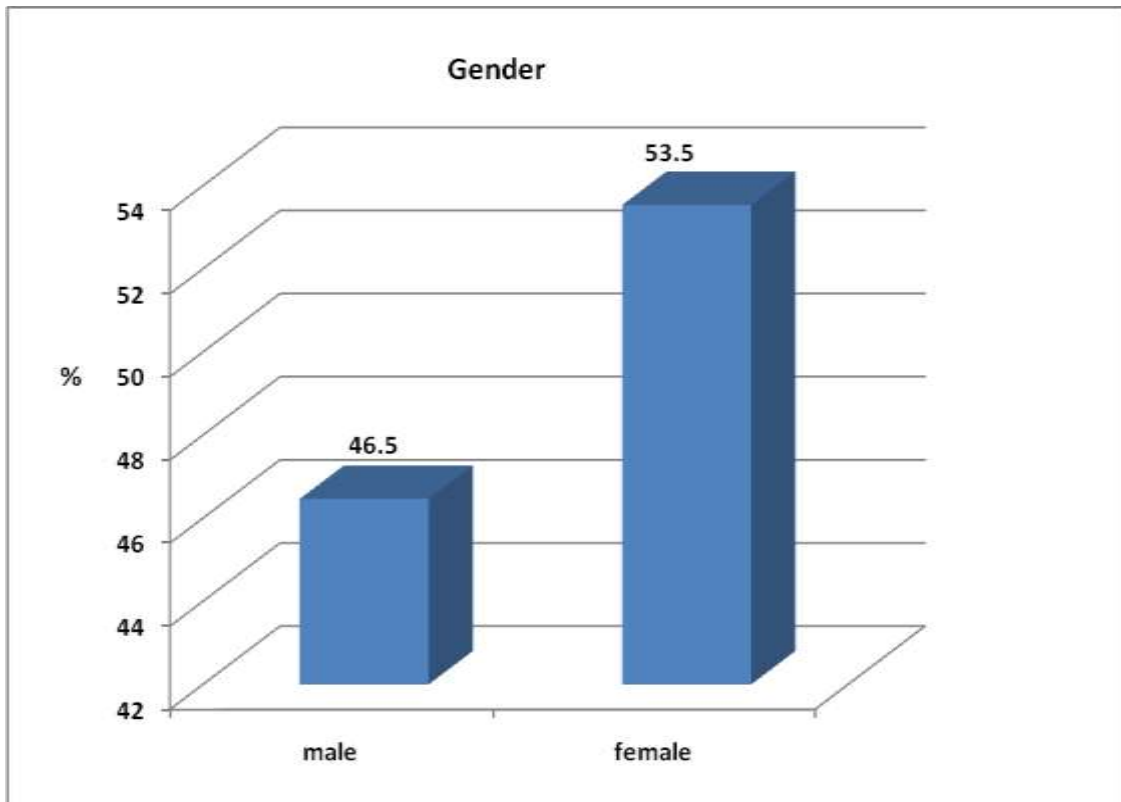
Dr. Bernhard Moser
Chair of the ESTS Thymic Working Group
bernhard.moser@meduniwien.ac.at

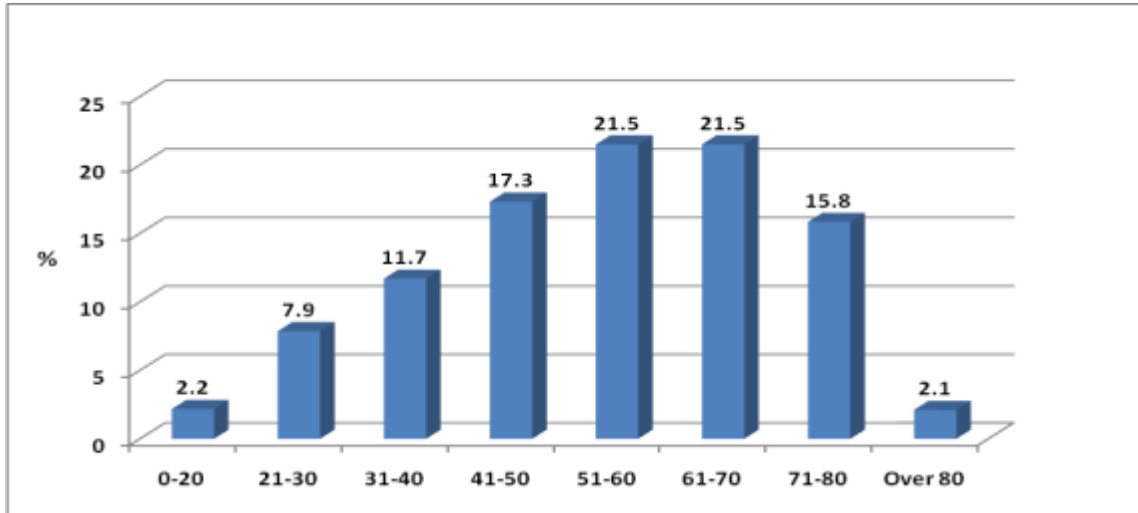
Thymoma Section fields

Thymic Tumors: prospective cases
January 2007- December 2021
N=3181

Demographics: gender and age groups

Gender	Occurrences	Percent
Male	1478	46.5
Female	1703	53.5
Total	3181	100.0



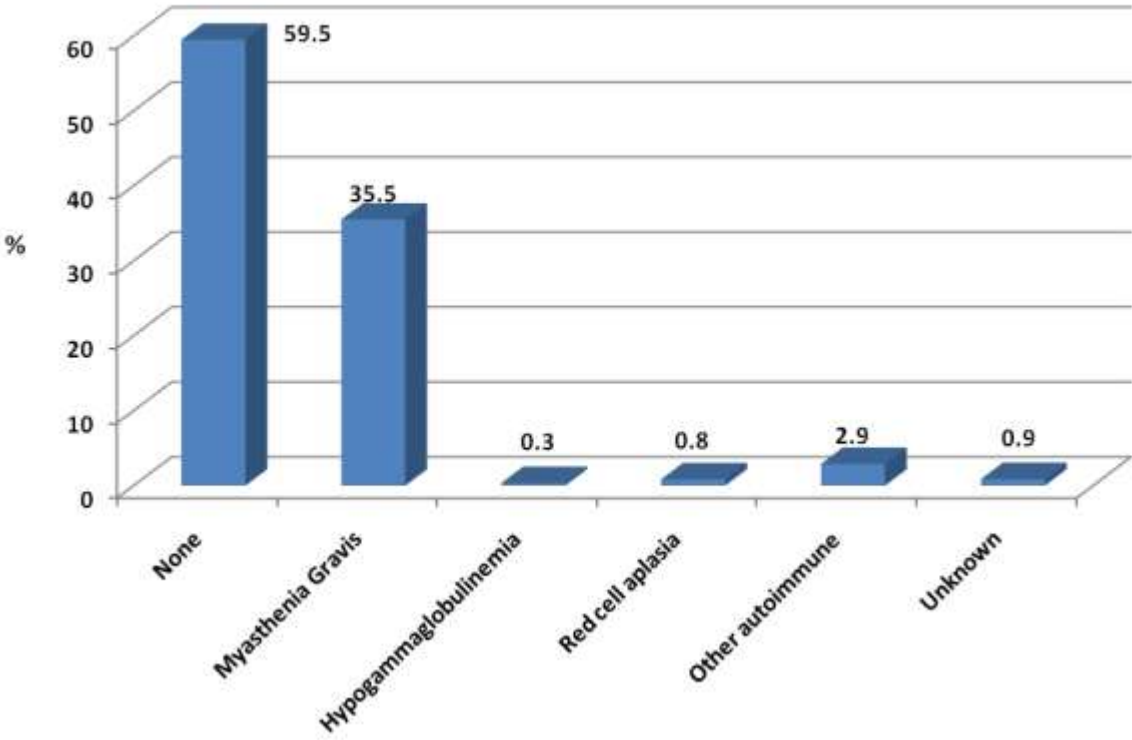


Associated paraneoplastic syndromes

Diagnosis of paraneoplastic -Autoimmune syndrome	Occurrences	Percent
None	1555	59.5
Myasthenia Gravis	928	35.5
Hypogammaglobulinemia	9	0.3
Red cell aplasia	22	0.8
Other autoimmune	76	2.9
Unknown	23	0.9
Total number of patients	2125	100

* Percentages calculated at the net of unknowns cases (N=602; 18.92%)

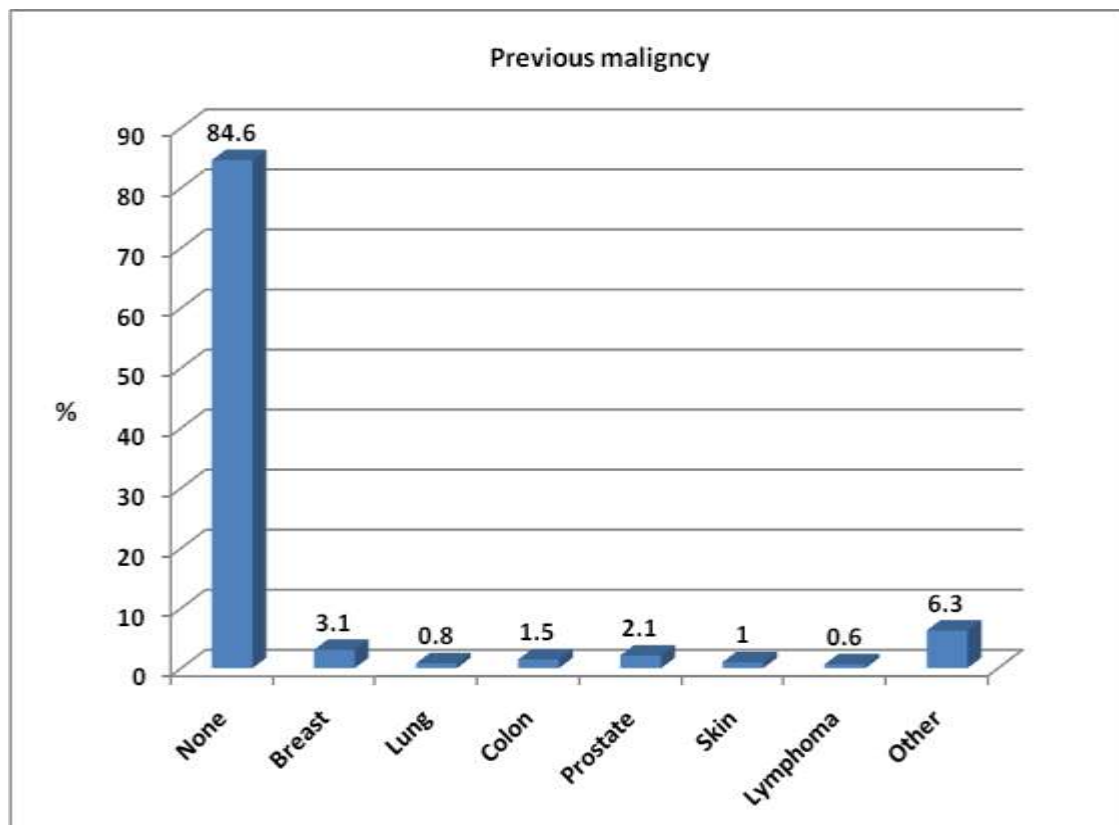
Diagnosis of paraneoplastic Autoimmune syndrome



Previous malignancy

Previous malignancy	Occurrences	Percent
None	1442	84.6
Breast	52	3.1
Lung	14	0.8
Colon	25	1.5
Prostate	36	2.1
Skin	17	1.0
Lymphoma	11	0.6
Other	107	6.3
Total number of patients	1704	100

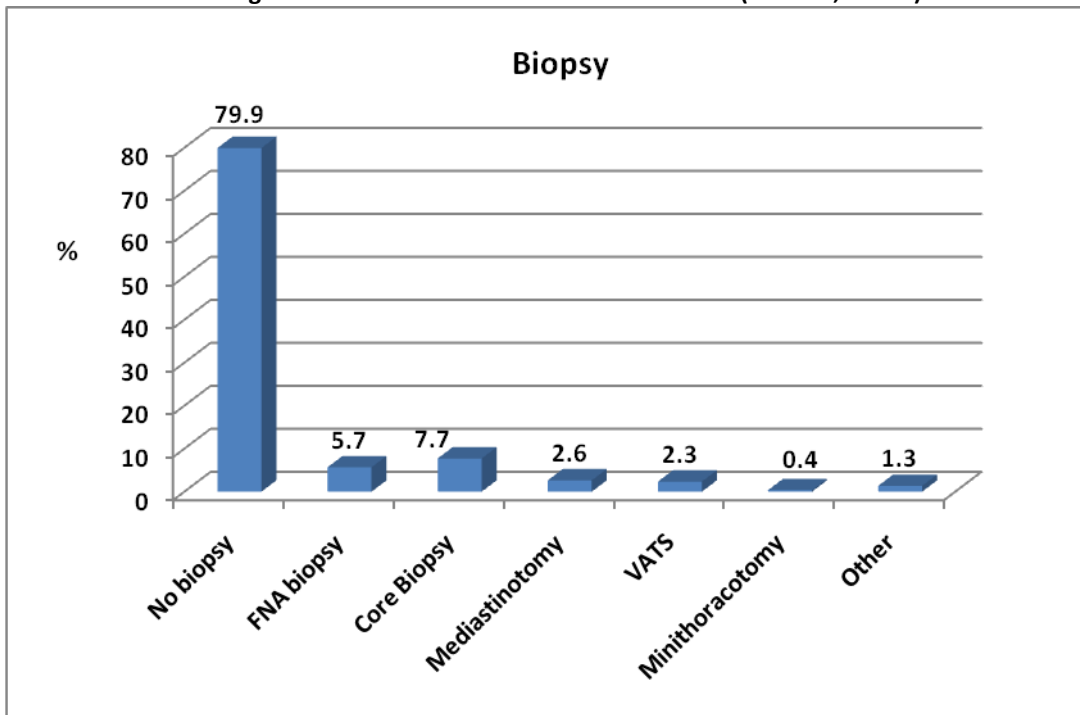
* Percentages calculated at the net of unknowns cases (N=1492; 46.9%)



Preoperative diagnosis

Biopsy	Occurrences	Percent
No biopsy	1367	79.9
FNA biopsy	97	5.7
Core Biopsy	132	7.7
Mediastinotomy	45	2.6
VATS	40	2.3
Minithoracotomy	6	0.4
Other	23	1.3
Total	1710	100.0

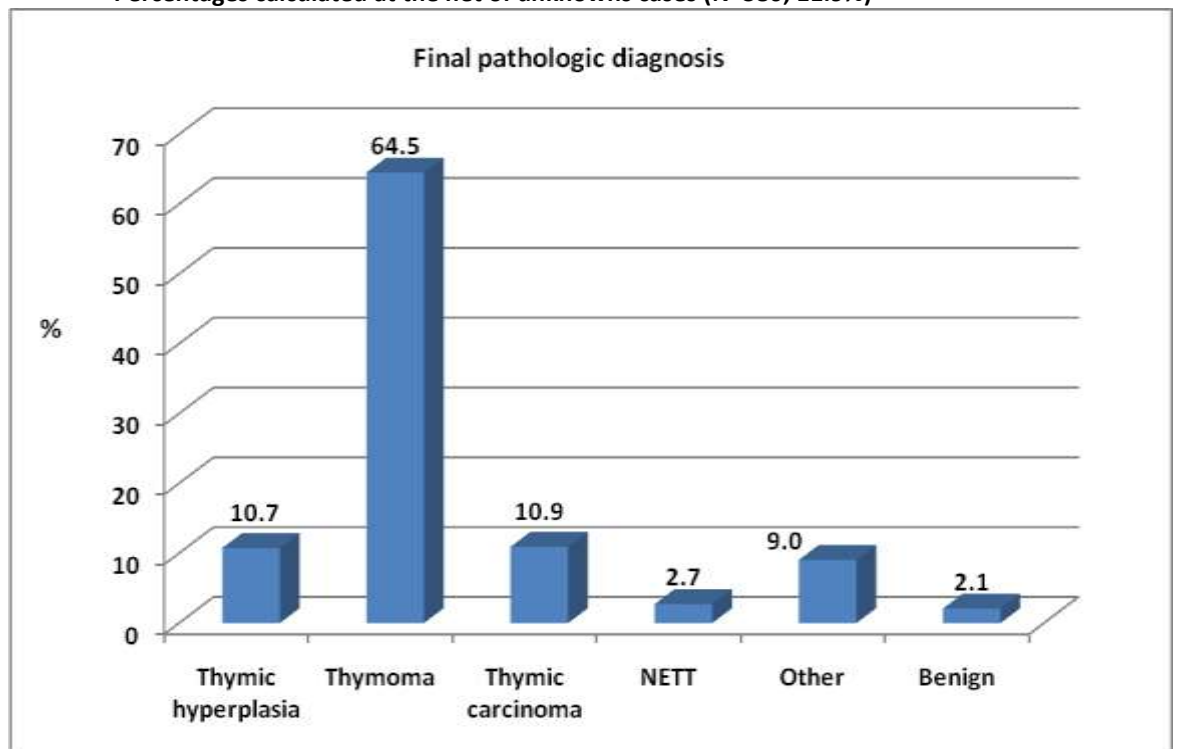
* Percentages calculated at the net of unknowns cases (N=1471; 46.2%)



Final pathologic diagnosis

Final pathologic diagnosis	Occurrences	Percent
Thymic hyperplasia	301	10.7
Thymoma	1807	64.5
Thymic carcinoma	306	10.9
NETT	76	2.7
Other	253	9.0
Benign	58	2.1
Total	2801	100.0

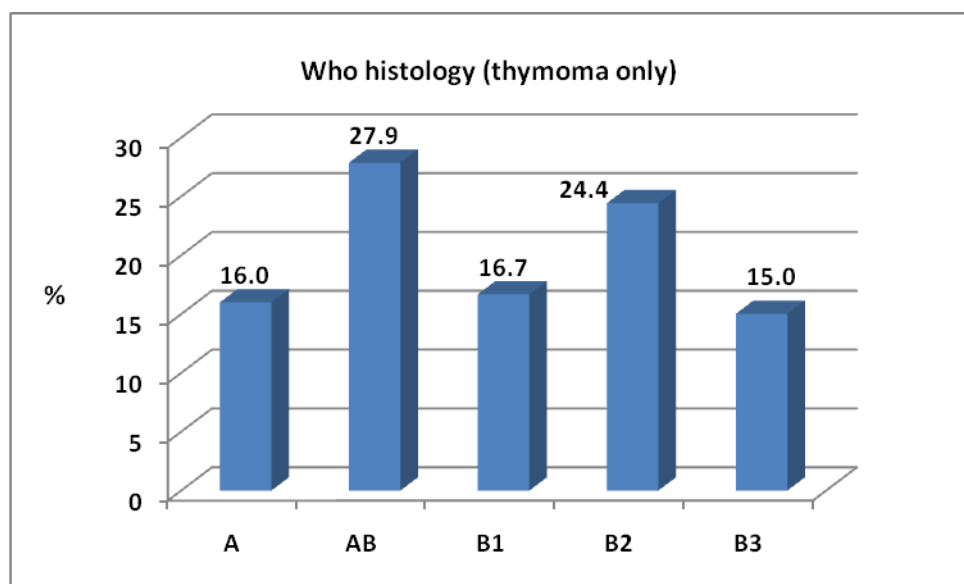
* Percentages calculated at the net of unknowns cases (N=380; 11.9%)



WHO histology (thymoma only)

WHO histology	Occurrences	Percent
A	279	16.0
AB	486	27.9
B1	291	16.7
B2	426	24.4
B3	262	15.0
Total	1744	100.0

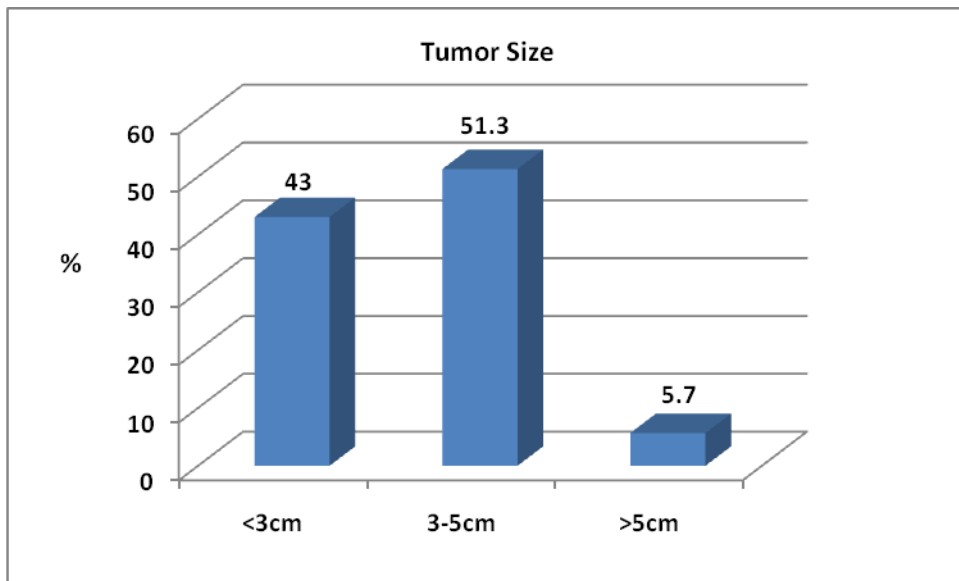
* Percentages calculated at the net of unknowns cases (N=145;7.7%)



Tumor size

Tumor size	Occurrences	Percent
<3cm	866	43.0
3-5cm	1033	51.3
>5cm	114	5.7
Total	2013	100.0

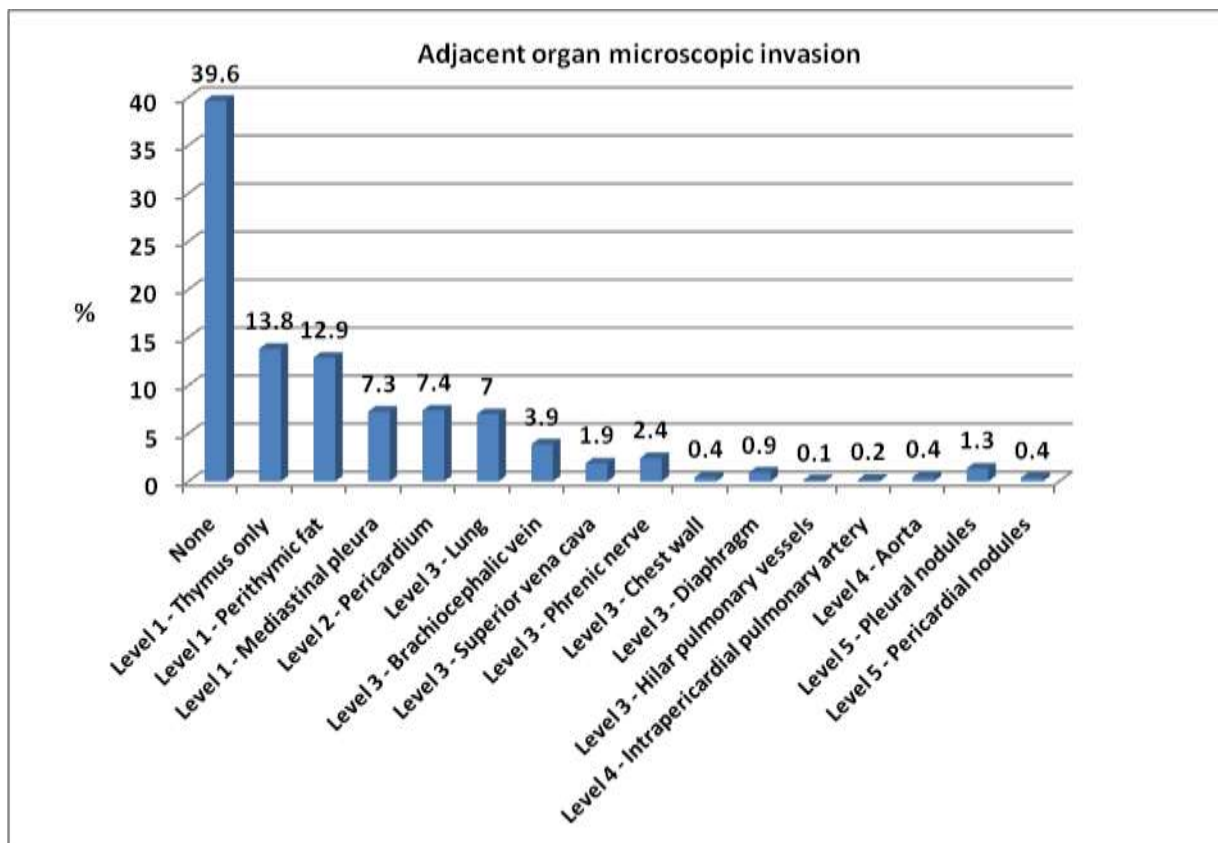
* Percentages calculated at the net of unknowns cases (N=1168; 36.7%)



Invasion to surrounding organs

Adjacent organ microscopic invasion	Occurrences	Percent
None	944	39.6
Level 1 - Thymus only	329	13.8
Level 1 - Perithymic fat	307	12.9
Level 1 - Mediastinal pleura	173	7.3
Level 2 - Pericardium	176	7.4
Level 3 - Lung	167	7.0
Level 3 - Brachiocephalic vein	92	3.9
Level 3 - Superior vena cava	45	1.9
Level 3 - Phrenic nerve	58	2.4
Level 3 - Chest wall	10	0.4
Level 3 - Diaphragm	22	0.9
Level 3 - Hilar pulmonary vessels	3	0.1
Level 4 - Intrapericardial pulmonary artery	4	0.2
Level 4 - Aorta	10	0.4
Level 5 - Pleural nodules	32	1.3
Level 5 - Pericardial nodules	9	0.4
Total number of patients	2381	100

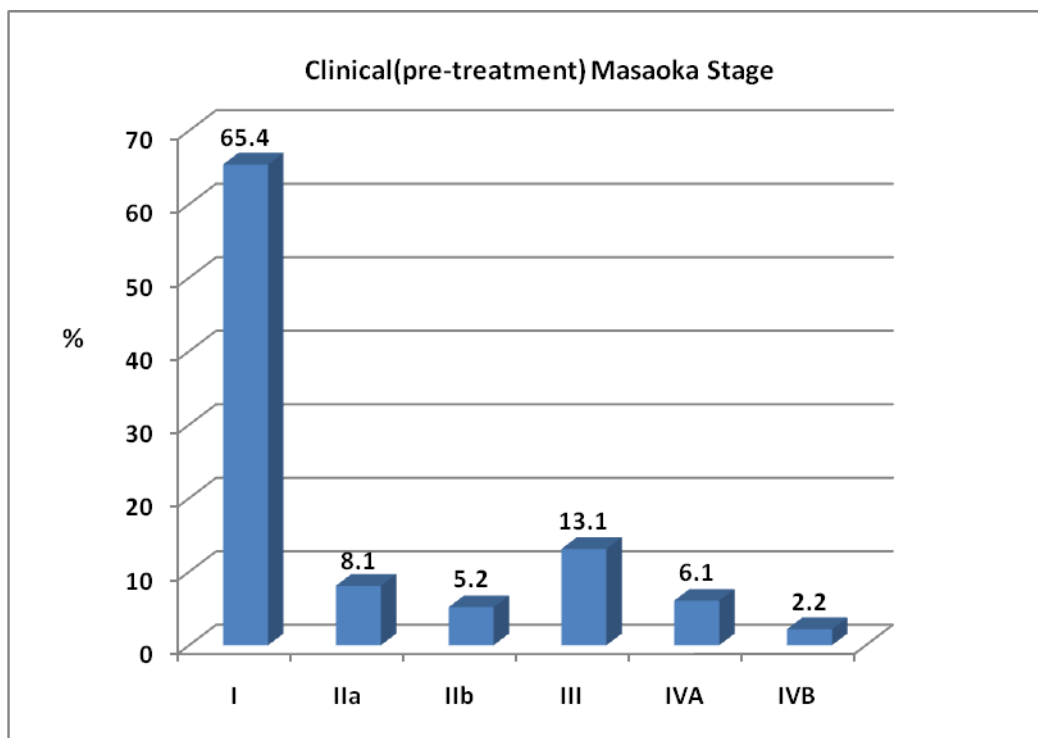
* Percentages calculated at the net of unknowns cases (N=1383;43.5%)



Clinical (pre-treatment) stage according to Masaoka-Koga

Clinical (pre-treatment) Masaoka Stage	Occurrences	Percent
I	672	65.2
Ila	809	65.4
Ilb	100	8.1
III	64	5.2
IVA	162	13.1
IVB	75	6.1
Total	1237	100.0

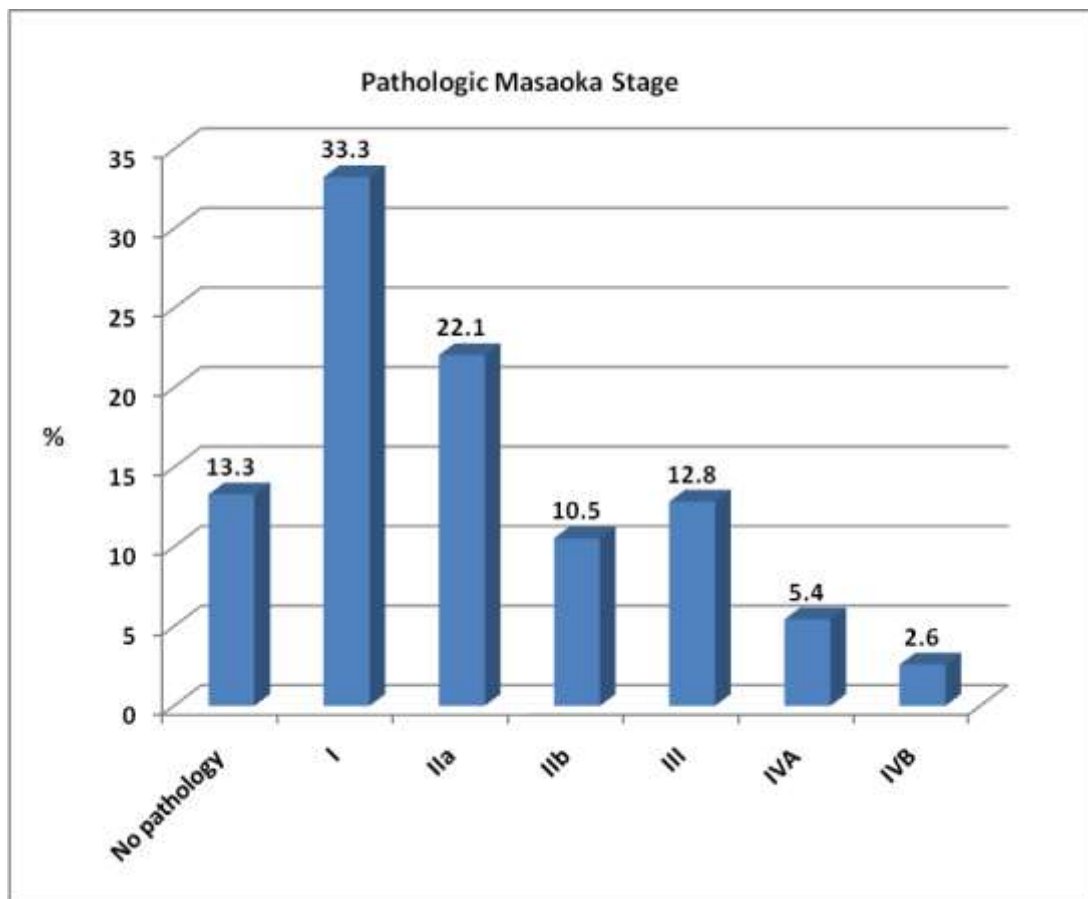
* Percentages calculated at the net of unknowns cases (N=1944;61.1%)



Pathologic Masaoka-Koga stage

Pathologic Masaoka Stage	Occurrences	Percent
No pathology	323	13.3
I	808	33.3
Ila	536	22.1
Iib	256	10.5
III	312	12.8
IVA	132	5.4
IVB	63	2.6
Total	2430	100.0

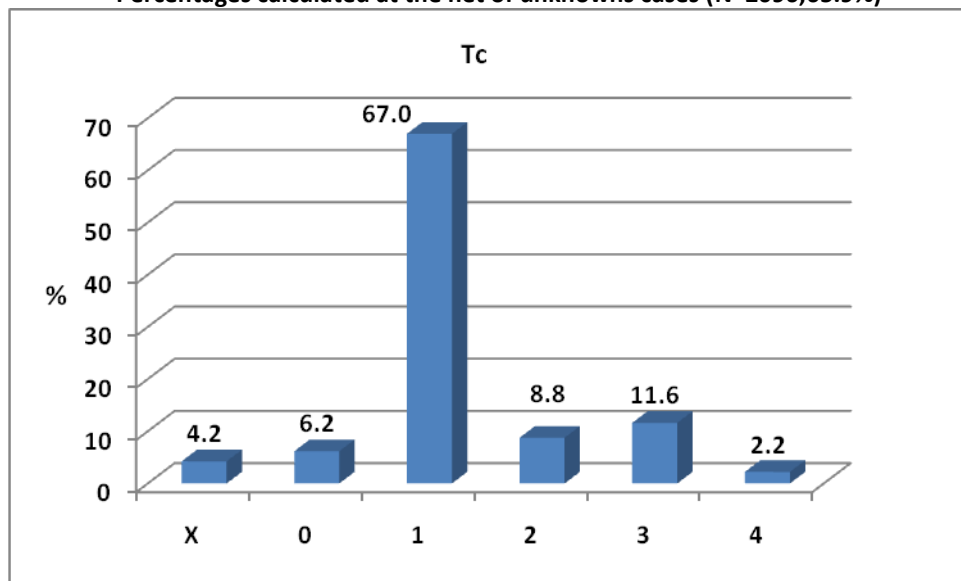
* Percentages calculated at the net of unknowns cases (N=751;23.6%)



Clinical TNM Staging

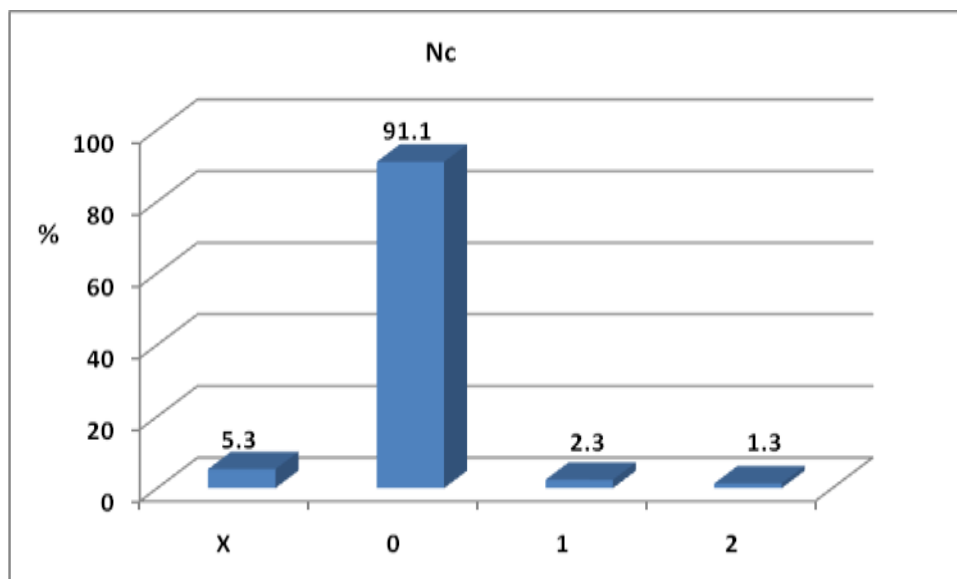
T Clinical	Occurrences	Percent
X	46	4.2
0	67	6.2
1	727	67.0
2	95	8.8
3	126	11.6
4	24	2.2
Total	1085	100.0

* Percentages calculated at the net of unknowns cases (N=2096;65.9%)



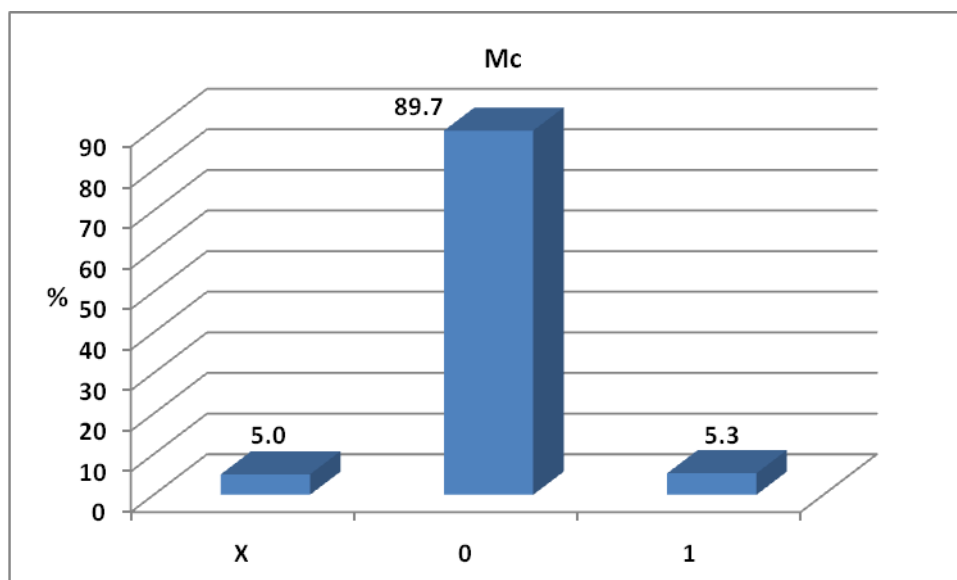
N Clinical	Occurrences	Percent
X	57	5.3
0	983	91.1
1	25	2.3
2	14	1.3
Total	1079	100.0

* Percentages calculated at the net of unknowns cases (N=2102;66%)



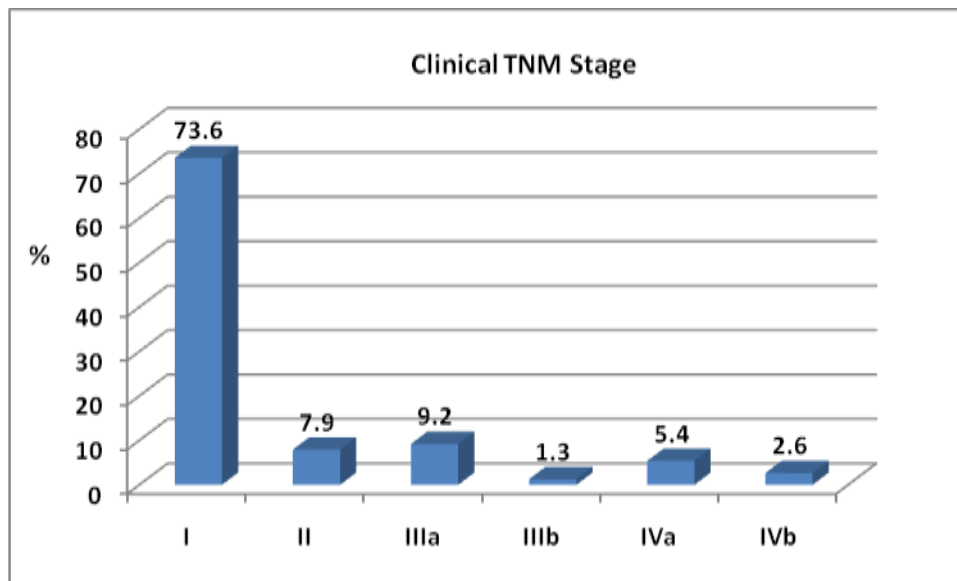
M Clinical	Occurrences	Percent
X	54	5.0
0	965	89.7
1	57	5.3
Total	1076	100.0

* Percentages calculated at the net of unknowns cases (N=2105;66.2%)



Clinical TNM Stage	Occurrences	Percent
I	696	73.6
II	75	7.9
IIIa	87	9.2
IIIb	12	1.3
IVa	51	5.4
IVb	25	2.6
Total	946	100.0

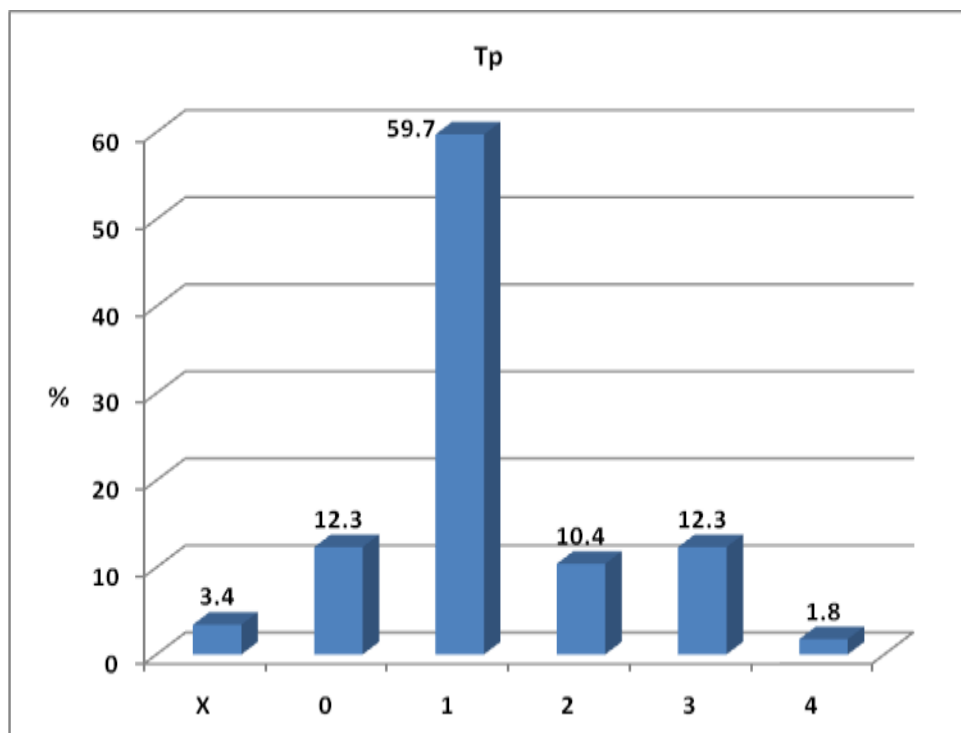
* Percentages calculated at the net of unknowns cases (N=2235;70.2%)



Pathologic TNM Staging

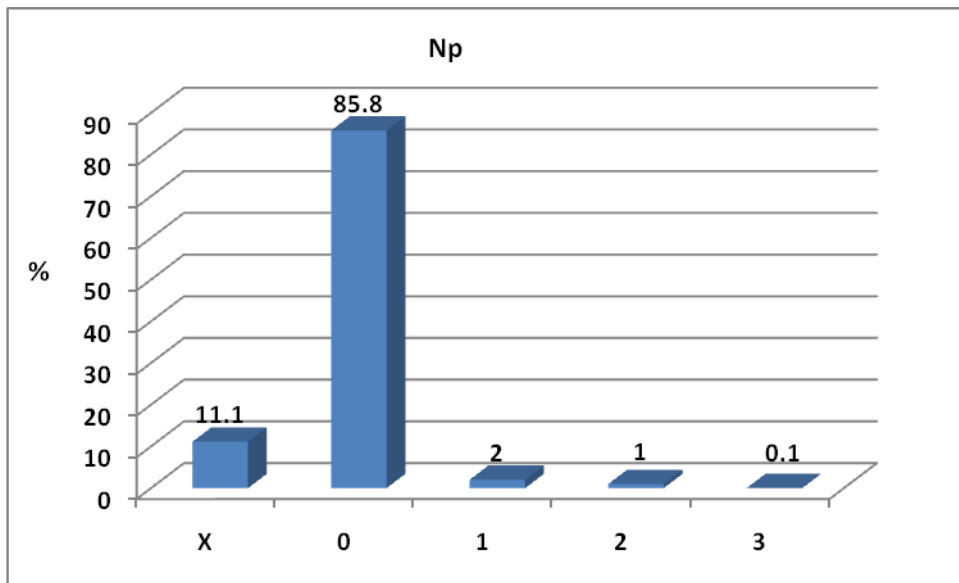
T pathology	Occurrences	Percent
X	66	3.4
0	238	12.3
1	1153	59.7
2	201	10.4
3	238	12.3
4	34	1.8
Total	1930	100.0

* Percentages calculated at the net of unknowns cases (N=1251;39.3%)



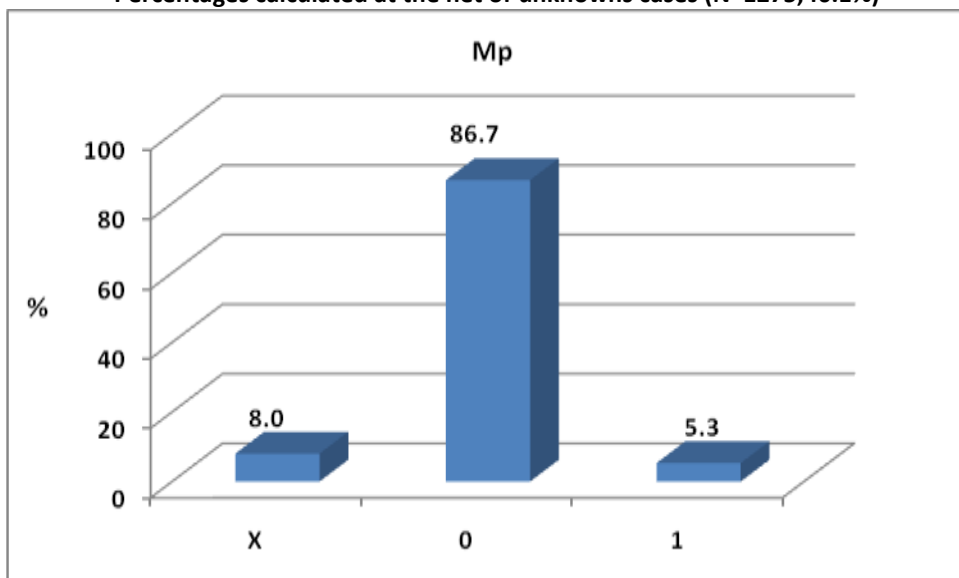
N pathology	Occurrences	Percent
X	192	11.1
0	1477	85.8
1	35	2.0
2	17	1.0
3	1	0.1
Total	1722	100.0

* Percentages calculated at the net of unknowns cases (N=1459;45.9%)



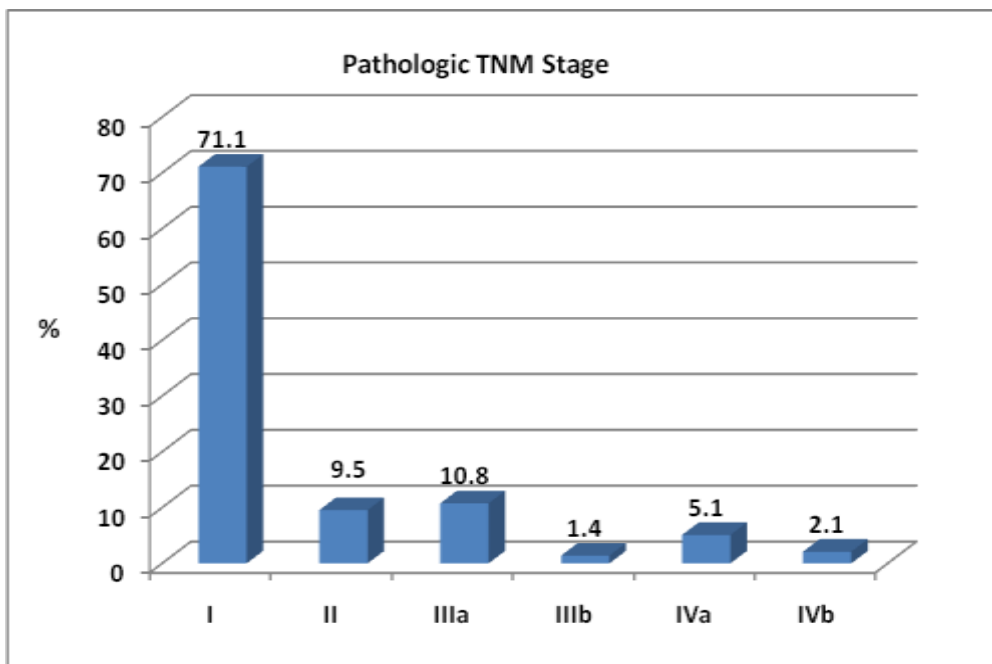
M pathology	Occurrences	Percent
X	153	8.0
0	1652	86.7
1	101	5.3
Total	1906	100.0

* Percentages calculated at the net of unknowns cases (N=1275;40.1%)



Pathologic TNM Stage	Occurrences	Percent
I	1117	71.1
II	150	9.5
IIIa	169	10.8
IIIb	22	1.4
IVa	80	5.1
IVb	33	2.1
Total	1571	100.0

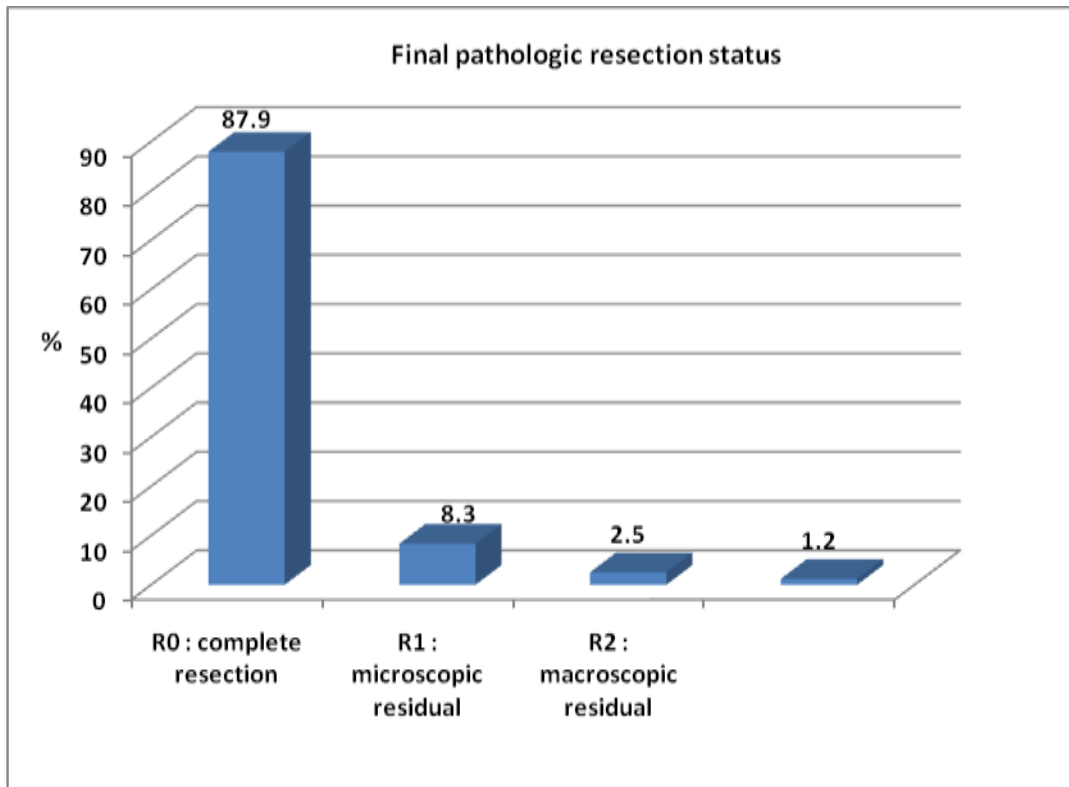
* Percentages calculated at the net of unknowns cases (N=1610;50.6%)



Final pathologic resection status

Final pathologic resection status	Occurrences	Percent
R0 : complete resection	2229	87.9
R1 : microscopic residual	211	8.3
R2 : macroscopic residual	64	2.5
RX : completeness of the resection unknown	31	1.2
Total	2535	100.0

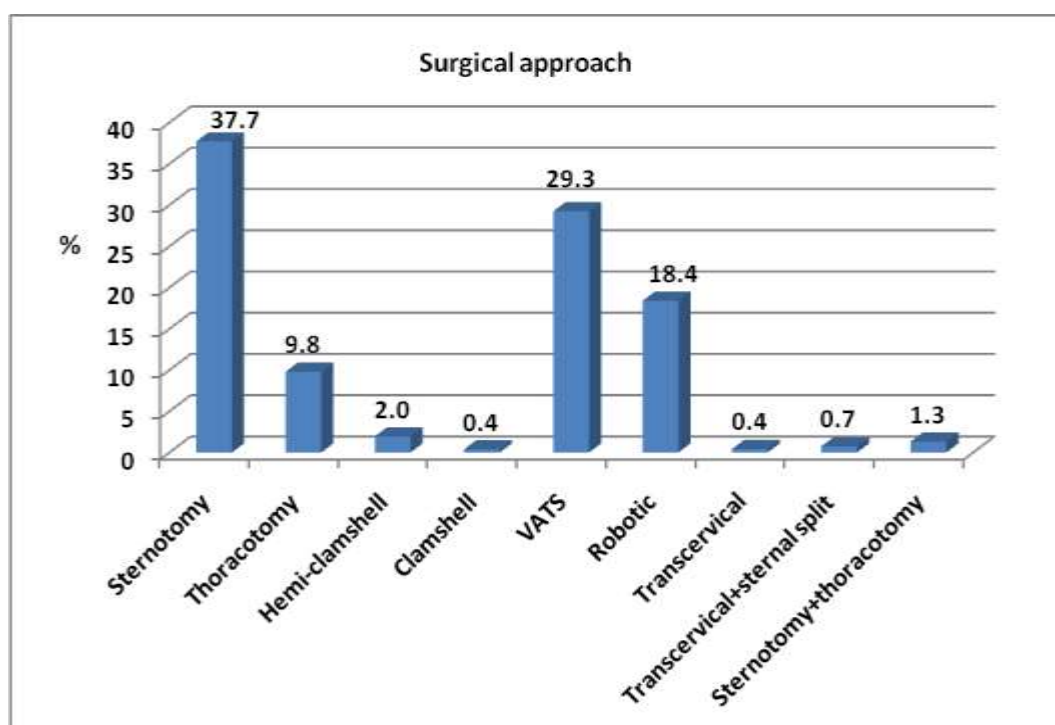
* Percentages calculated at the net of unknowns cases (N=646;20.3%)



Surgical approach

Surgical approach	Occurrences	Percent
Sternotomy	967	37.7
Thoracotomy	251	9.8
Hemi-clamshell	50	2.0
Clamshell	10	0.4
VATS	750	29.3
Robotic	472	18.4
Transcervical	11	0.4
Transcervical+sternal split	19	0.7
Sternotomy+thoracotomy	34	1.3
Total	2564	100.0

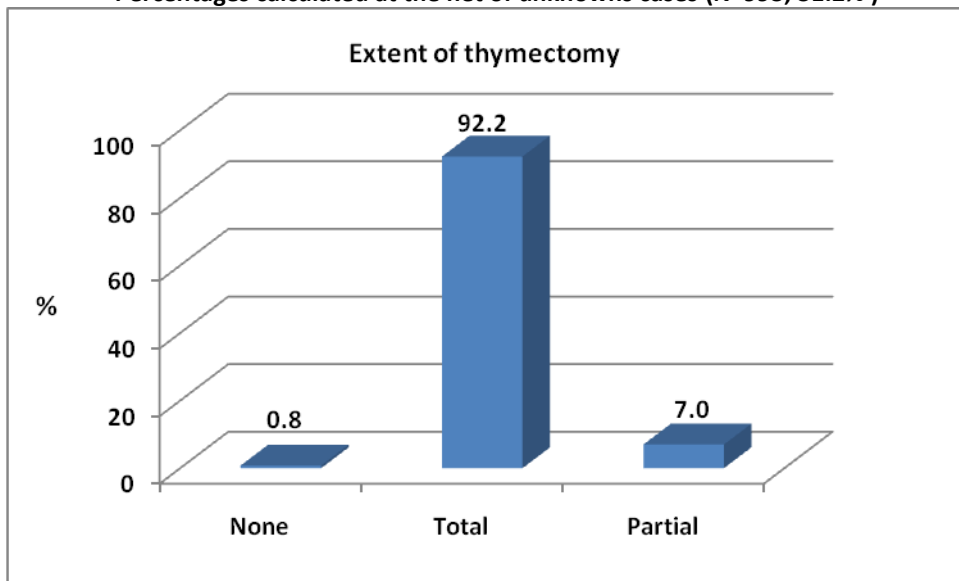
* Percentages calculated at the net of unknowns cases (N=617; 19.4%)



Extent of associated thymectomy

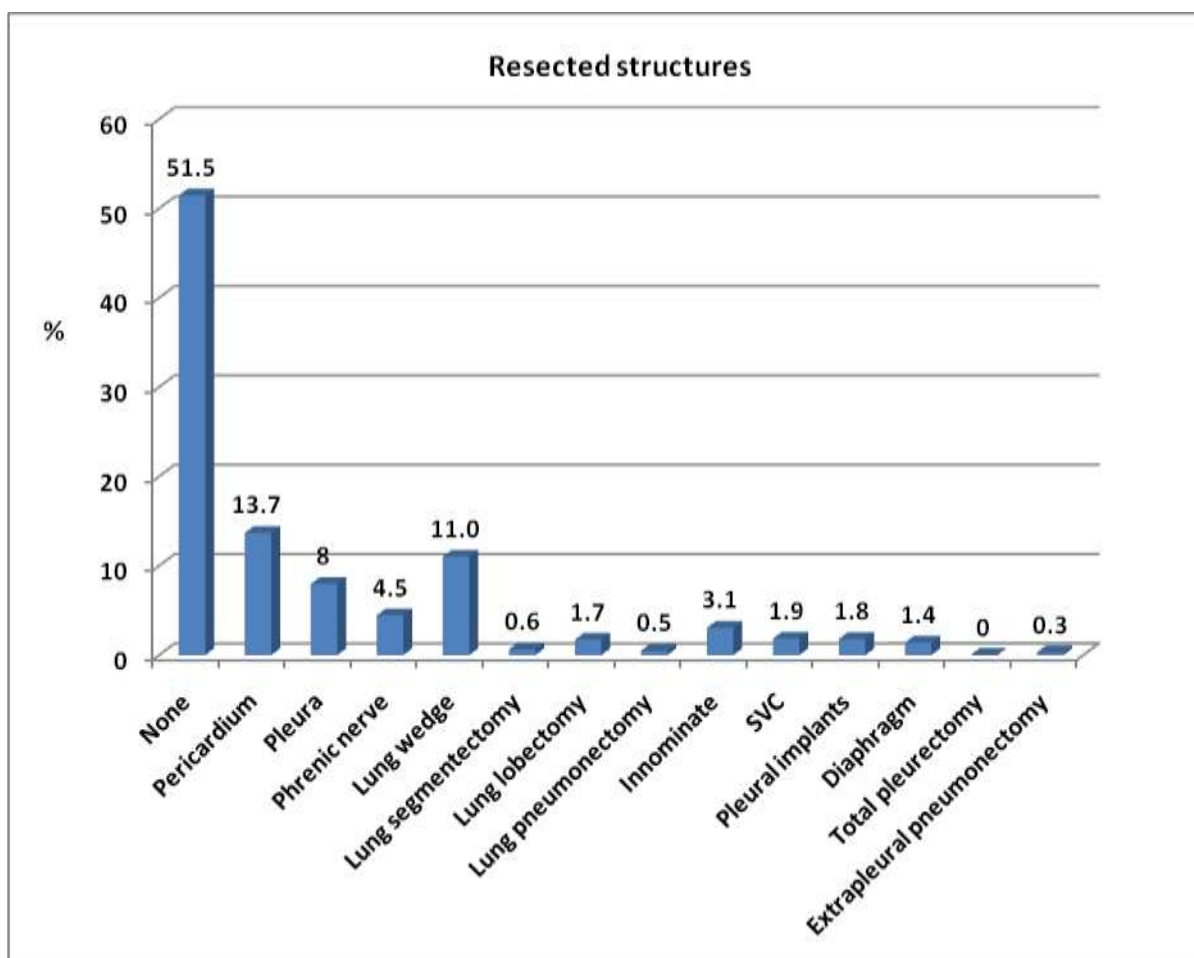
Extent of thymectomy	Occurrences	Percent
None	17	0.8
Total	2018	92.2
Partial	153	7.0
Total	2188	100.0

* Percentages calculated at the net of unknowns cases (N=993; 31.2%)



Resected structures associated with thymic tumor resection

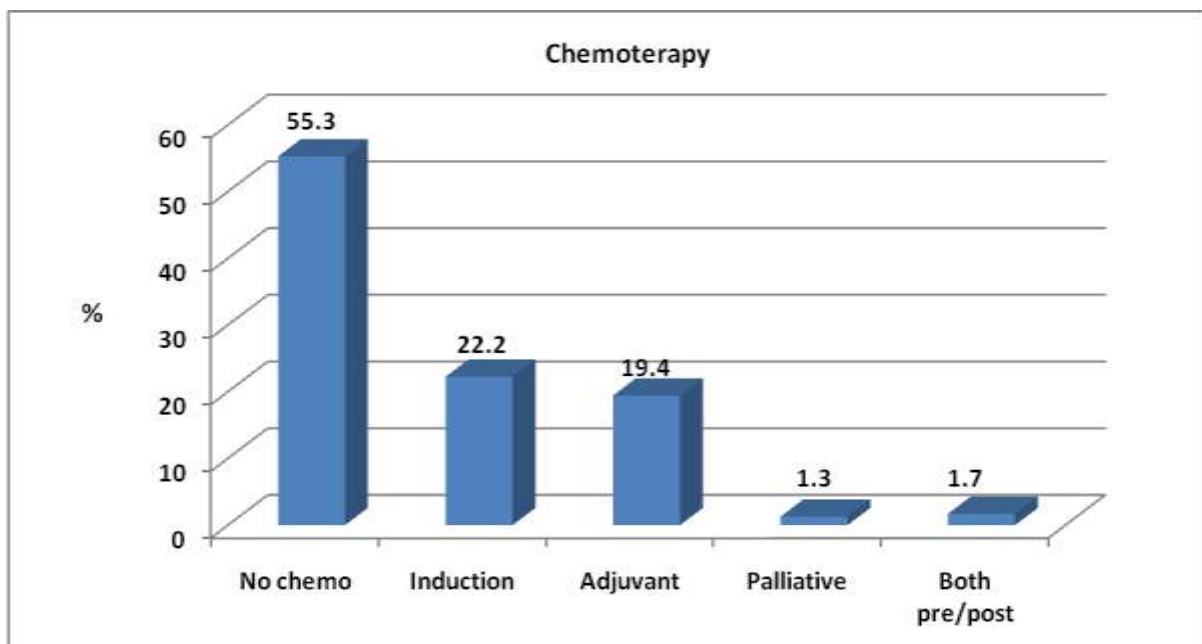
Resected structures	Occurrences	Percent
None	1278	51.5
Pericardium	340	13.7
Pleura	198	8.0
Phrenic nerve	111	4.5
Lung wedge	274	11.0
Lung segmentectomy	16	0.6
Lung lobectomy	43	1.7
Lung pneumonectomy	12	0.5
Innominate	76	3.1
SVC	46	1.9
Pleural implants	45	1.8
Diaphragm	35	1.4
Total pleurectomy	1	0.0
Extrapleural pneumonectomy	8	0.3
Total number of patients	2483	100



Chemotherapy

Chemotherapy	Occurrences	Percent
No chemo	256	55.3
Induction	103	22.2
Adjuvant	90	19.4
Palliative	6	1.3
Both pre/post	8	1.7
Total	463	100.0

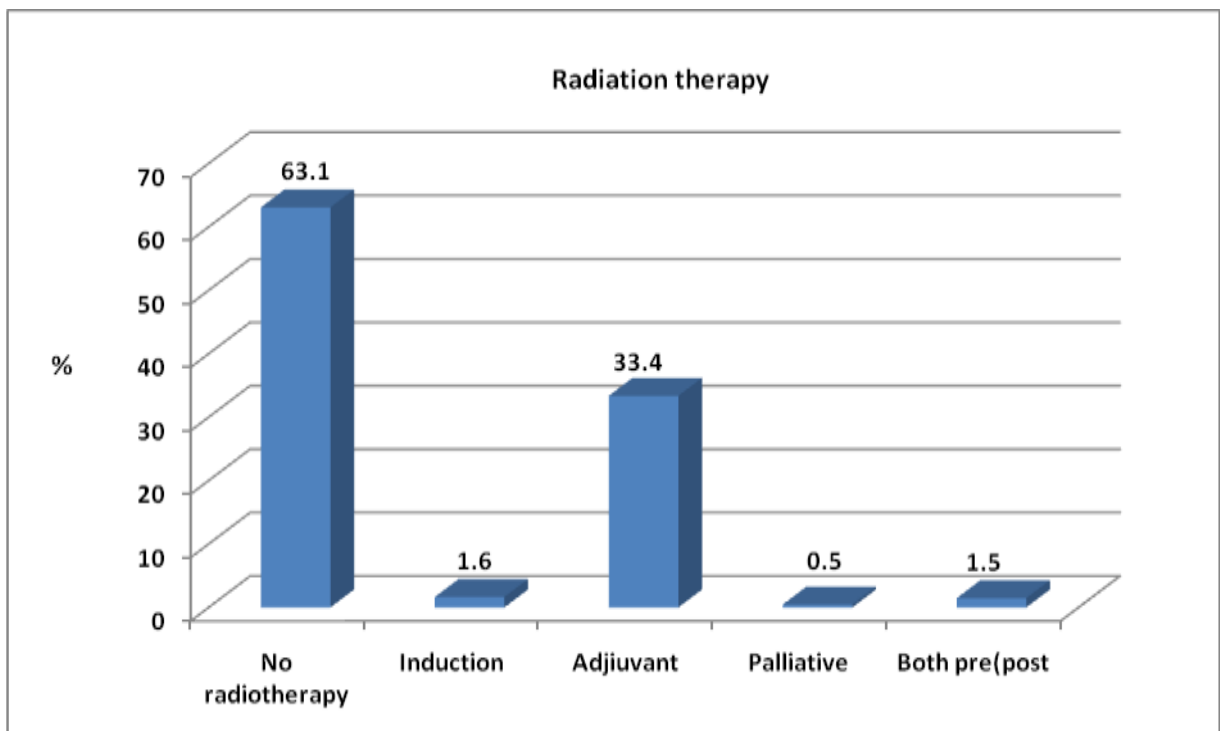
* Percentages calculated at the net of unknowns cases (N=2718;85.4%)



Radiotherapy

Radiation therapy	Occurrences	Percent
No radiotherapy	692	63.1
Induction	18	1.6
Adjuvant	366	33.4
Palliative	5	0.5
Both pre(post)	16	1.5
Total	1097	100.0

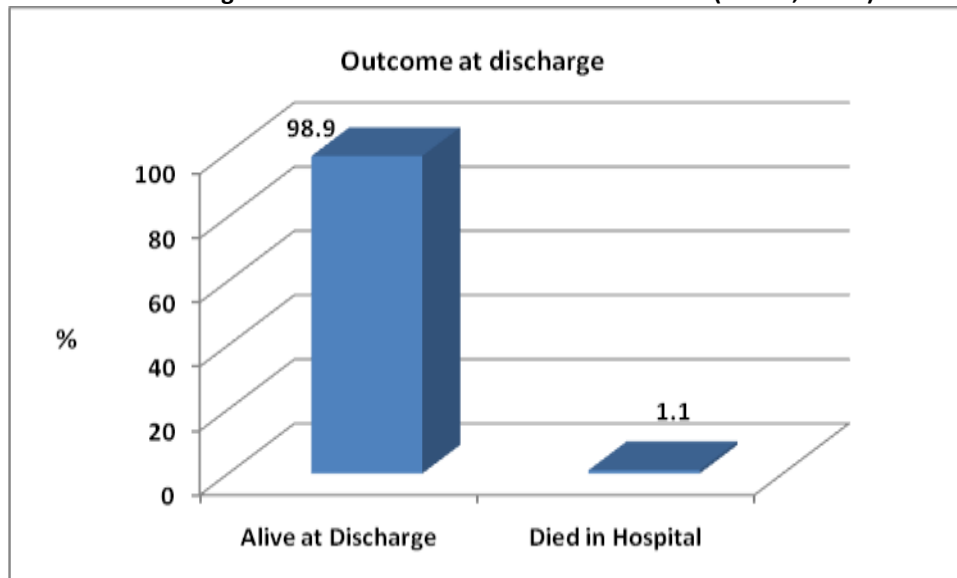
* Percentages calculated at the net of unknowns cases (N=2816;88.5%)



Outcome at hospital discharge

Outcome at Discharge	Occurrences	Percent
Alive at Discharge	2773	98.9
Died in Hospital	30	1.1
Total	2803	100.0

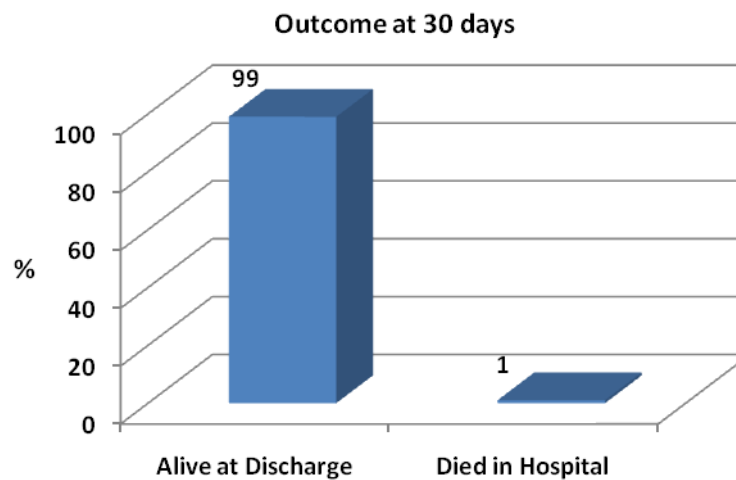
* Percentages calculated at the net of unknowns cases (N=378;11.9%)



Outcome at 30 days

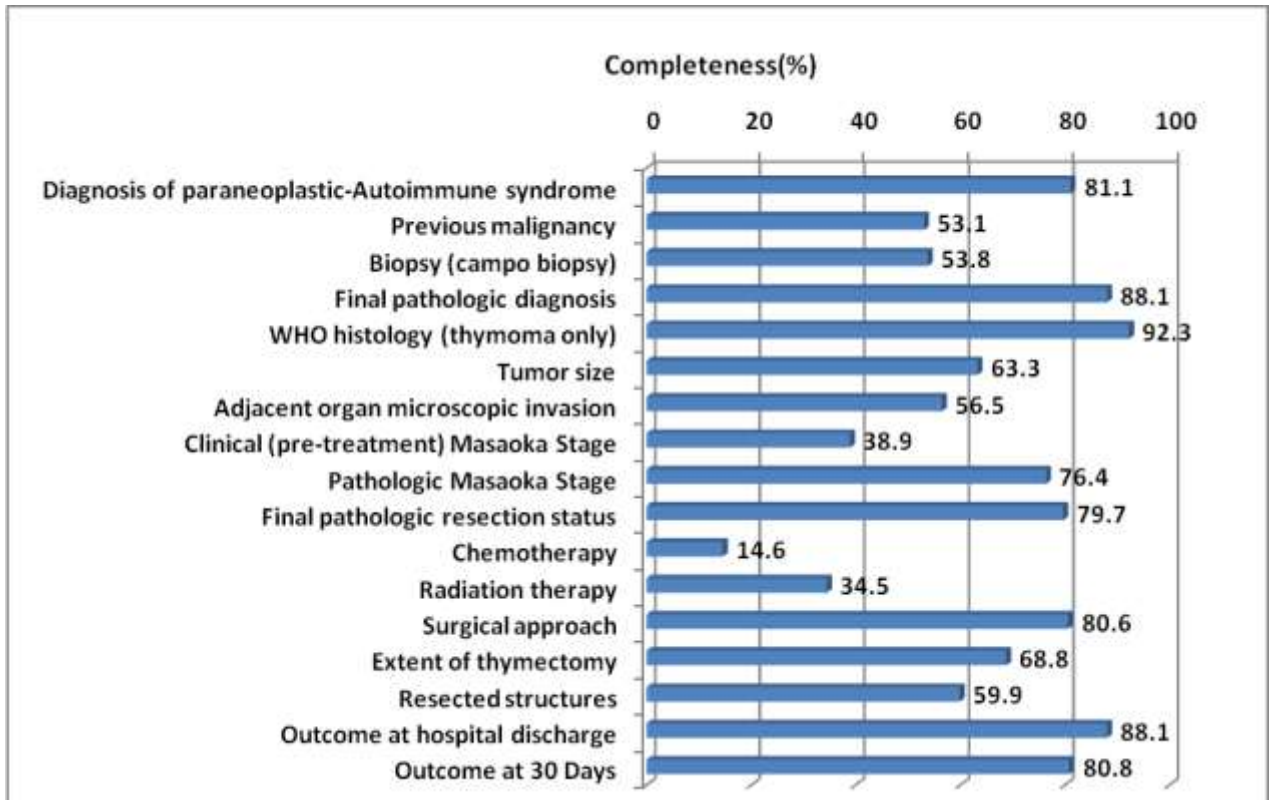
Outcome at 30 Days	Occurrences	Percent
Alive at Discharge	2545	99
Died in Hospital	26	1
Total	2571	100.0

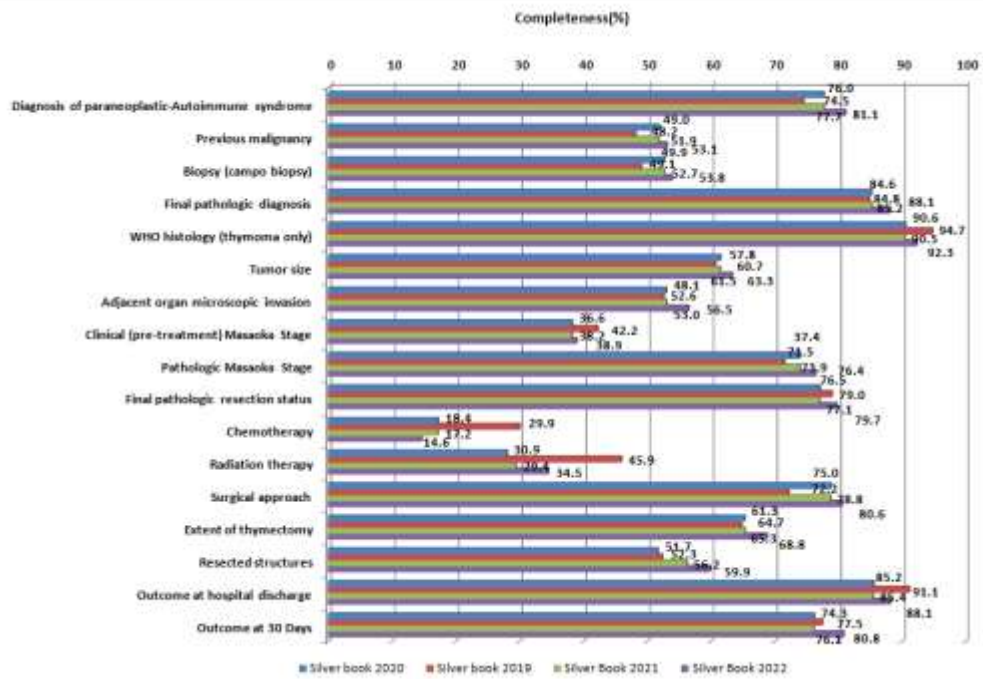
* Percentages calculated at the net of unknowns cases (N=610;19.2%)



Data Completeness

Name of Field	Unknown (%)	Completeness(%)
Diagnosis of paraneoplastic-Autoimmune syndrome	18.9	81.1
Previous malignancy	46.9	53.1
Biopsy (campo biopsy)	46.2	53.8
Final pathologic diagnosis	11.9	88.1
WHO histology (thymoma only)	7.7	92.3
Tumor size	36.7	63.3
Adjacent organ microscopic invasion	43.5	56.5
Clinical (pre-treatment) Masaoka Stage	61.1	38.9
Pathologic Masaoka Stage	23.6	76.4
Final pathologic resection status	20.3	79.7
Chemotherapy	85.4	14.6
Radiation therapy	65.5	34.5
Surgical approach	19.4	80.6
Extent of thymectomy	31.2	68.8
Resected structures	40.1	59.9
Outcome at hospital discharge	11.9	88.1
Outcome at 30 Days	19.2	80.8





PART 4

MESOTHELIOMA SECTION

(Database users only)

Message from Clinical Leader of the Mesothelioma section of ESTS Registry

Dr. Andrea Billè

Chair of the ESTS Mesothelioma Working Group

Andrea.Bille@gstt.nhs.uk



Dear Colleagues,

The ESTS mesothelioma registry has been established two years ago: 2437 cases of mesothelioma have been recorded in the registry. Sixty-three units have introduced cases in the Registry and 23 units have introduced more than 10 cases.

Best regards

Dr. Andrea Billè

Chair of the ESTS Mesothelioma Working Group

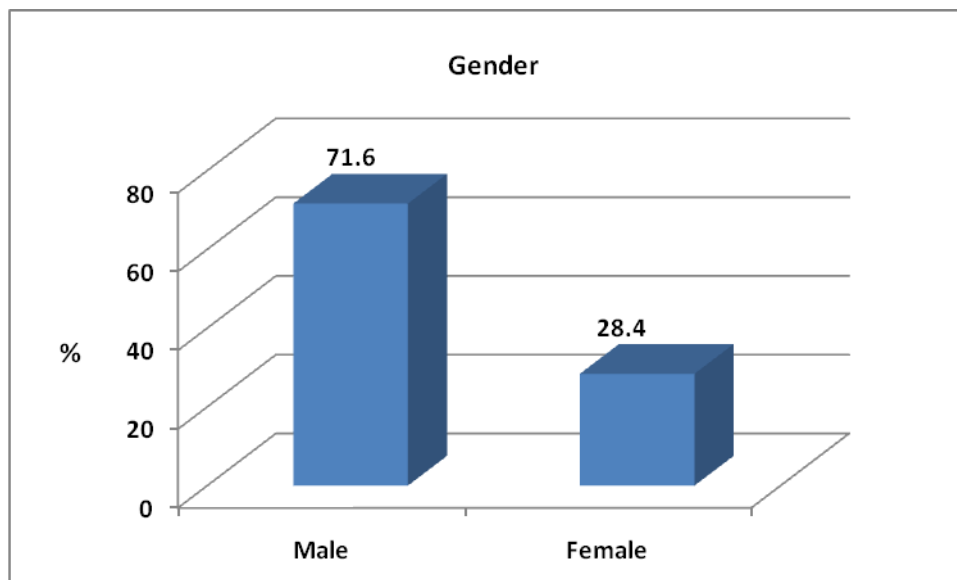
Andrea.Bille@gstt.nhs.uk

Mesothelioma Section fields

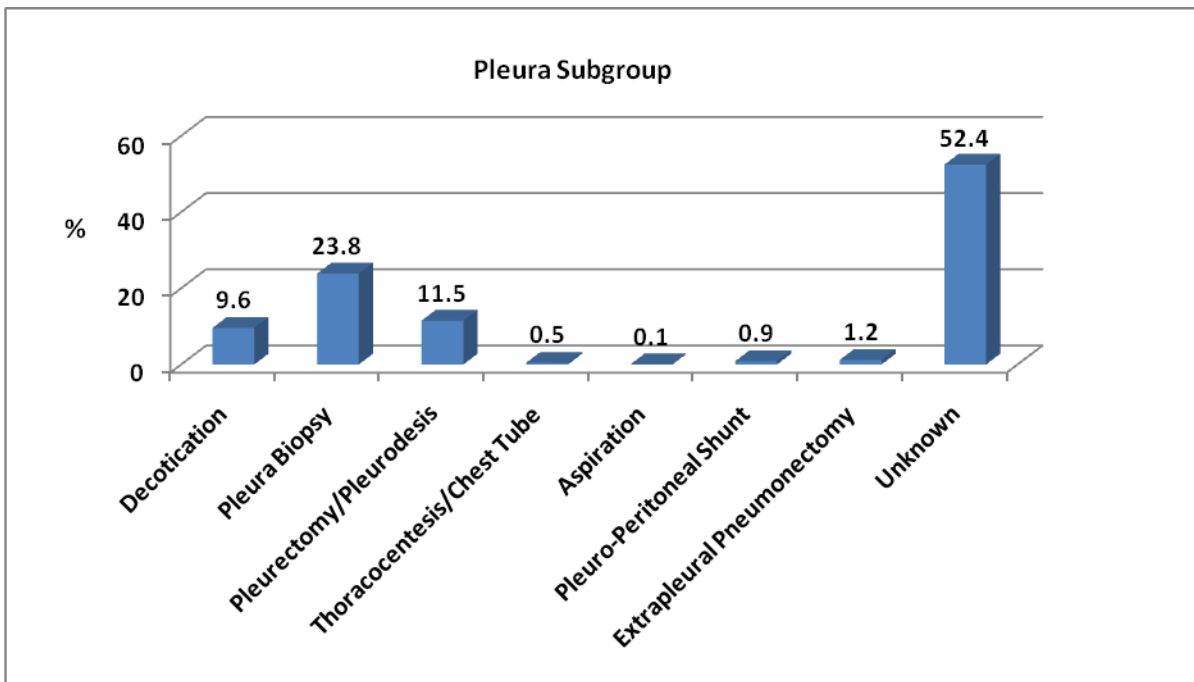
Group definition: Pleura – Diagnosis : Mesothelioma; prospective cases
January 1990- May 2022
N=2437

Demographics: gender

Gender	Occurrences	Percent
Male	1745	71.6
Female	692	28.4
Total	2437	100

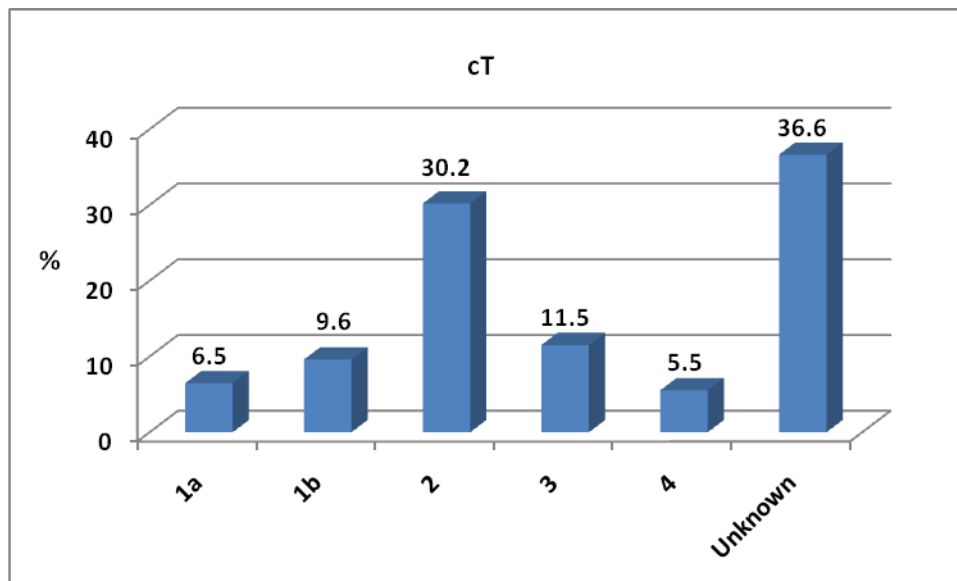


Pleura Subgroup	Occurrences	Percent
Decotication	234	9.6
Pleura Biopsy	581	23.8
Pleurectomy/Pleurodesis	281	11.5
Thoracocentesis/Chest Tube	11	0.5
Aspiration	2	0.1
Pleuro-Peritoneal Shunt	21	0.9
Extrapleural Pneumonectomy	29	1.2
Unknown	1278	52.4
Total	2437	100.0

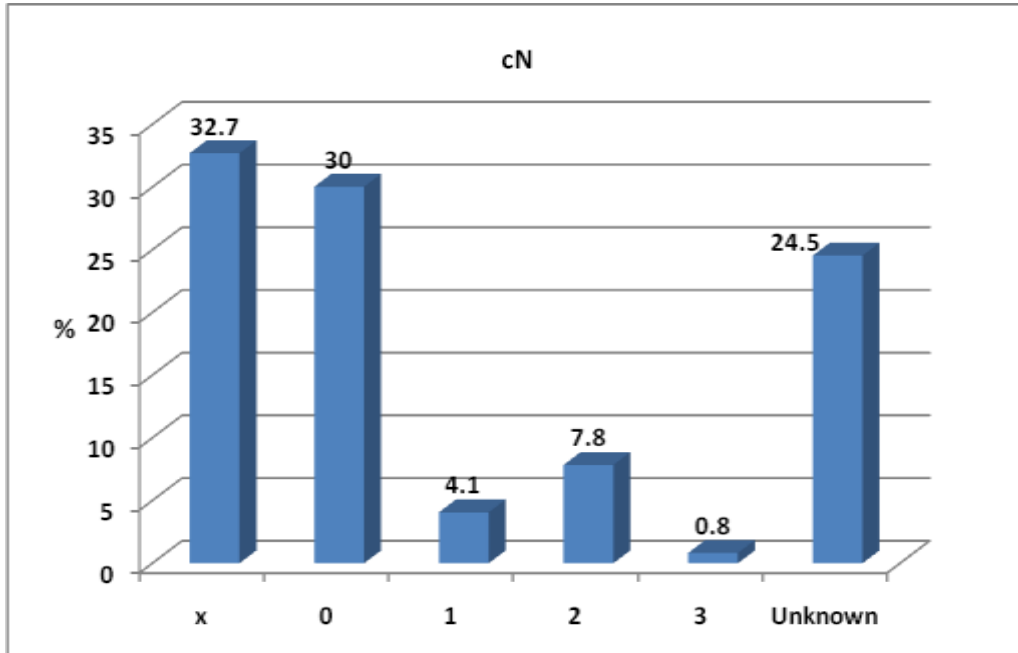


Clinical Staging : cT,cN,cM

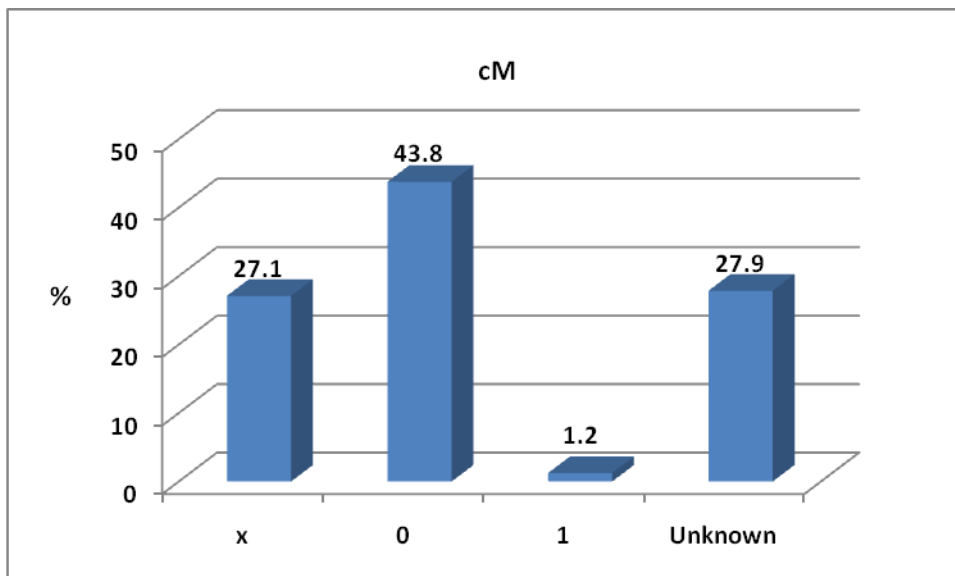
cT	Occurrences	Percent
1a	158	6.5
1b	234	9.6
2	736	30.2
3	281	11.5
4	135	5.5
Unknown	893	36.6
Total	2437	100.0



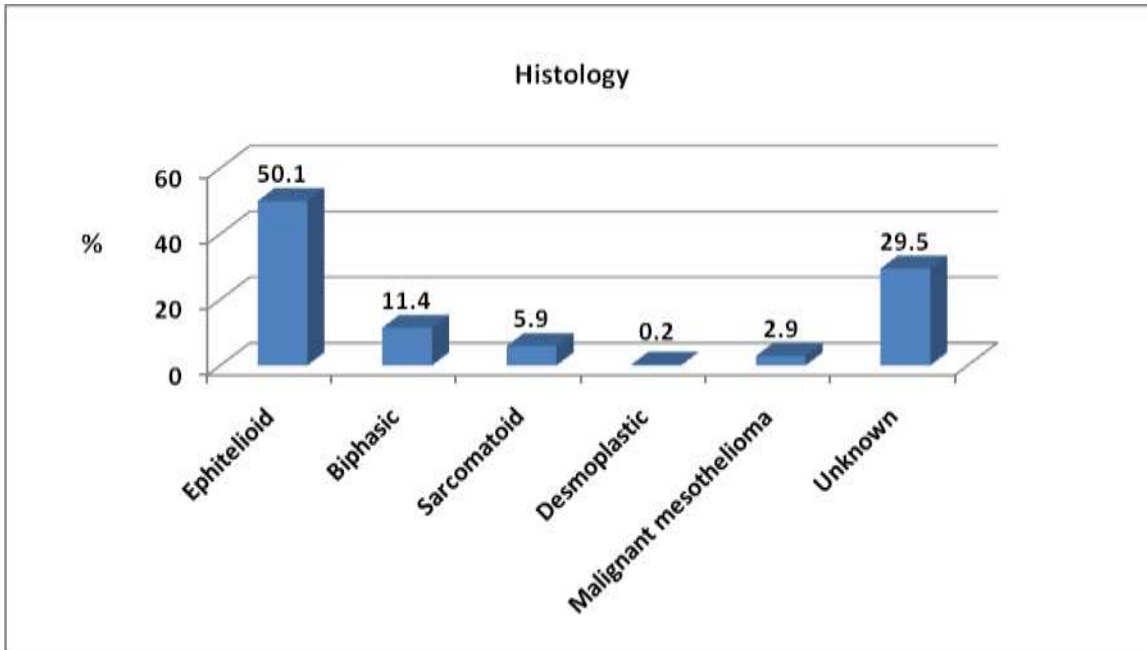
cN	Occurrences	Percent
X	797	32.7
0	732	30.0
1	99	4.1
2	191	7.8
3	20	0.8
Unknown	598	24.5
Total	2437	100.0



cM	Occurrences	Percent
X	661	27.1
0	1067	43.8
1	30	1.2
Unknown	679	27.9
Total	2437	100.0

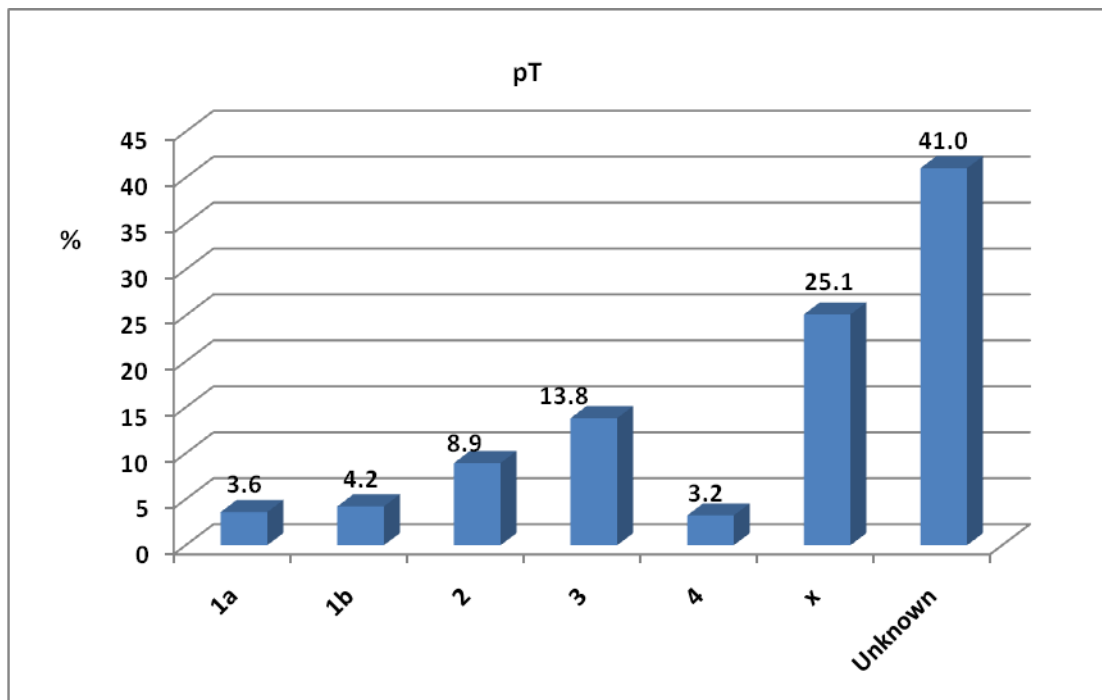


Histology	Occurrences	Percent
Ephitelioid	1220	50.1
Biphasic	279	11.4
Sarcomatoid	144	5.9
Desmoplastic	6	0.2
Malignant mesothelioma	70	2.9
Unknown	718	29.5
Total	2437	100.0

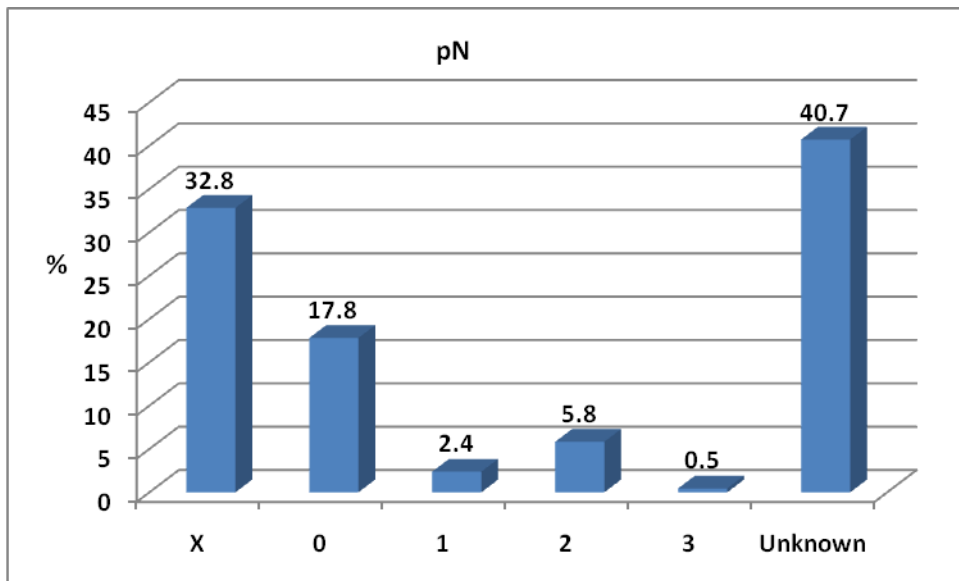


Pathological Staging : pT,pN,pM

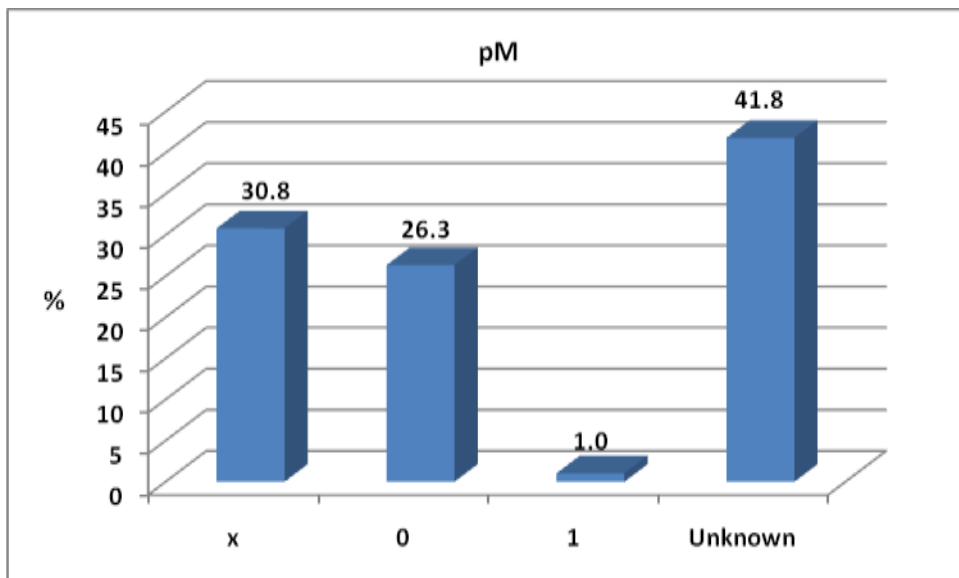
pT	Occurrences	Percent
1a	88	3.6
1b	103	4.2
2	218	8.9
3	337	13.8
4	79	3.2
X	612	25.1
Unknown	1000	41.0
Total	2437	100.0



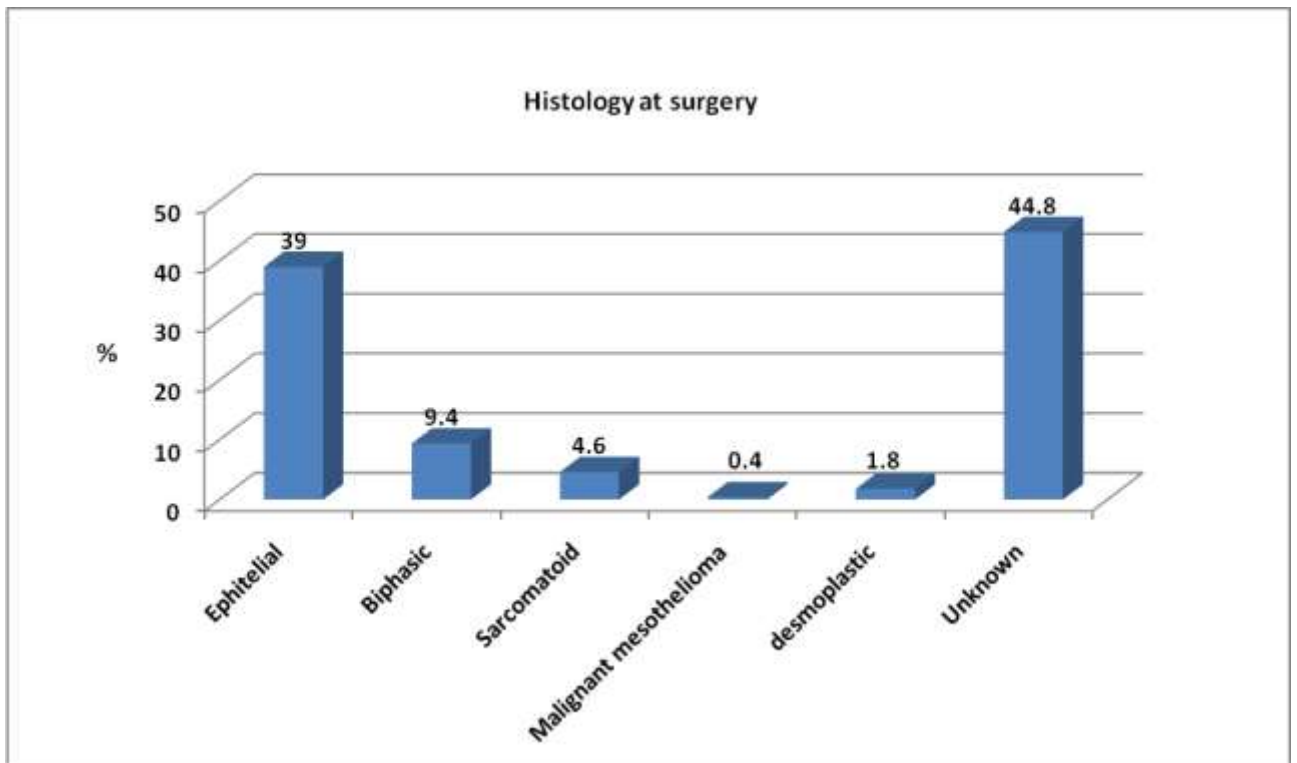
pN	Occurrences	Percent
X	800	32.8
0	434	17.8
1	58	2.4
2	142	5.8
3	11	0.5
Unknown	992	40.7
Total	2437	100.0



pM	Occurrences	Percent
X	751	30.8
0	642	26.3
1	25	1.0
Unknown	1019	41.8
Total	2437	100.0



Histology at surgery	Occurrences	Percent
Ephitelial	950	39.0
Biphasic	229	9.4
Sarcomatoid	112	4.6
Malignant mesothelioma	10	0.4
desmoplastic	44	1.8
Unknown	1092	44.8
Total	2437	100.0

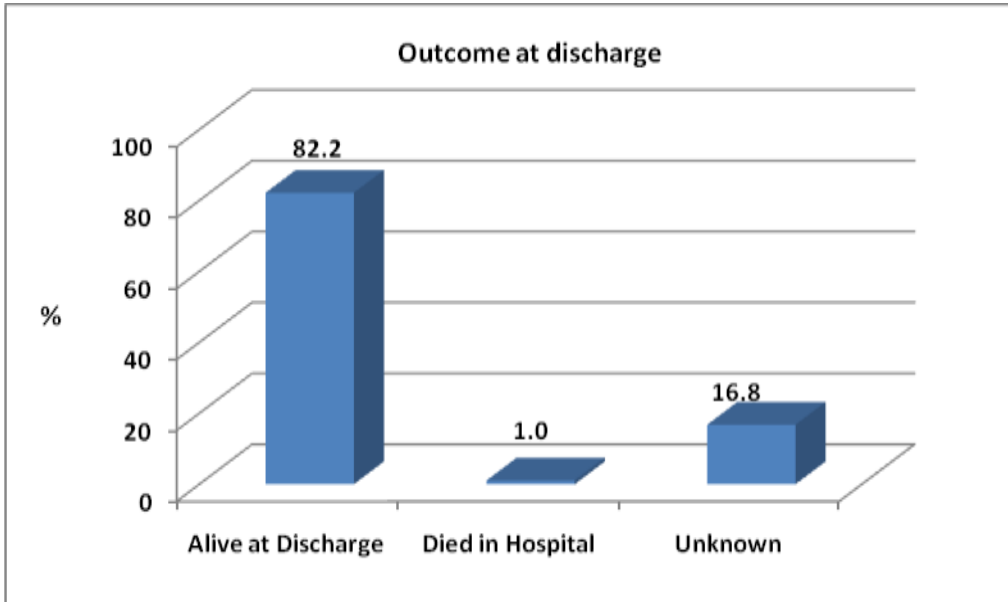


First Treatment at sequence	Occurrences	Percent
None	117	4.8
Surgery	364	14.9
Chemotherapy	365	15.0
Radiotherapy	7	0.3
Other	4	0.2
Unknown	1580	64.8
Total	2437	100.0

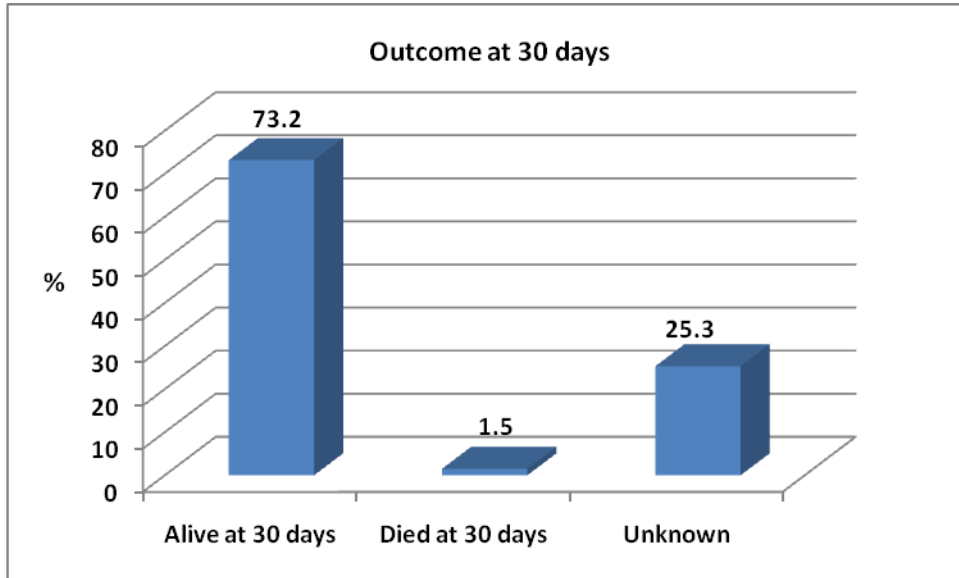
Second Treatment at sequence	Occurrences	Percent
None	168	6.9
Surgery	129	5.3
Chemotherapy	245	10.1
Radiotherapy	27	1.1
Other	10	0.4
Unknown	1858	76.2
Total	2437	100.0

Third Treatment at sequence	Occurrences	Percent
None	229	9.4
Surgery	7	0.3
Chemotherapy	26	1.1
Radiotherapy	85	3.5
Other	17	0.7
Unknown	2073	85.1
Total	2437	100.0

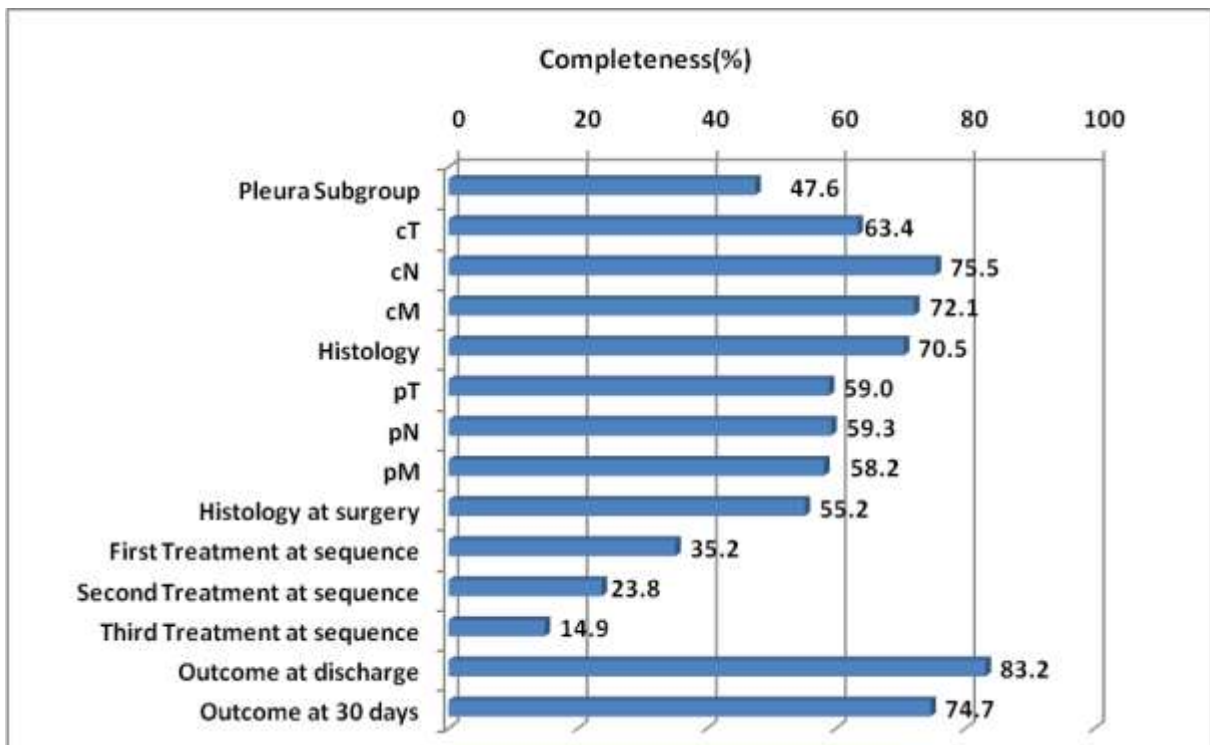
Outcome at discharge	Occurrences	Percent
Alive at Discharge	2003	82.2
Died in Hospital	25	1.0
Unknown	409	16.8
Total	2437	100.0

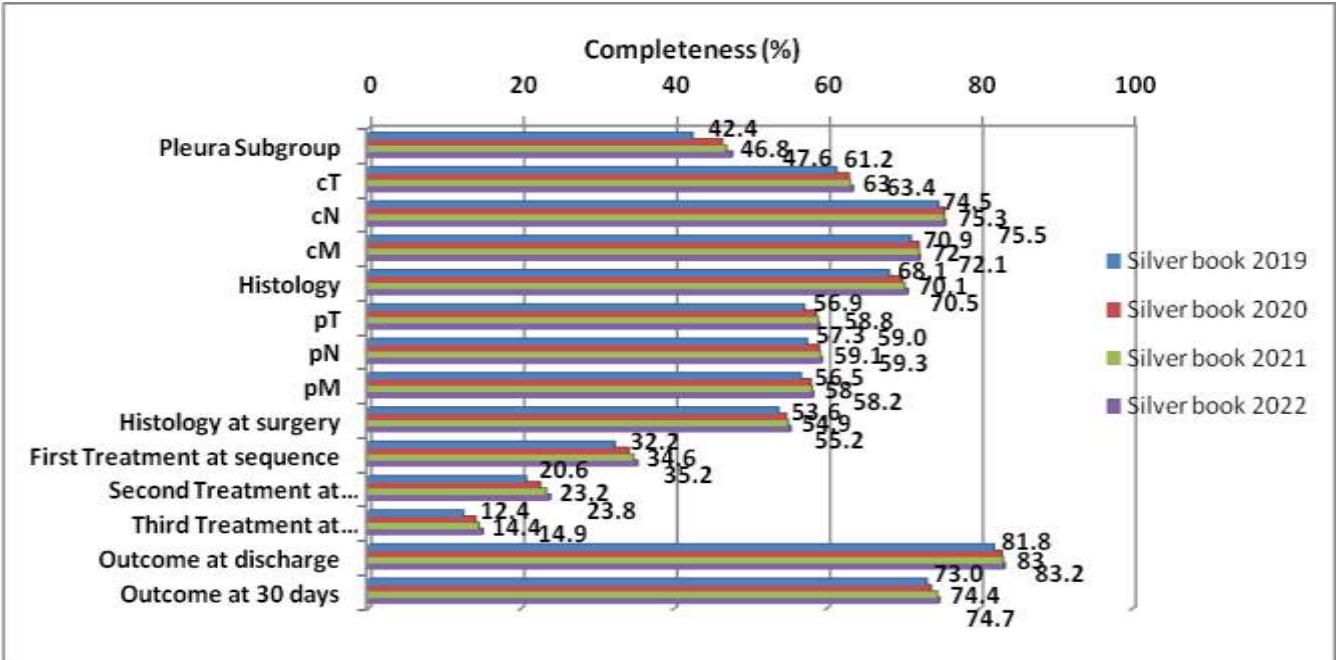


Outcome at 30 days	Occurrences	Percent
Alive at 30 days	1783	73.2
Died at 30 days	37	1.5
Unknown	617	25.3
Total	2437	100.0



Name of Field	Unknown (%)	Completeness(%)
Pleura Subgroup	52.4	47.6
cT	36.6	63.4
cN	24.5	75.5
cM	27.9	72.1
Histology	29.5	70.5
pT	41.0	59.0
pN	40.7	59.3
pM	41.8	58.2
Histology at surgery	44.8	55.2
First Treatment at sequence	64.8	35.2
Second Treatment at sequence	76.2	23.8
Third Treatment at sequence	85.1	14.9
Outcome at discharge	16.8	83.2
Outcome at 30 days	25.3	74.7





PART 5

NETTS SECTION (Database users only)

Message from Clinical Leader of ESTS Registry NETTS section

Lung NETs Database: the 10th year jubilee!



Dear Colleagues, dear Friends,

2022 is a very important date for all of us: ten years ago, in fact, during the 20th European Conference on General Thoracic Surgery in Essen, Germany, the Lung NETs Working Group project was presented and the ESTS lung NETs database was launched. So much has been achieved since then, with the help of all of you.

For the third time, this year, the NETs section has been included in the *ESTS Database Annual Report* (the so called “Silver Book”). A total of 1665 NETs cases (1505 in 2020), have been collected through our database, which has rapidly become one of the largest and most comprehensive in the world, specifically dedicated to these rare lung cancers. This extraordinary result is due to the enthusiastic input from the Centers which constantly upload and update their cases in the database. Once again, the average data completeness demonstrated to be very high, although further improvements are still possible by increasing the data mainly on:

- a) possible associated paraneoplastic syndromes;
- b) chemo-radiotherapy treatment;
- c) clinical resection status and
- d) outcome at discharge.

For the first time this year, in the Annual Meeting, there will be a lecture dedicated to the NETs database results during the Database Section. This will produce a paper for *EJCTS*, dedicated to the epidemiological results achieved on such a large number of operated patients. I am convinced that it will become the benchmark in the scientific literature for the forthcoming years.

Over the past two years, many other International Scientific Societies (especially Oncological ones) are taking an interest in our database: this on the one hand increases the popularity of the entire ESTS database, and on the other hand the international visibility of our. The next objectives of our Working Group must be aimed at:

- a) making the scientific community even more aware of these rare lung tumours, which have a very peculiar biological behaviour;
- b) implementing relations with other Scientific Societies dedicated to them;
- c) being more and more actively involved in the elaboration of guidelines for the multidisciplinary treatment of lung NETs;
- d) actively collaborating with Medical and Radiation Oncologists to determine the best treatments for locally advanced or metastatic tumor forms. All this work will result in a great recognition and a strong leadership position in the International Scientific Community that our group surely deserves.

On behalf of the ESTS Database Committee and the ESTS Leadership, I would like to personally thank all the Centers world wide that contributed to the success of this database.

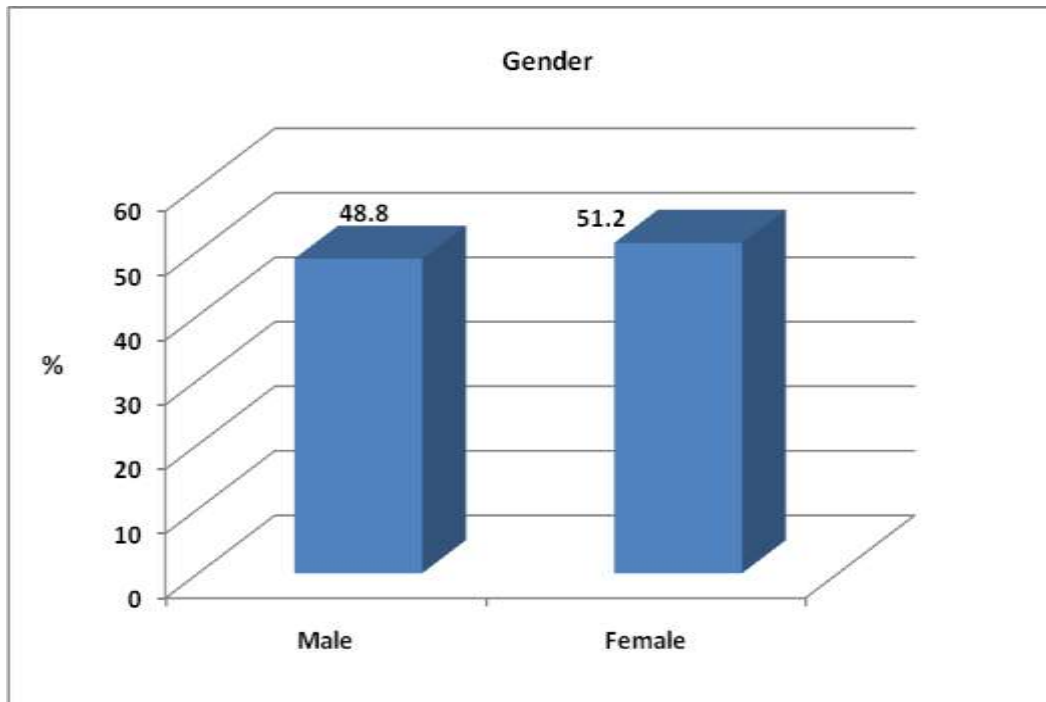
<p>Dr Pierluigi Filosso Chair NETTs Database pierluigi.filosso@unito.it</p>

NETTS Section fields

Group Definition : Lung And Diagnosis : Lung Cancer (NSCLC)
January 1980- December 2021
N=1665

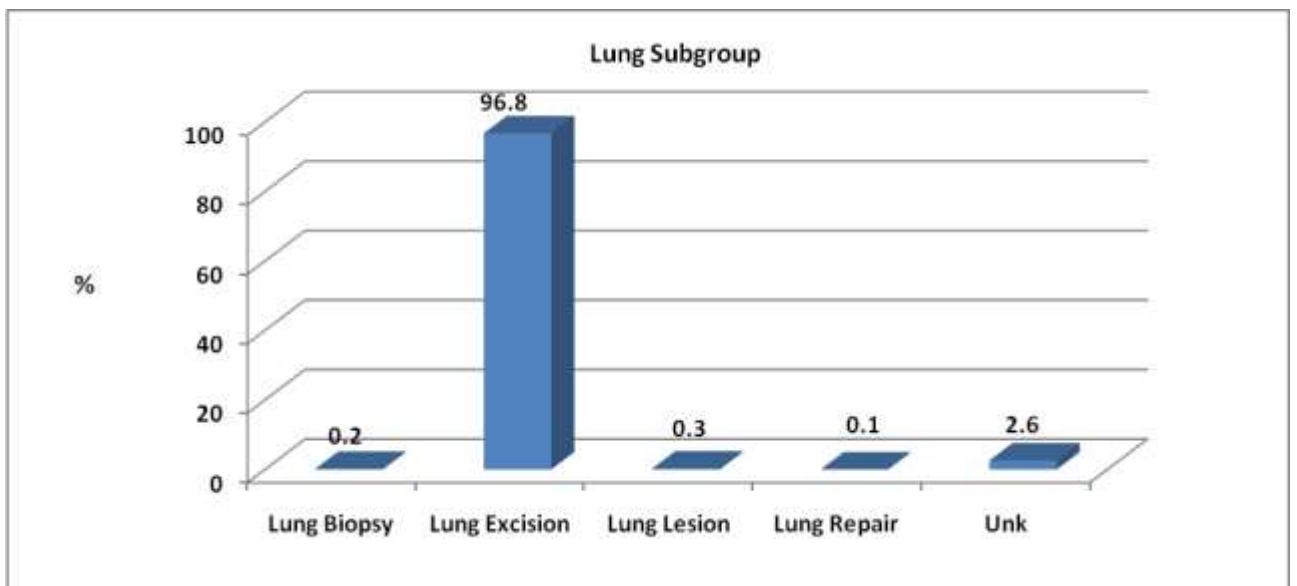
Demographics: gender

Gender	Occurrences	Percent
Male	812	48.8
Female	853	51.2
Total	1665	100



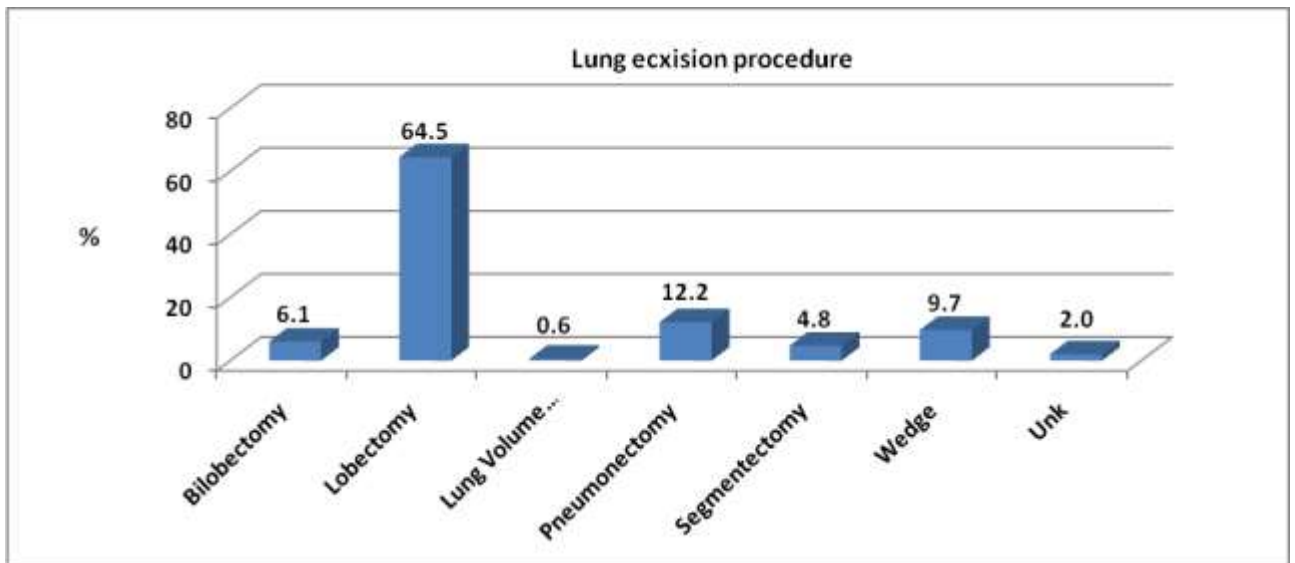
Lung Subgroup

Lungsubgroup	Occurrences	Percent
Lung Biopsy	4	0.2
Lung Excision	1612	96.8
Lung Lesion	5	0.3
Lung Repair	1	0.1
Unk	43	2.6
Total	1665	100



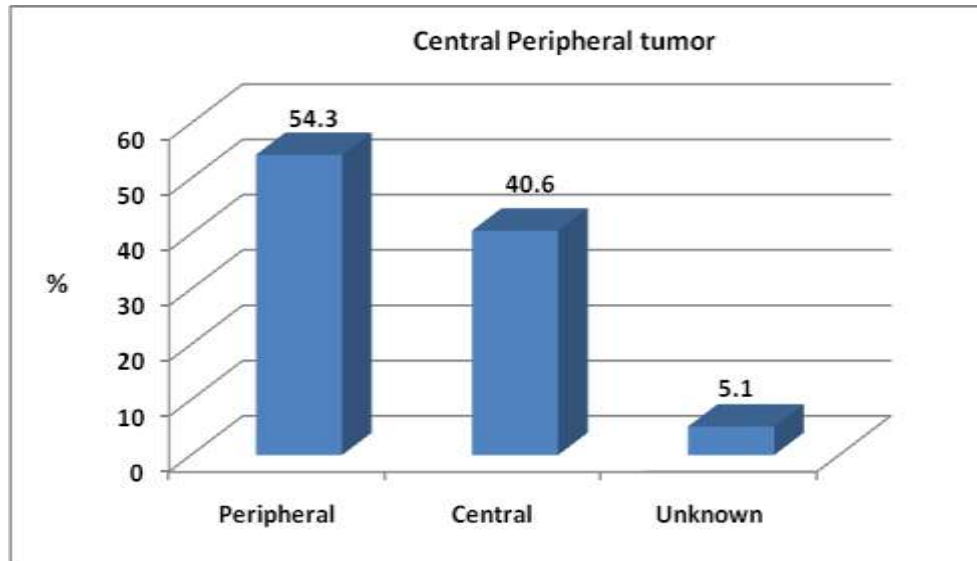
Lung Excision Procedure

Lung excision procedure	Occurrences	Percent
Bilobectomy	98	6.1
Lobectomy	1040	64.5
Lung Volume Reduction	10	0.6
Pneumonectomy	197	12.2
Segmentectomy	77	4.8
Wedge	157	9.7
Unk	33	2.0
Total	1612	100



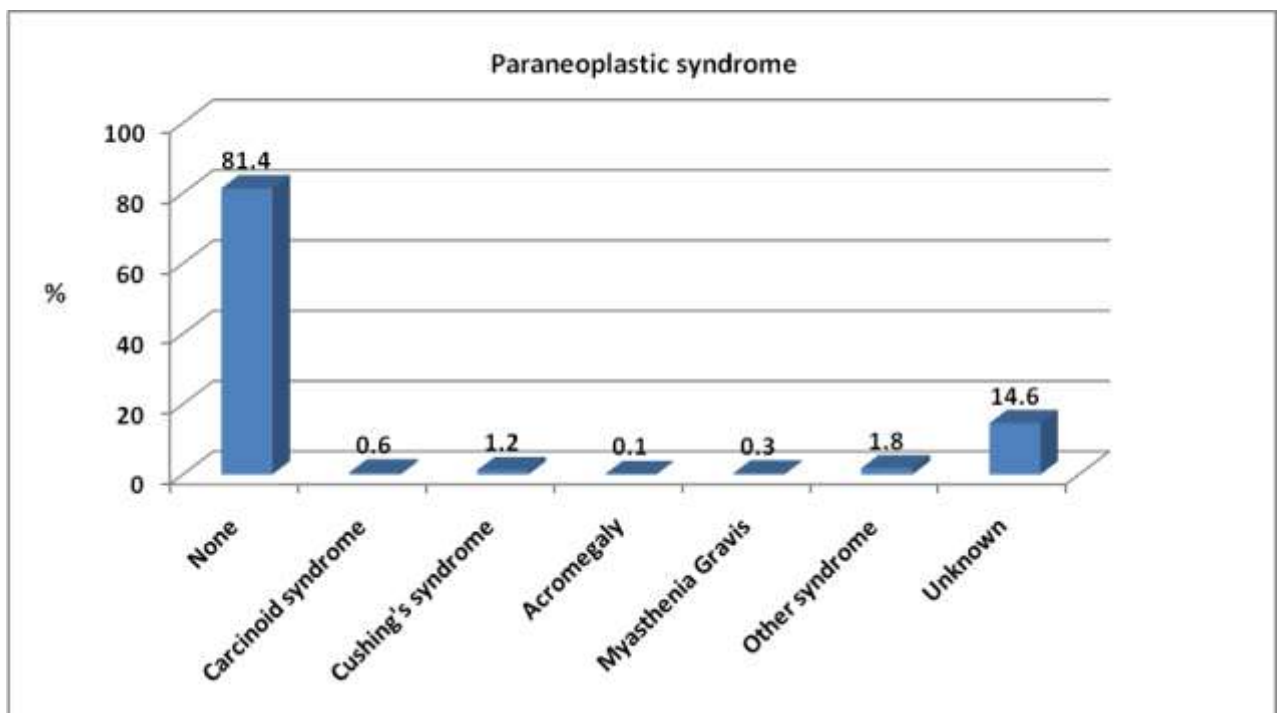
Centralperipheralumor

centralperipheralumor	Occurrences	Percent
Peripheral	875	54.3
Central	654	40.6
Unknown	83	5.1
Total	1612	100



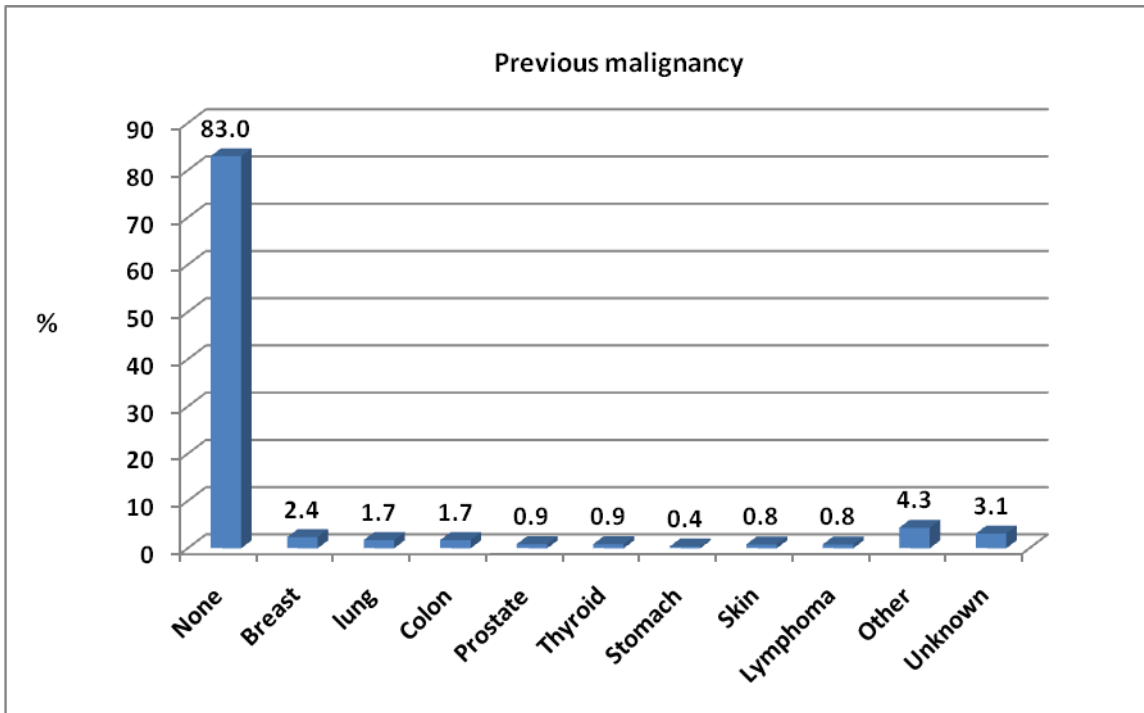
Paraneoplastic syndrome

paraneoplasticsyndrome	Occurrences	Percent
None	1312	81.4
Carcinoid syndrome	9	0.6
Cushing's syndrome	20	1.2
Acromegaly	2	0.1
Myasthenia Gravis	5	0.3
Other syndrome	29	1.8
Unknown	235	14.6
Total	1612	100



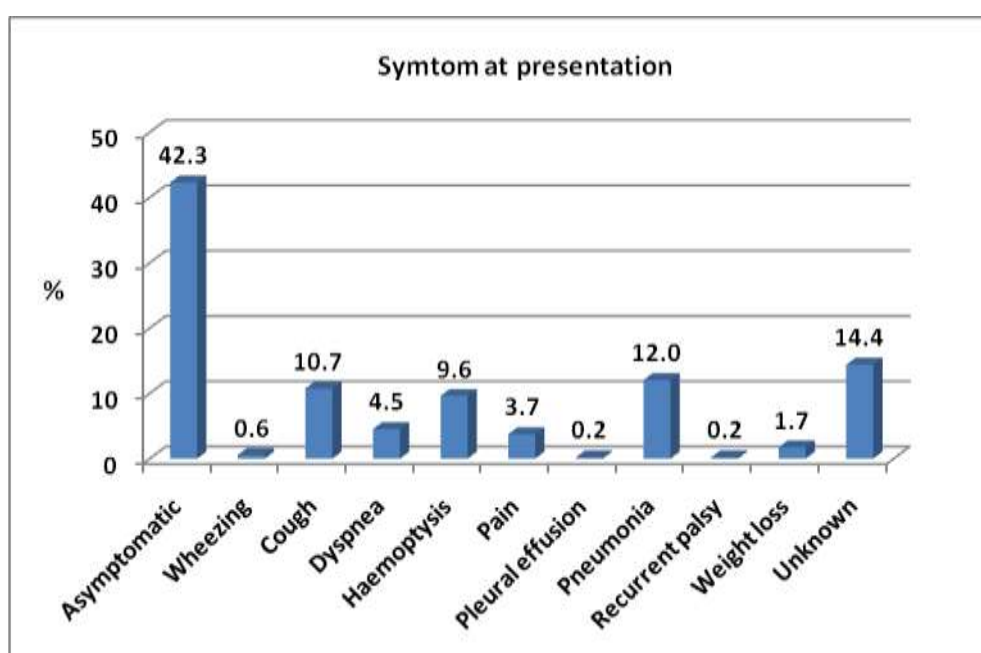
Previous Malignancy

previous malignancy	Occurrences	Percent
None	1338	83.0
Breast	38	2.4
lung	28	1.7
Colon	28	1.7
Prostate	14	0.9
Thyroid	14	0.9
Stomach	6	0.4
Skin	13	0.8
Lymphoma	13	0.8
Other	70	4.3
Unknown	50	3.1
Total	1612	100



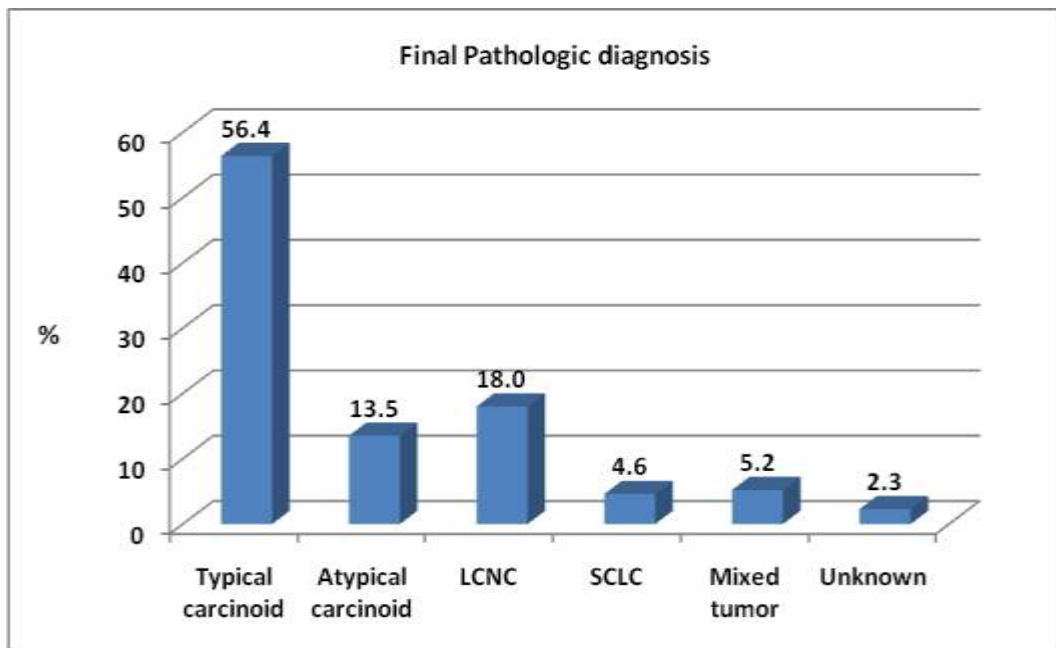
Symptom at presentation

symptomsatpresentation	Occurrences	Percent
Asymptomatic	N	%
Wheezing	682	42.3
Cough	9	0.6
Dyspnea	173	10.7
Haemoptysis	73	4.5
Pain	155	9.6
Pleural effusion	60	3.7
Pneumonia	3	0.2
Recurrent palsy	194	12.0
Weight loss	3	0.2
Unknown	28	1.7
Total	1612	100



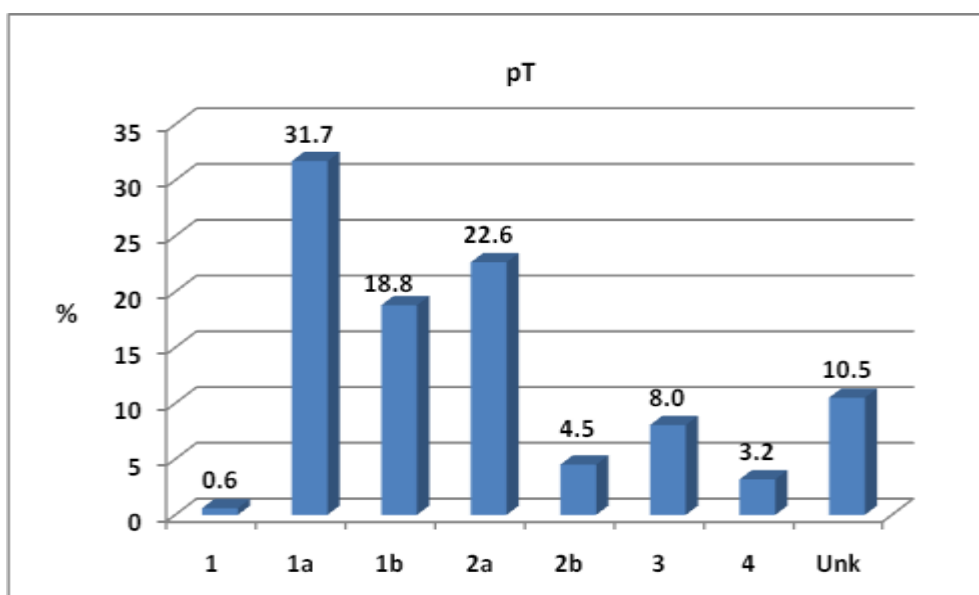
Final pathologic diagnosis

finalpathologicdiagnosis	Occurrences	Percent
Typical carcinoid	909	56.4
Atypical carcinoid	218	13.5
LCNC	290	18.0
SCLC	74	4.6
Mixed tumor	84	5.2
Unknown	37	2.3
Total	1612	100

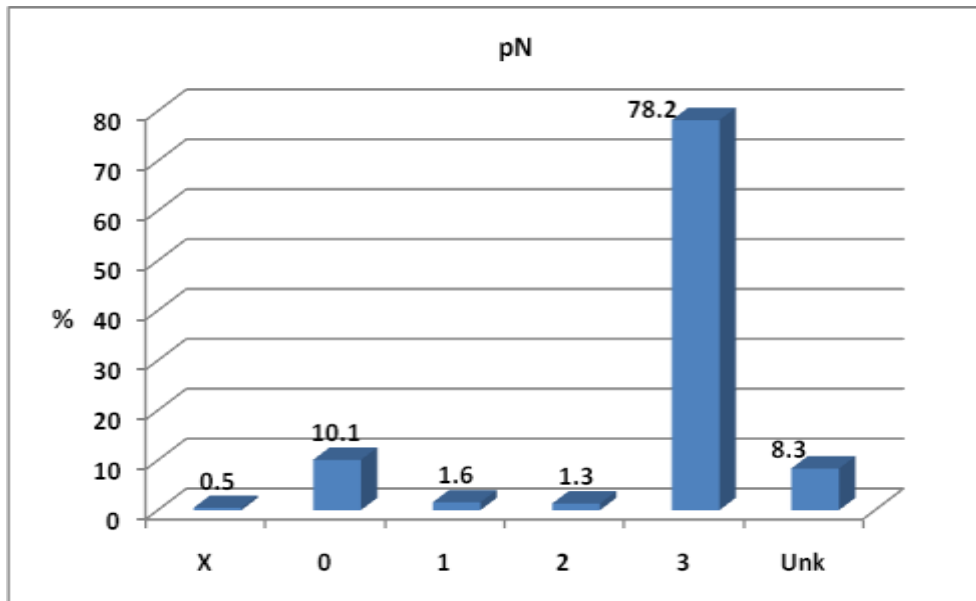


Pathological Staging (On all Lung Subgroup) : pT,pN,pM

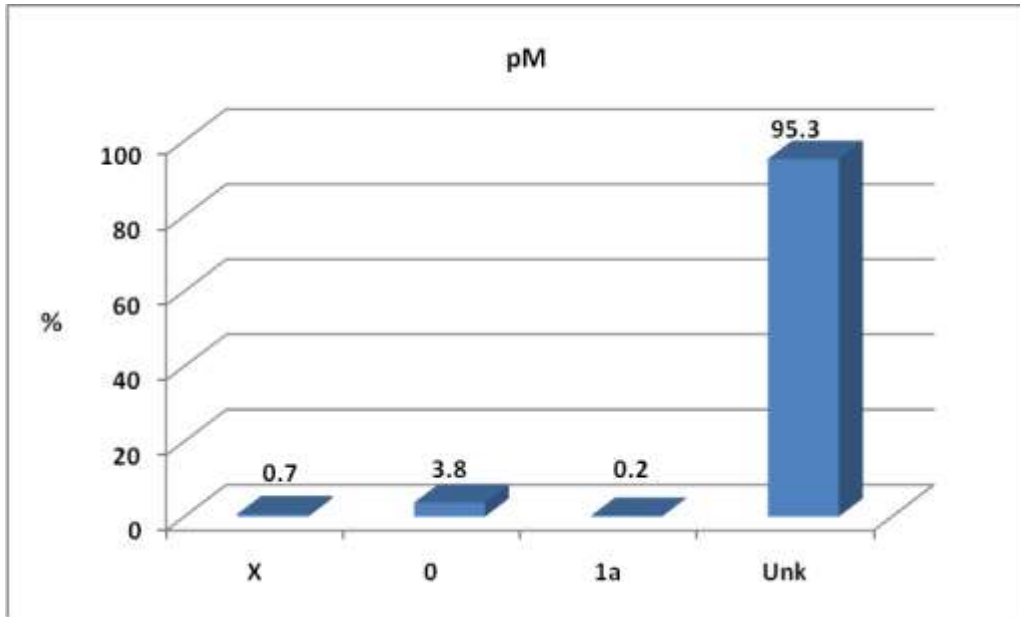
pT	Occurrences	Percent
1	10	0.6
1a	528	31.7
1b	313	18.8
2a	377	22.6
2b	75	4.5
3	134	8.0
4	53	3.2
Unk	175	10.5
Total	1665	100.0



pN	Occurrences	Percent
X	8	0.5
0	168	10.1
1	26	1.6
2	22	1.3
3	1302	78.2
Unk	139	8.3
Total	1665	100.0

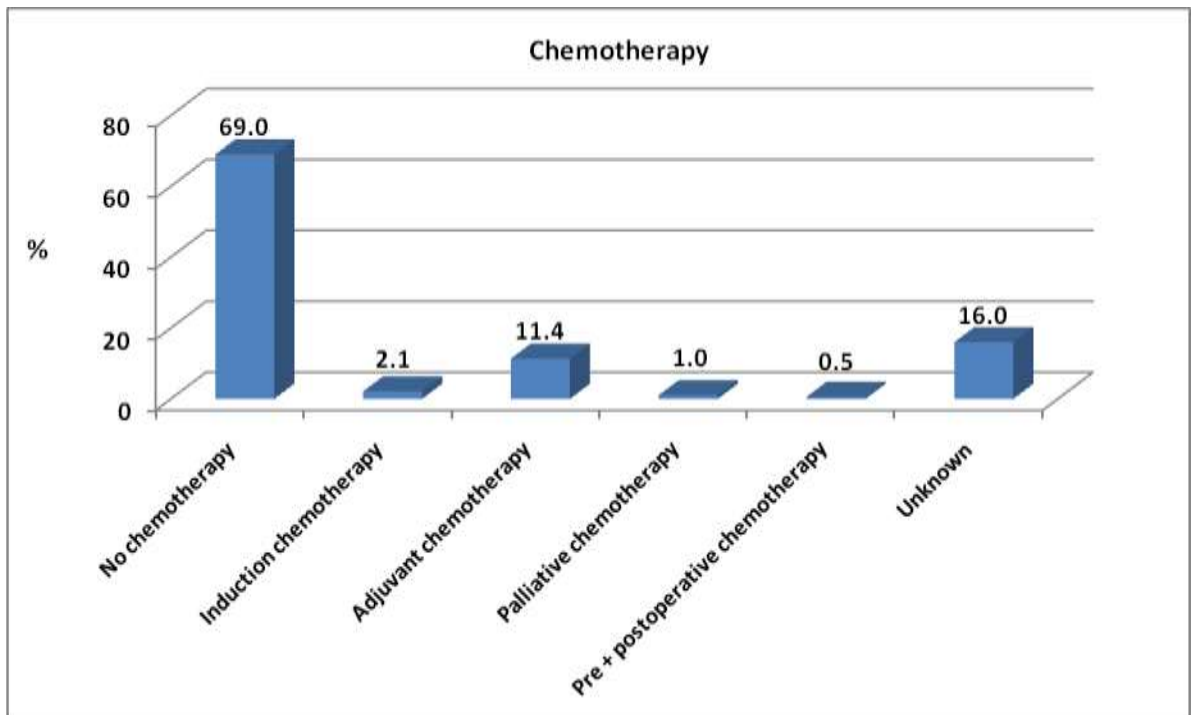


pM	Occurrences	Percent
X	12	0.7
0	63	3.8
1a	4	0.2
Unk	1586	95.3
Total	1665	100.0



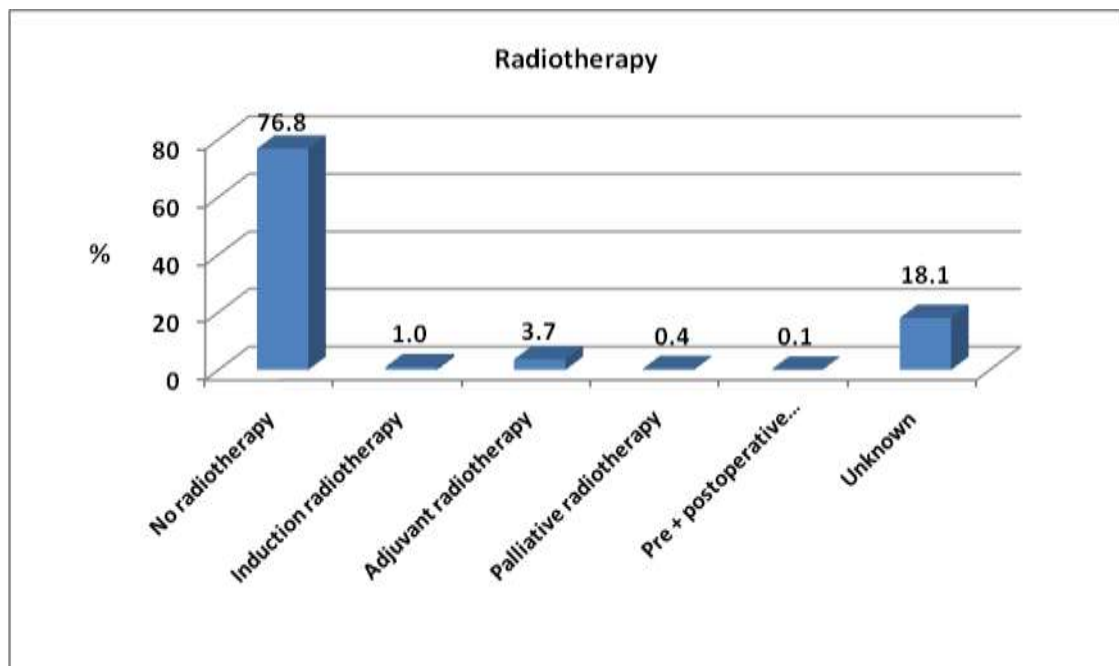
Chemotherapy

chemotherapy	Occurrences	Percent
No chemotherapy	1149	69.0
Induction chemotherapy	35	2.1
Adjuvant chemotherapy	189	11.4
Palliative chemotherapy	17	1.0
Pre + postoperative chemotherapy	9	0.5
Unknown	266	16.0
Total	1665	100



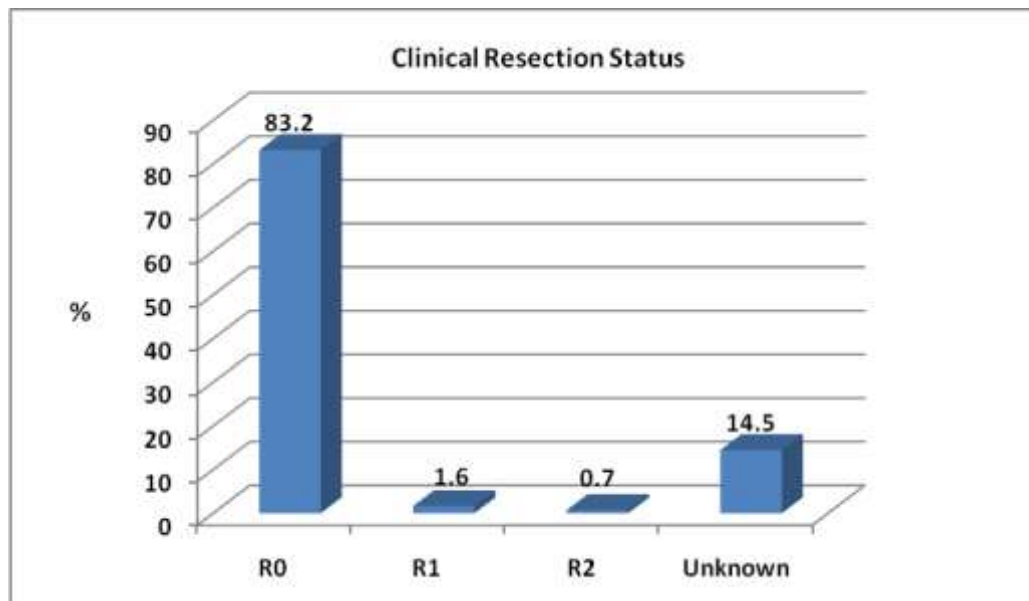
Radiotherapy

Radiotherapy	Occurrences	Percent
No radiotherapy	1279	76.8
Induction radiotherapy	17	1.0
Adjuvant radiotherapy	61	3.7
Palliative radiotherapy	6	0.4
Pre + postoperative radiotherapy	1	0.1
Unknown	301	18.1
Total	1665	100



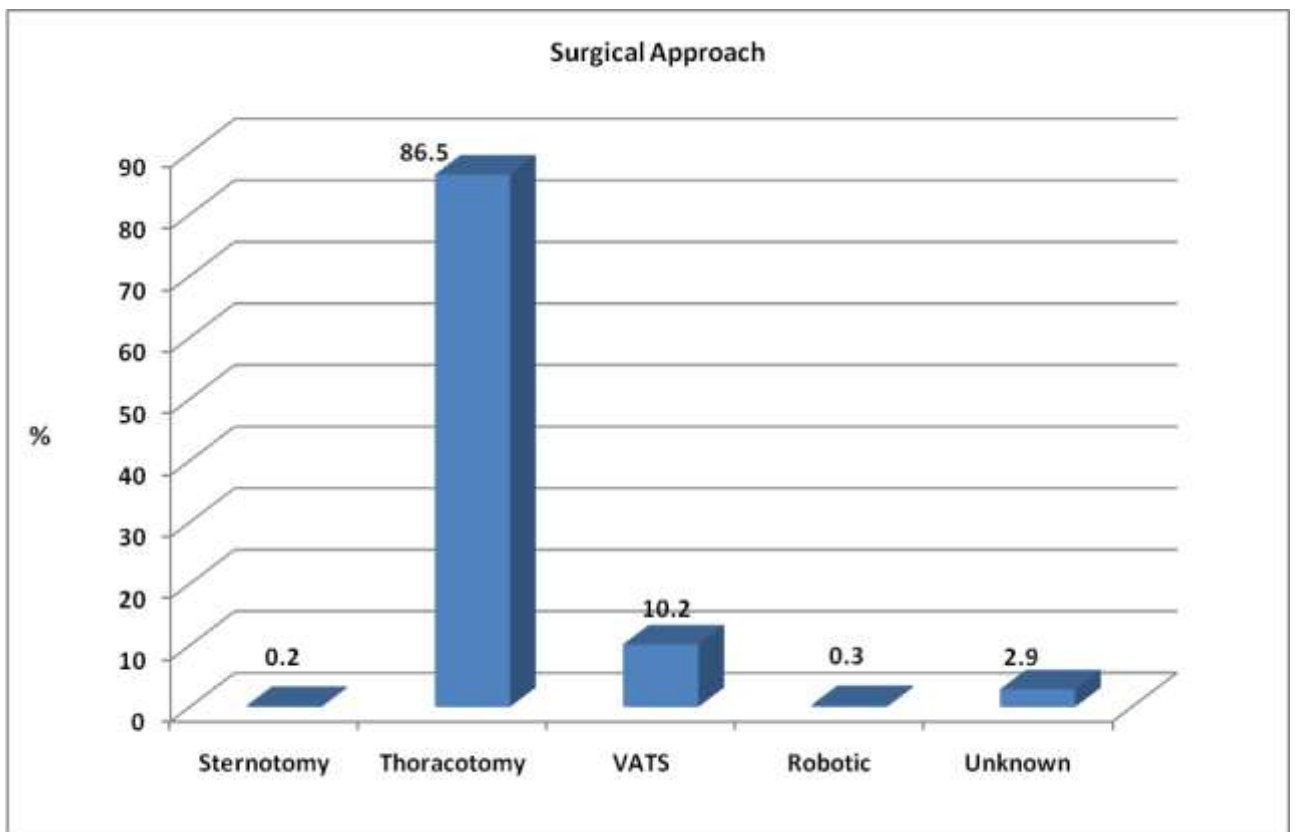
Clinical Resection Status

Clinical Resection Status	Occurrences	Percent
R0	1385	83.2
R1	27	1.6
R2	12	0.7
Unknown	241	14.5
Total	1665	100



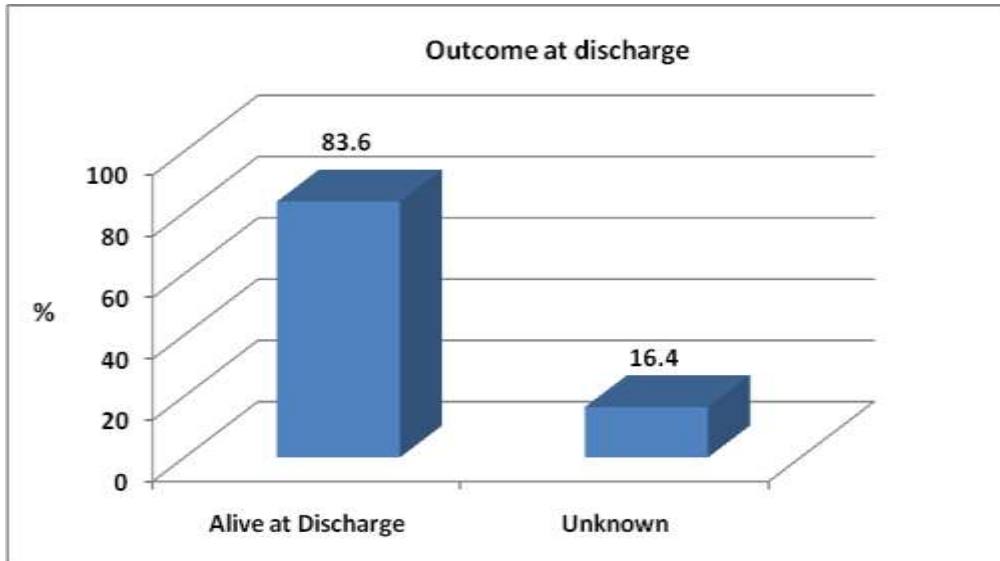
Surgical Approach

Surgical Approach	Occurrences	Percent
Sternotomy	3	0.2
Thoracotomy	1394	86.5
VATS	164	10.2
Robotic	5	0.3
Unknown	46	2.9
Total	1612	100



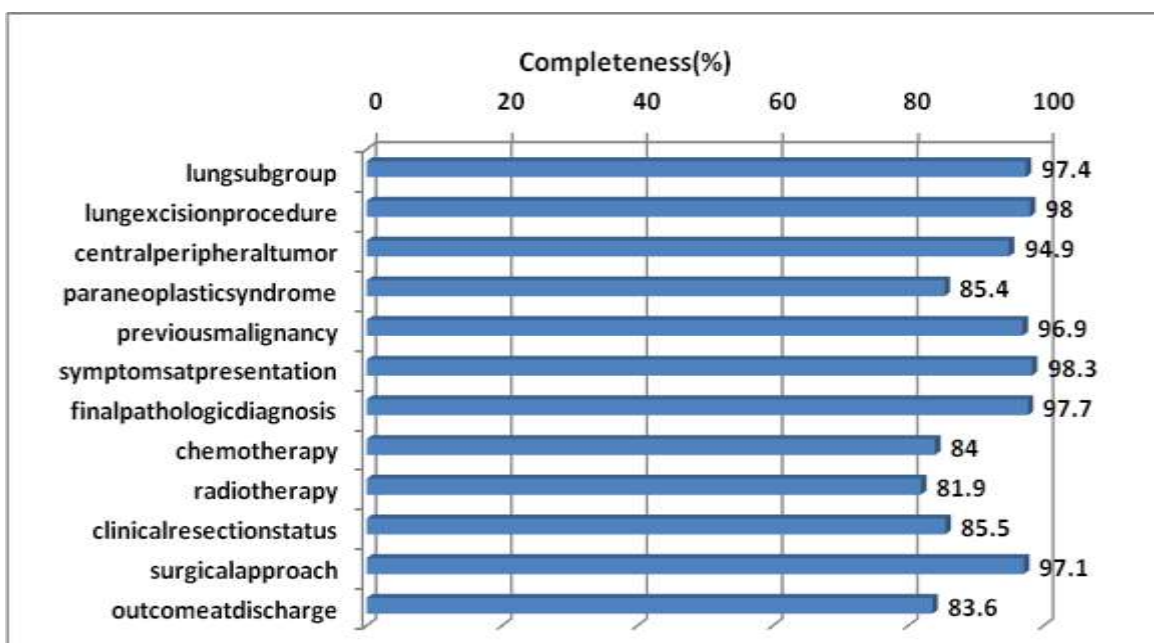
Outcome at discharge

Surgical Approach	Occurrences	Percent
Alive at Discharge	1347	83.6
Unknown	265	16.4
Total	1612	100



Data Completeness

Name of Field	Unknown (%)	Completeness(%)
lungsubgroup	2.6	97.4
lungexcisionprocedure	2	98
centralperipheraltumor	5.1	94.9
paraneoplasticsyndrome	14.6	85.4
previousmalignancy	3.1	96.9
symptomsatpresentation	1.7	98.3
finalpathologicdiagnosis	2.3	97.7
chemotherapy	16	84
radiotherapy	18.1	81.9
clinicalresectionstatus	14.5	85.5
surgicalapproach	2.9	97.1
outcomeatdischarge	16.4	83.6



PART 6

CHEST WALL SECTION (Database users only)

Message from Clinical Leader of ESTS RegistryChest Wall section

Dr Jose Ribas
Chair Chest Wall Database
jribas@usp.br



Dear Colleagues,

Thank you all for the opportunity to present some words, even in these last years where the world is upside down, due to the Covid-19 pandemic. Since October 30th, 2018, I was honoured to have being invited to join as Chair of the ESTS Chest Wall Working Group (CWWG). Since then, we started working to improve our dataset, as we had promised before.

As we mentioned before in our last silver book, together with Dra Leticia L. Lauricella, from Hospital das Clinicas, Sao Paulo, Brazil, in the last few months we've worked hard to propose some changes in the overall structure of the dataset, which was divided into three different branches:

1. congenital chest wall deformities
2. thoracic trauma
3. primary/secondary tumors.

Our goal was to make the chest wall more comprehensive and allow a more detailed and specific data collection for each pathology. It will now be offered for the approval of the ESTS board of directors and, after that, we are completely sure that with these amendments, we'll define the next steps for the forthcoming years.

Will be a pleasure to meet all you again in The Hague during our annual meeting.

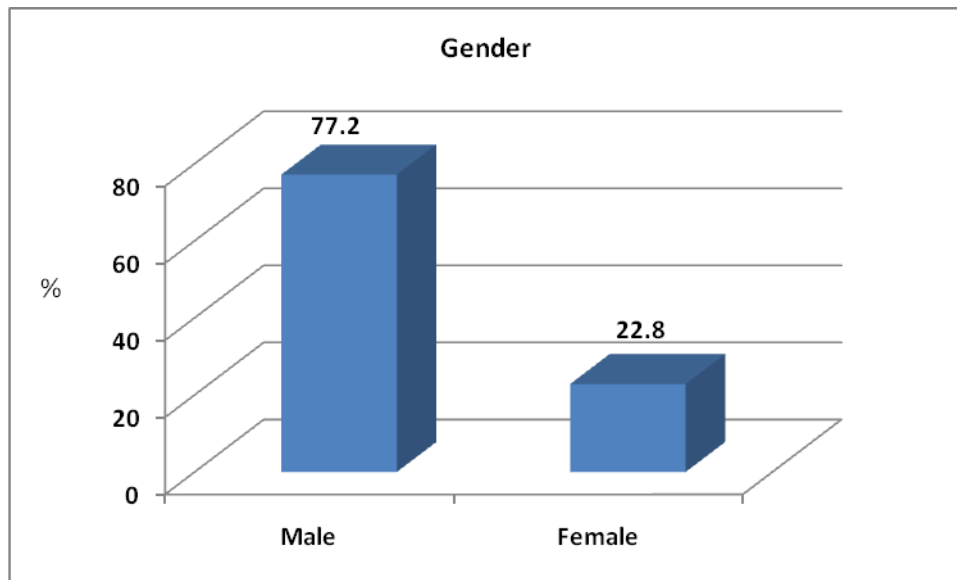
Prof. Dr. Jose Ribas M. de Campos
Chair of the Chest Wall Working Group – ESTS.

CHEST WALL Section fields

Group Definition Chest Wall
January 2003- December 2021
N=1472

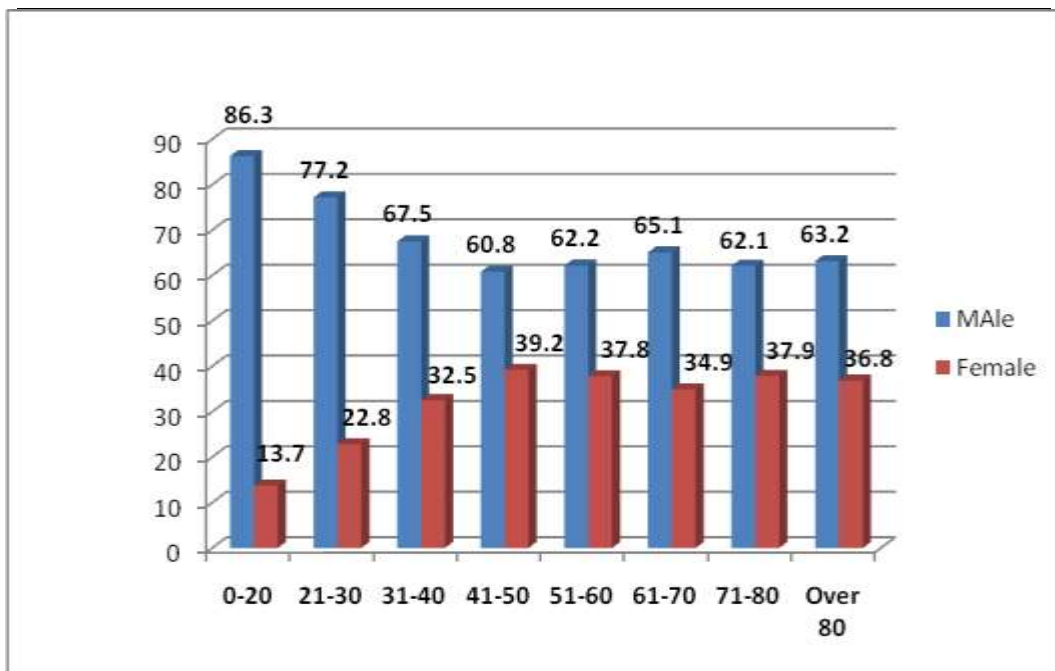
Demographics: gender

Gender	Occurrences	Percent
Male	1136	77.2
Female	336	22.8
Total	1472	100



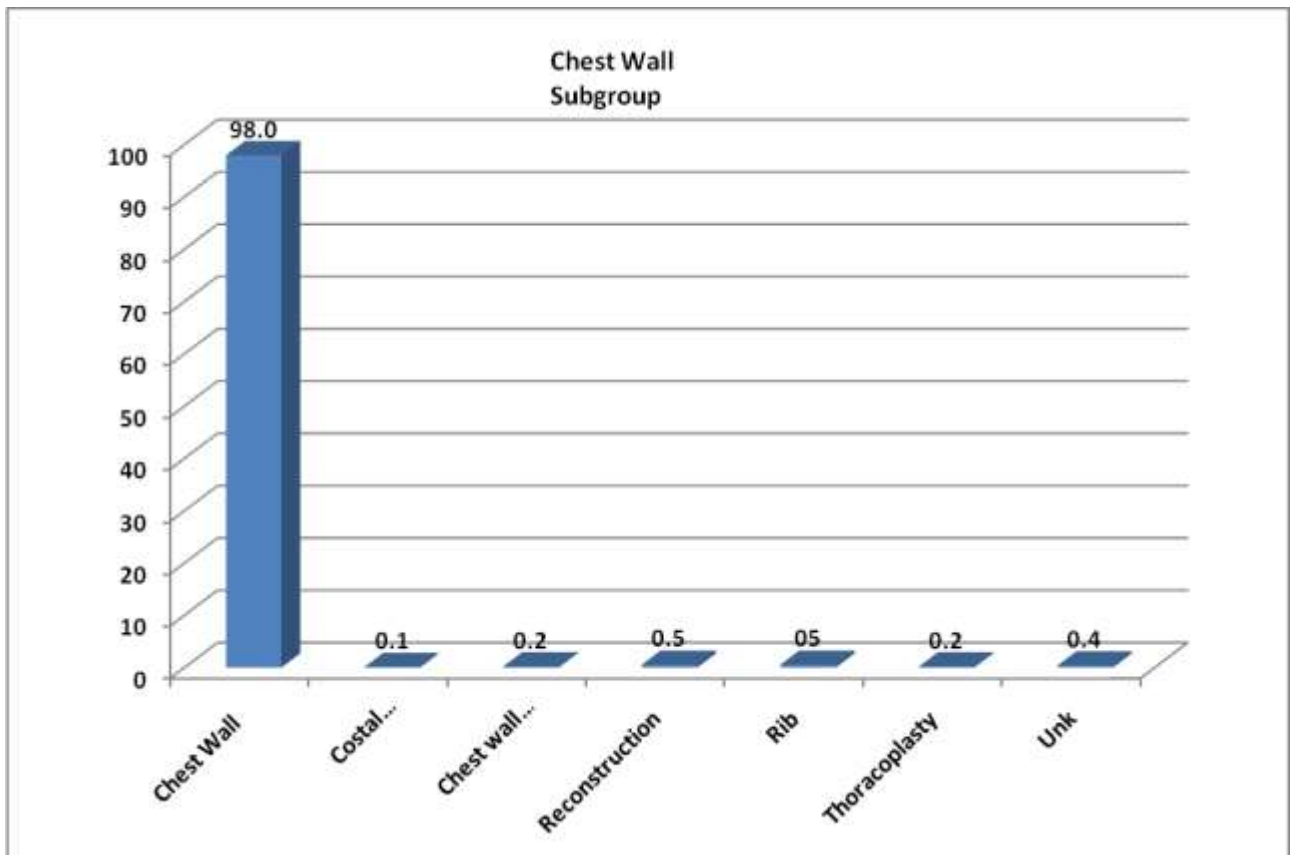
Age Group

Age Group	Male(%)	Female(%)
0-20	86.3	13.7
21-30	77.2	22.8
31-40	67.5	32.5
41-50	60.8	39.2
51-60	62.2	37.8
61-70	65.1	34.9
71-80	62.1	37.9
Over 80	63.2	36.8



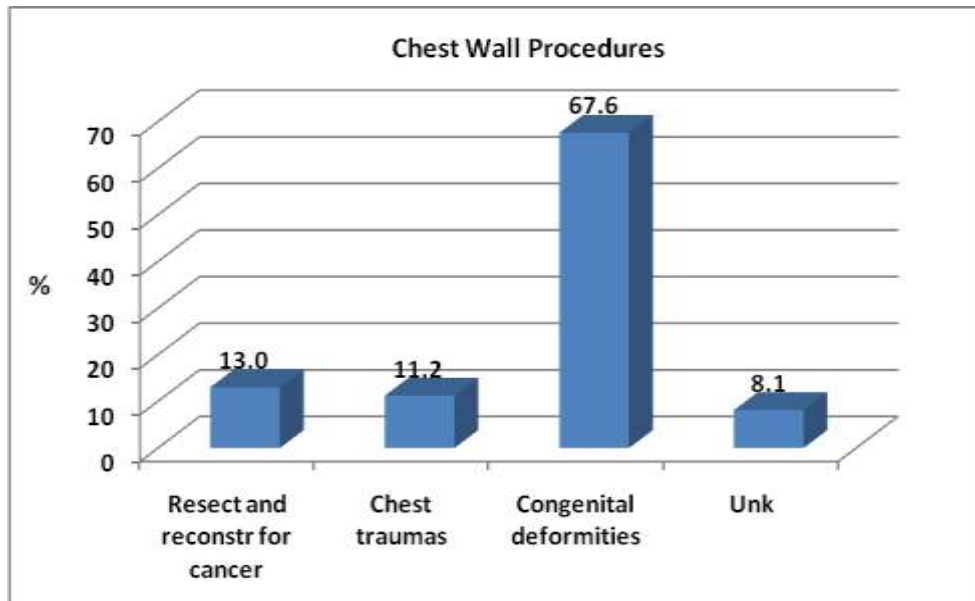
Chest Wall Subgroup

Chestwallsubgroup	Occurrences	Percent
Chest Wall (autosetting)	1442	98.0
Costal Cartilage	2	0.1
Chest wall Incision	3	0.2
Reconstruction	8	0.5
Rib	8	0.5
Thoracoplasty	3	0.2
Unk	6	0.4
Total	1472	100



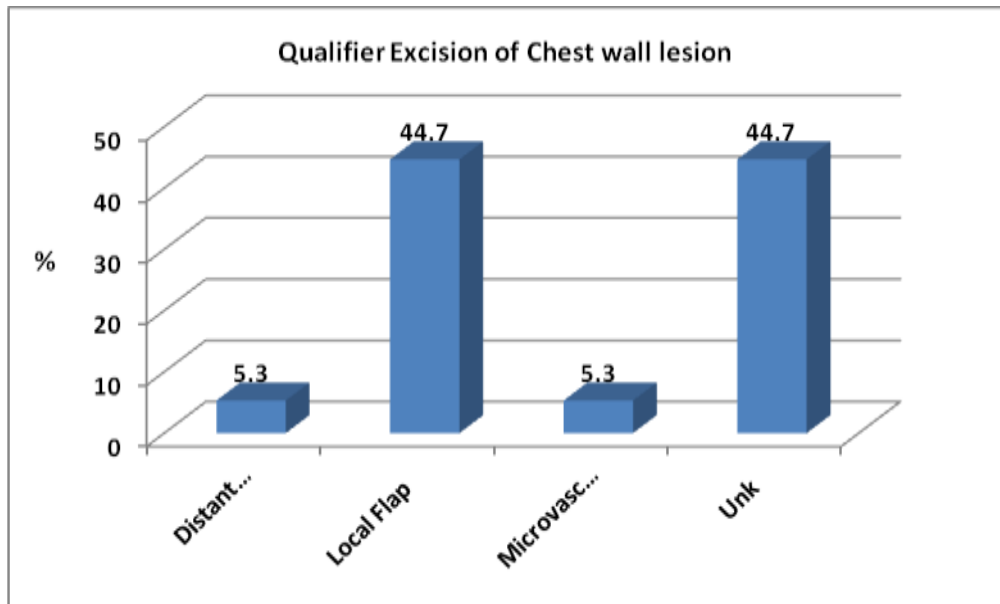
Chest Wall Procedures

Chest Wall procedures	Occurrences	Percent
Resect and reconstr for cancer	188	13.0
Chest traumas	162	11.2
Congenital deformities	975	67.6
Unk	117	8.1
Total	1472	100



On Group Resect and reconstr Cancer

qualifierexcisionofchestwalllesion	Occurrences	Percent
Distant Flap	10	5.3
Local Flap	84	44.7
Microvascular Transferred Flap	10	5.3
Unk	84	44.7
Total	188	100

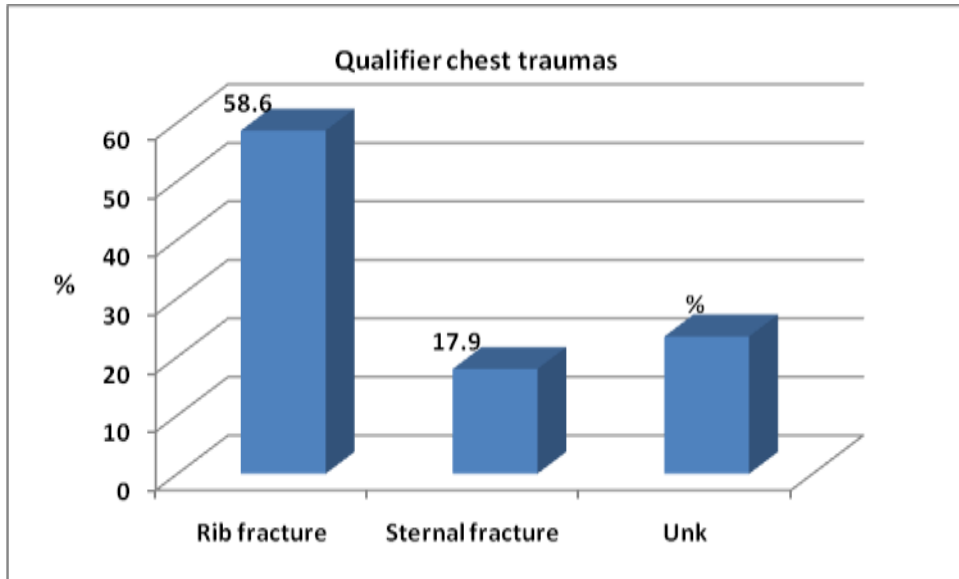


VATS

vats	Occurrences	Percent
No	166	88.3
Yes	13	6.9
Unk	9	4.8
Total	188	100

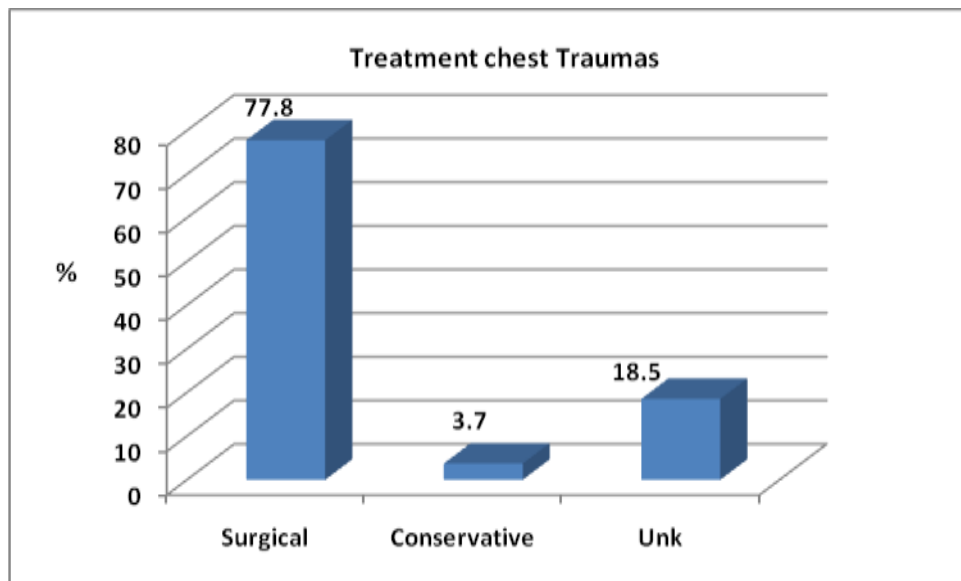
On Group Chest Traumas

qualfierchesttraumas	Occurrences	Percent
Rib fracture	95	58.6
Sternal fracture	29	17.9
Unk	38	23.5
Total	162	100



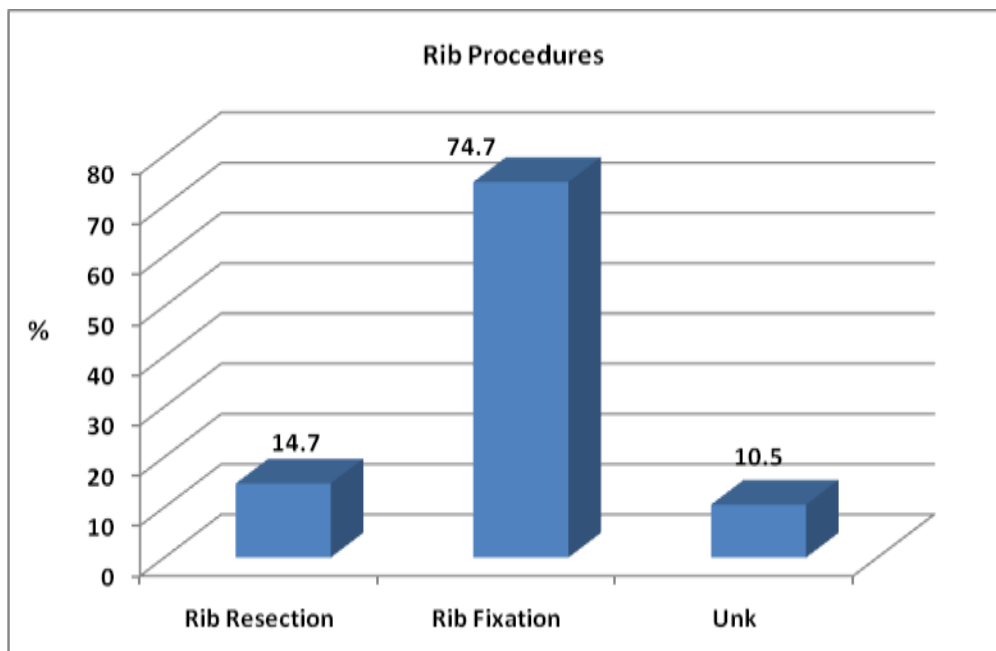
Treatment chest Traumas

Treatment chest traumas	Occurrences	Percent
Surgical	126	77.8
Conservative	6	3.7
Unk	30	18.5
Total	162	100



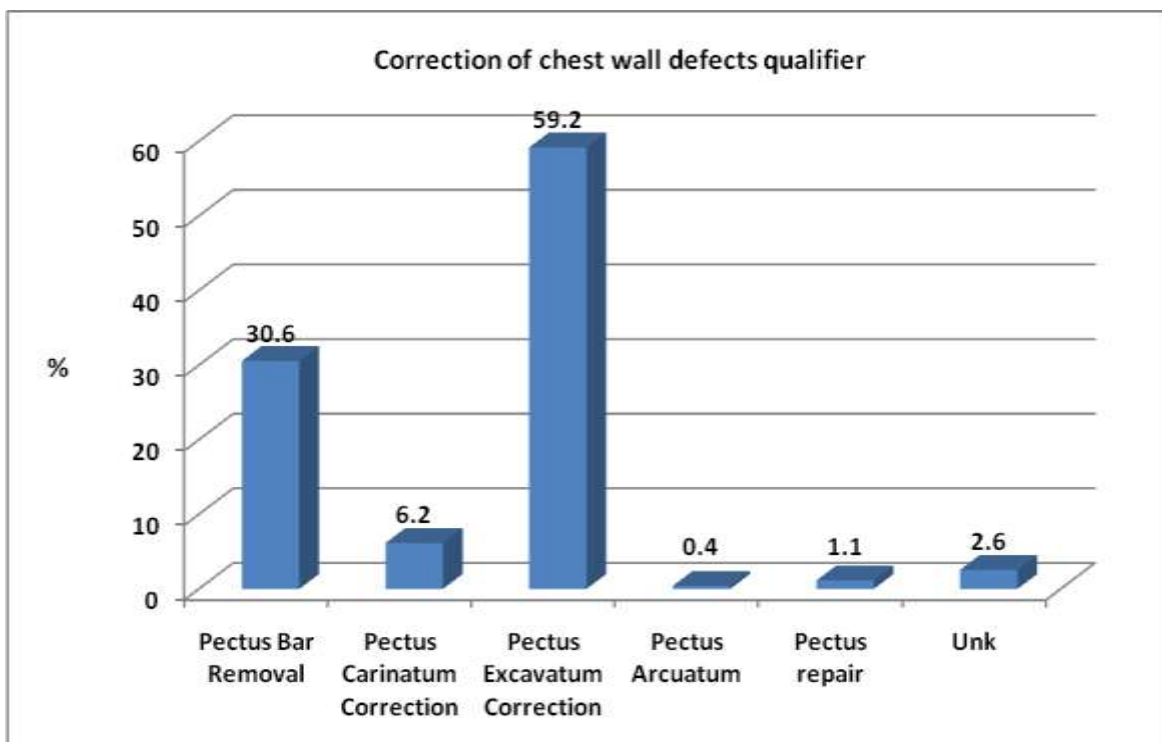
On Group Rib Fracture And Surgical

Rib procedures	Occurrences	Percent
Rib Resection	14	14.7
Rib Fixation	71	74.7
Unk	10	10.5
Total	95	100



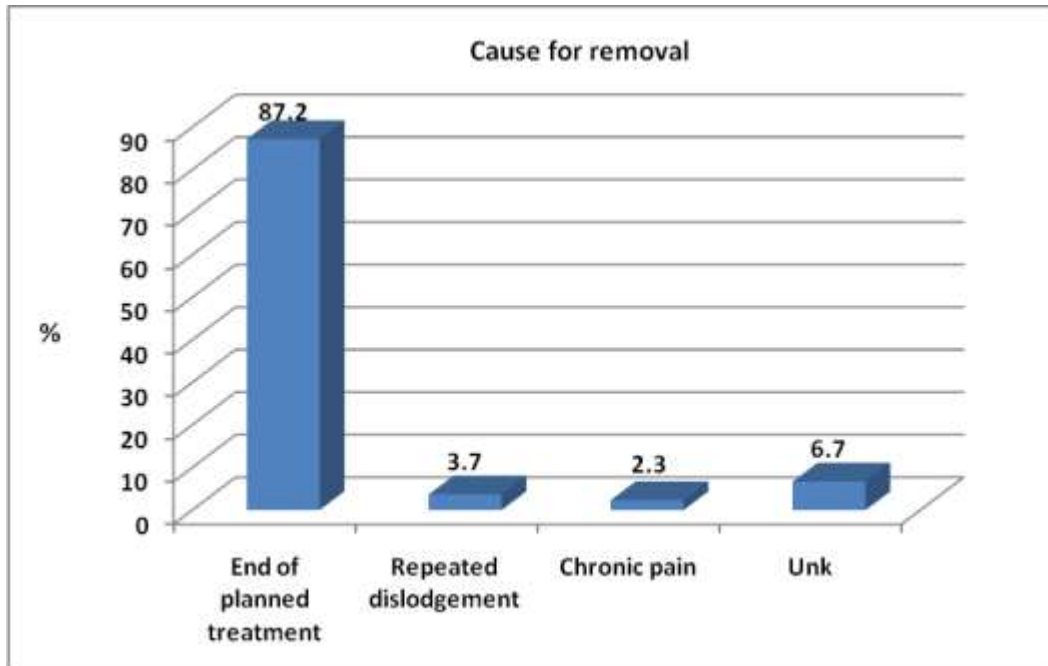
On Group Congenital deformities

Correction of chest wall defectsqualifier	Occurrences	Percent
Pectus Bar Removal	298	30.6
Pectus Carinatum Correction	60	6.2
Pectus Excavatum Correction	577	59.2
Pectus Arcuatum	4	0.4
Pectus repair	11	1.1
Unk	25	2.6
Total	975	100.0



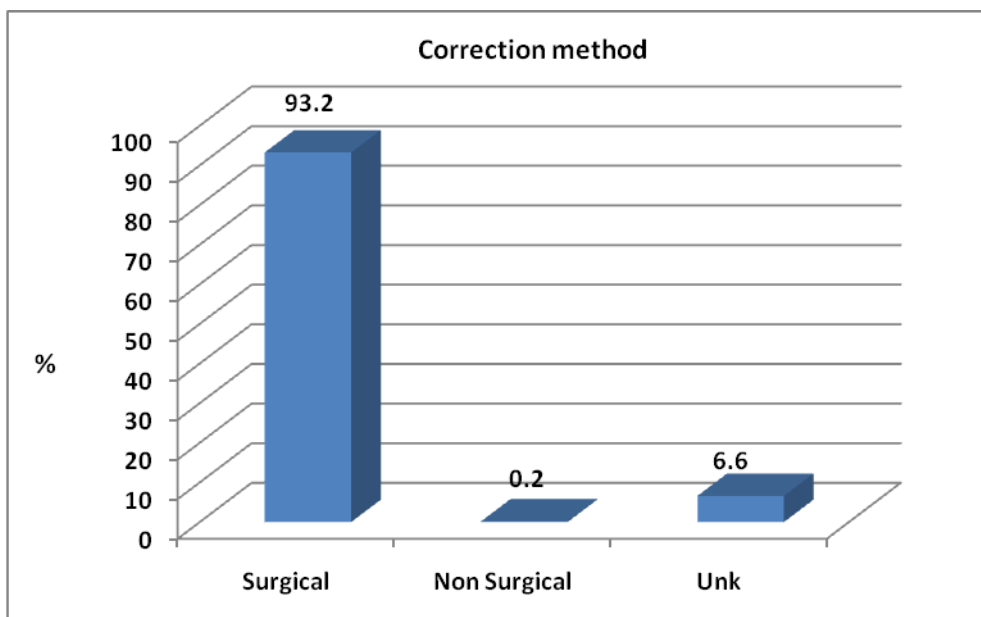
On Group Pectus Bar Removal

Cause for removal	Occurrences	Percent
End of planned treatment	260	87.2
Repeated dislodgement	11	3.7
Chronic pain	7	2.3
Unk	20	6.7
Total	298	100.0



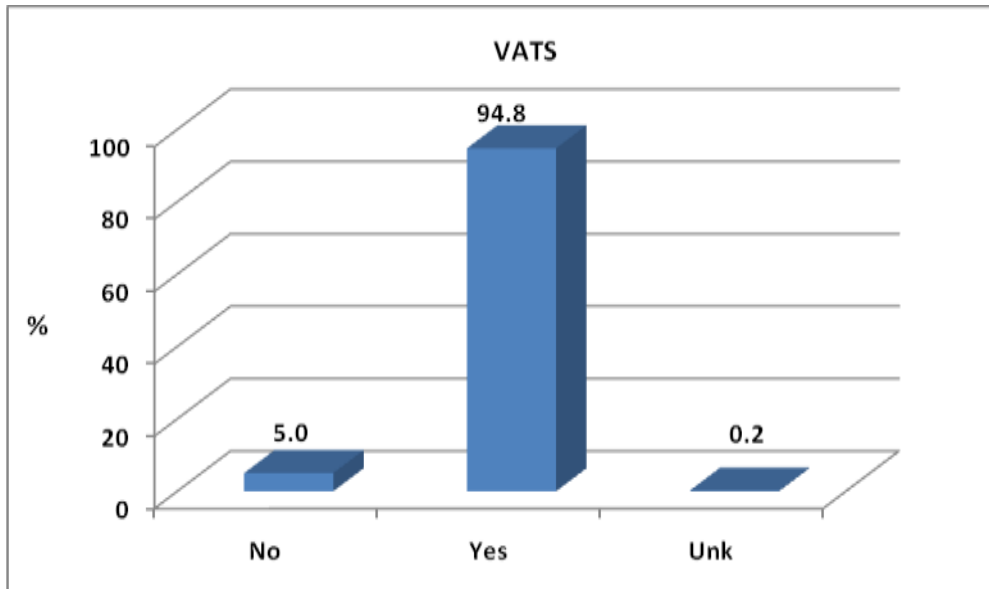
On Group Pectus Excavatum Correction

Correction method	Occurrences	Percent
Surgical	538	93.2
Non Surgical	1	0.2
Unk	38	6.6
Total	577	100



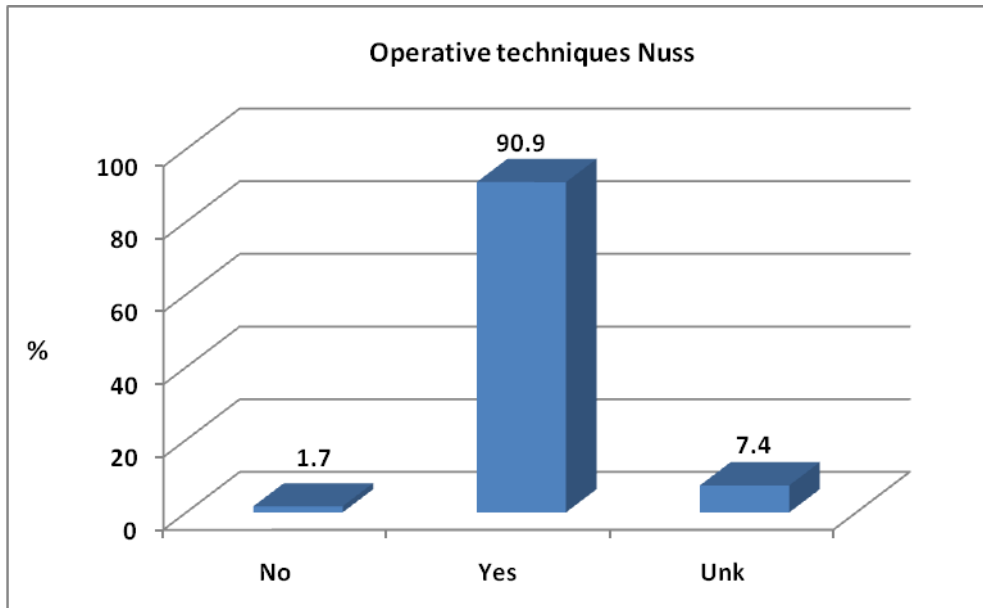
VATS

vats	Occurrences	Percent
No	27	5.0
Yes	510	94.8
Unk	1	0.2
Total	538	100



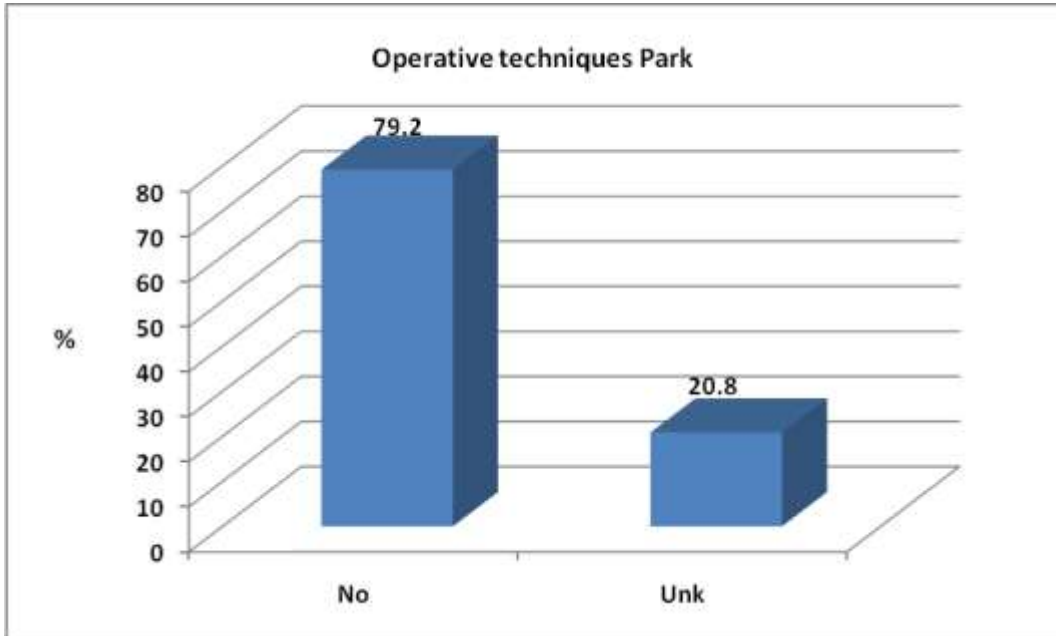
Operative technique Nuss

Operative techniques Nuss	Occurrences	Percent
No	9	1.7
Yes	489	90.9
Unk	40	7.4
Total	538	100



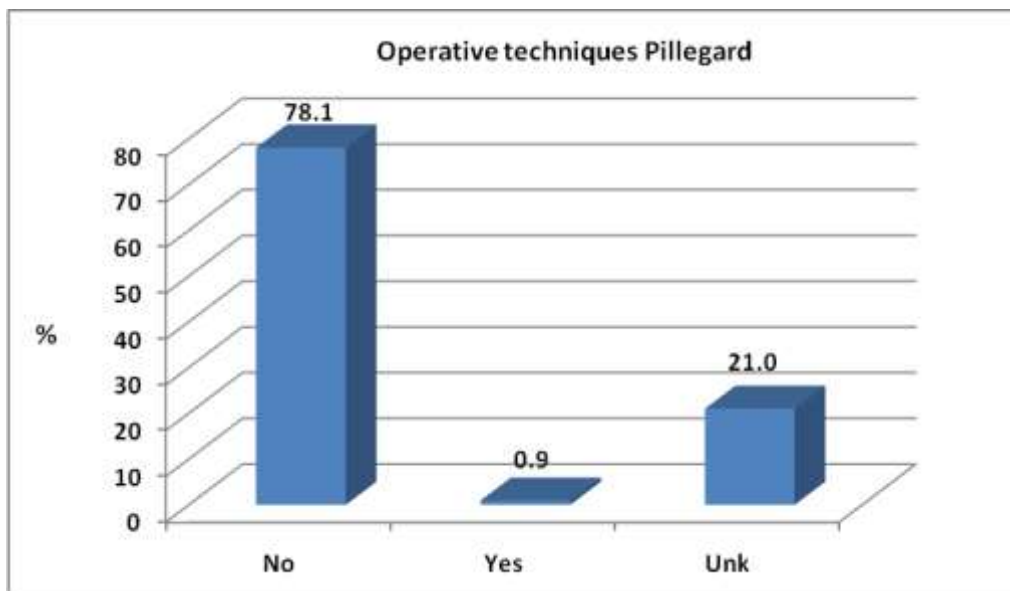
Operative Technique Park

Operative technique Park	Occurrences	Percent
No	426	79.2
Unk	112	20.8
Total	538	100



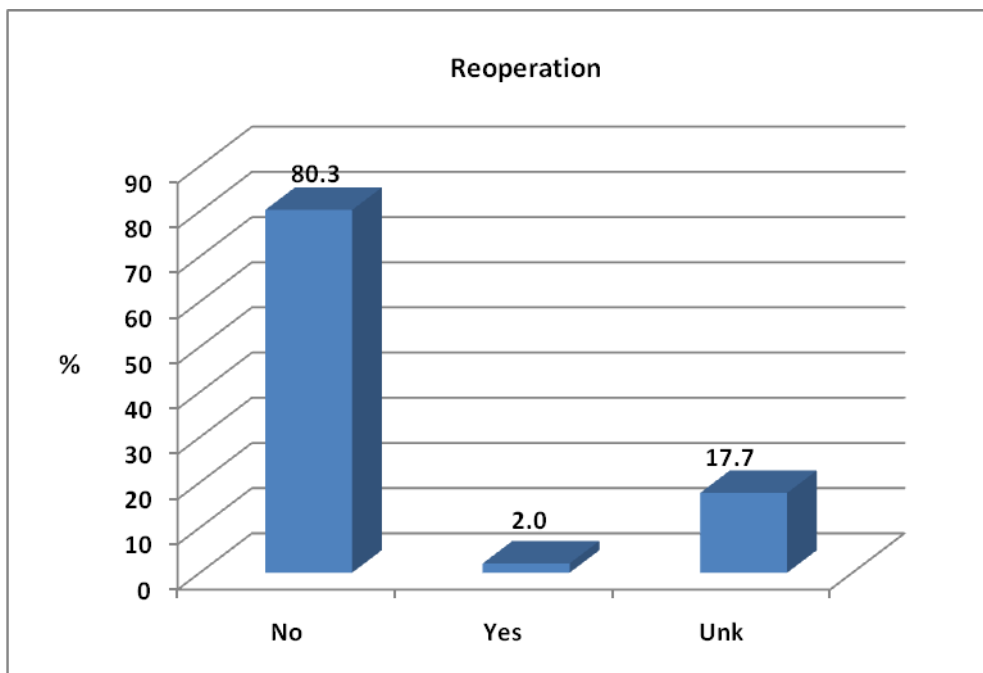
Operative Technique Pillegard

Operative technique Pillegard	Occurrences	Percent
No	420	78.1
Yes	5	0.9
Unk	113	21.0
Total	538	100



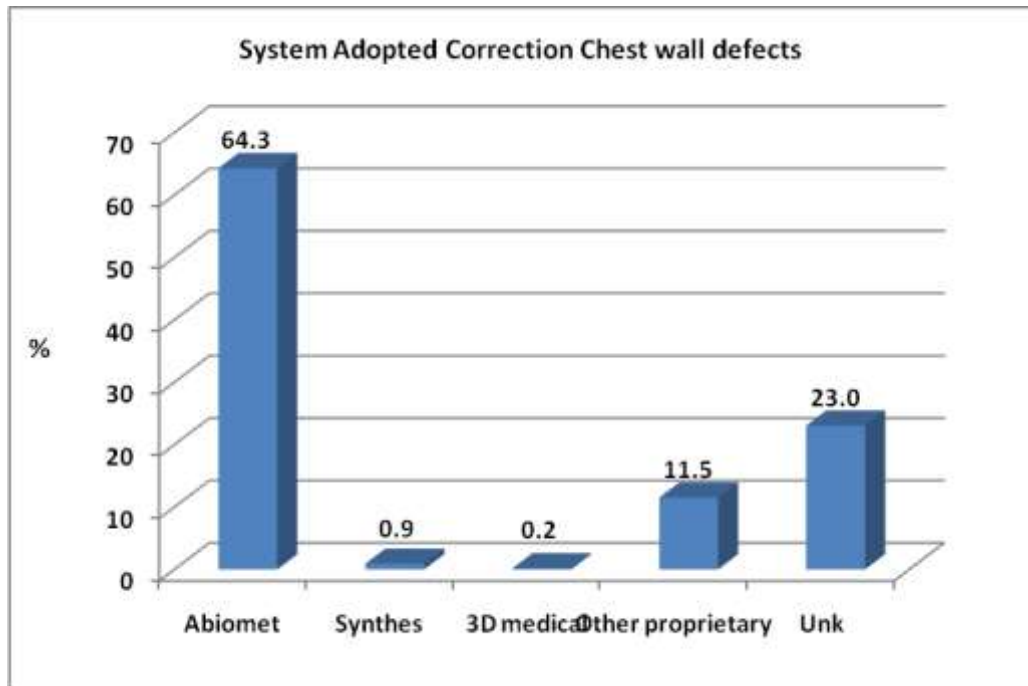
Reoperation

Reoperation	Occurrences	Percent
No	432	80.3
Yes	11	2.0
Unk	95	17.7
Total	538	100



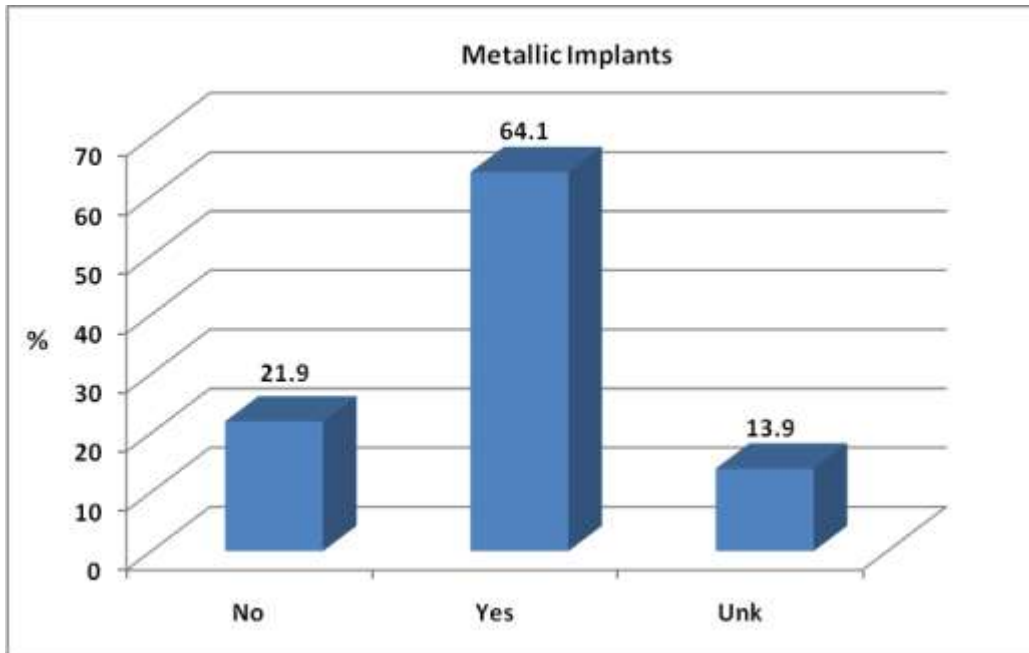
System Adopted Correction chest wall defects

systemadoptedcorrectioncwaldefects	Occurrences	Percent
Abiomet	346	64.3
Synthes	5	0.9
3D medical	1	0.2
Other proprietary	62	11.5
Unk	124	23.0
Total	538	100



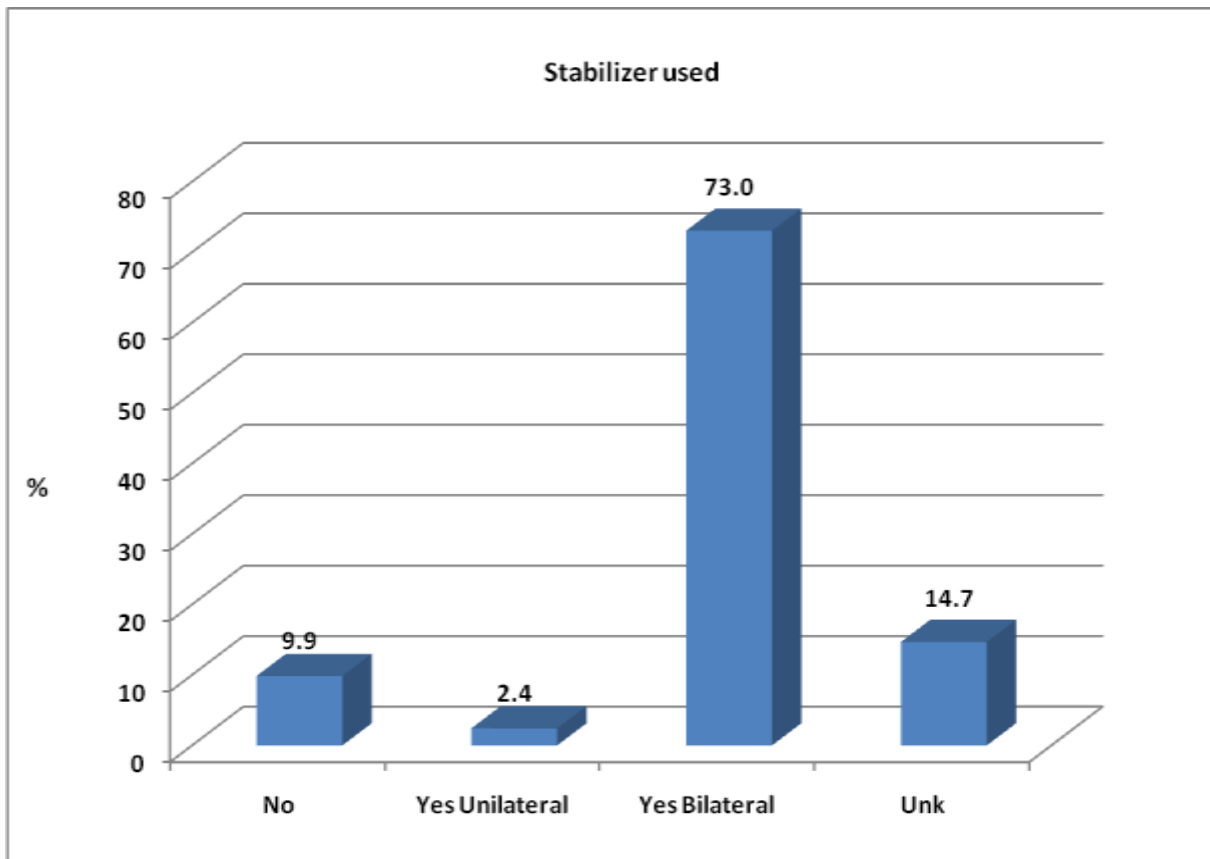
Metallic Implants

Metallic implants	Occurrences	Percent
No	118	21.9
Yes	345	64.1
Unk	75	13.9
Total	538	100



Stabilizer used

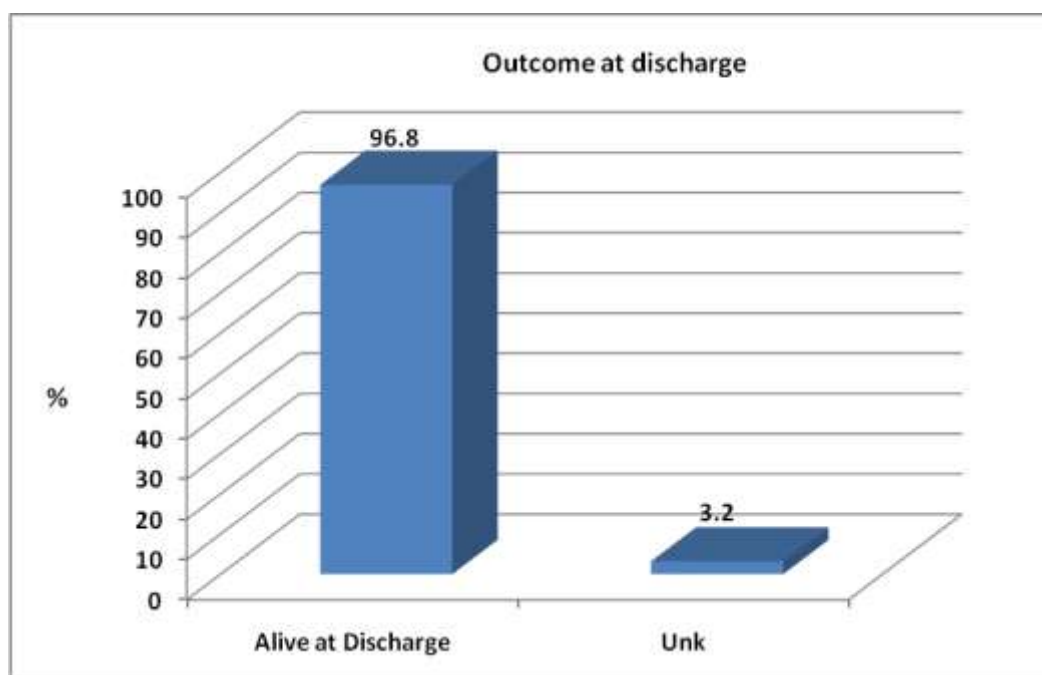
Stabilizer used	Occurrences	Percent
No	53	9.9
Yes Unilateral	13	2.4
Yes Bilateral	393	73.0
Unk	79	14.7
Total	538	100



Outcome at discharge (On Group Pectus Excavatum Correction - Surgical)

Outcome at discharge	Occurrences	Percent
Alive at Discharge [°]	521	96.8
Unk	17	3.2
Total	538	100

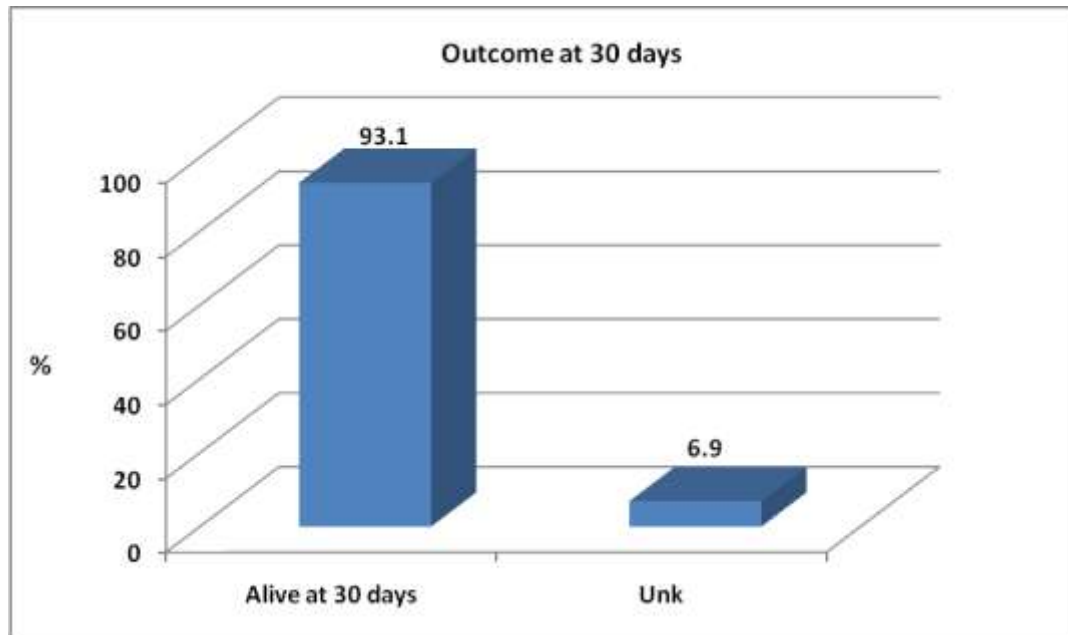
(°): Units with less than 500 patients included, results must be interpreted with caution



Outcome at 30 days (On Group Pectus Excavatum Correction - Surgical)

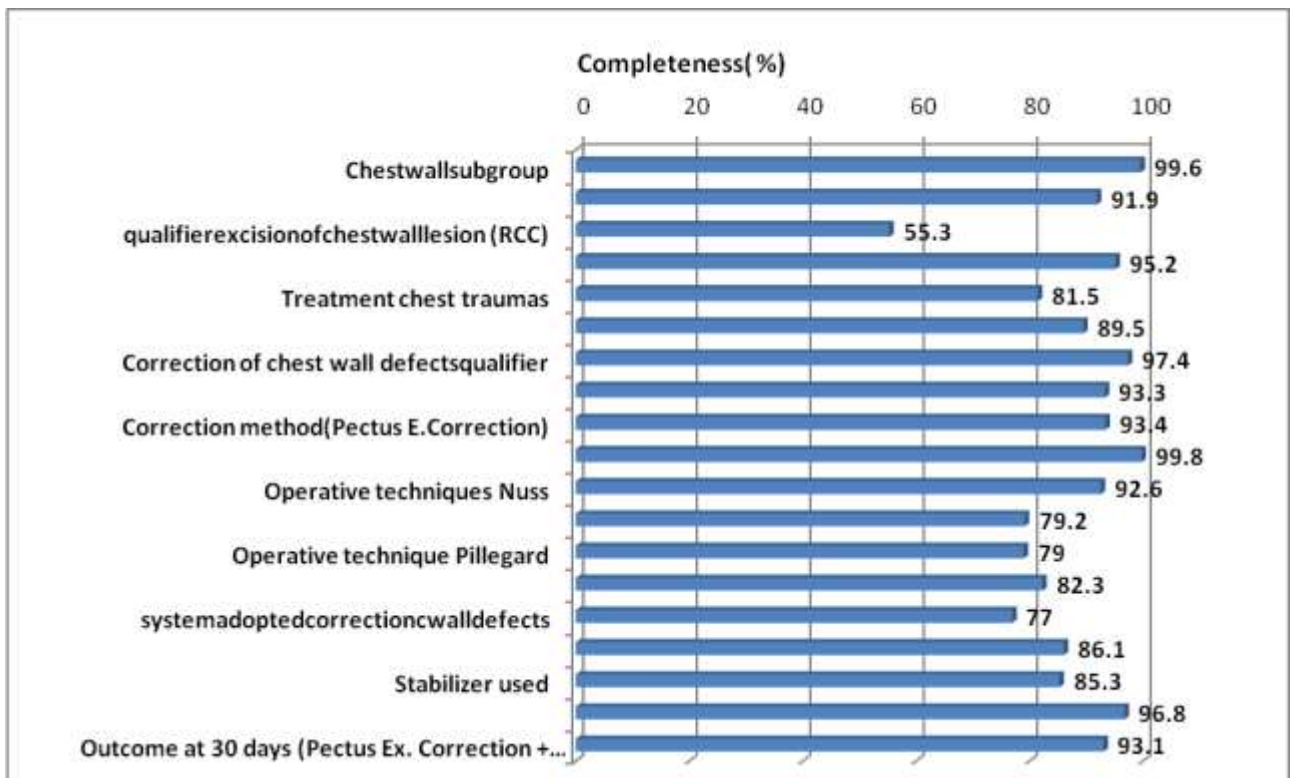
Outcome at 30 days	Occurrences	Percent
Alive at 30 days [°]	501	93.1
Unk	37	6.9
Total	538	100

(°): Units with less than 500 patients included, results must be interpreted with caution



Data Completeness

Name of Field	Unknown (%)	Completeness(%)
Chestwallsubgroup	0.4	99.6
Chest Wall procedures	8.1	91.9
qualifierexcisionofchestwalllesion (RCC)	44.7	55.3
vats (RCC)	4.8	95.2
Treatment chest traumas	18.5	81.5
Rib procedures (RF + Surgical)	10.5	89.5
Correction of chest wall defectsqualifier	2.6	97.4
Cause for removal(Pectus B.Removal)	6.7	93.3
Correction method(Pectus E.Correction)	6.6	93.4
vats (Pectus E.Correction + Surgical)	0.2	99.8
Operative techniques Nuss	7.4	92.6
Operative technique Park	20.8	79.2
Operative technique Pillegard	21	79
Reoperation	17.7	82.3
systemadoptedcorrectioncwaldefects	23	77
Metallic implants	13.9	86.1
Stabilizer used	14.7	85.3
Outcome at discharge (Pectus Ex. Correction + surgical)	3.2	96.8
Outcome at 30 days (Pectus Ex. Correction + surgical)	6.9	93.1



PART 7

AIRWAY SECTION (Database users only)

Message from Clinical Leader of ESTS AIRWAY section



Konrad Hoetzenecker, MD PhD
Professor for Lung Transplantation
Medical University of Vienna
konrad.hoetzenecker@meduniwien.ac.at

I am proud to be able to present a first report from the newly developed airway section of the ESTS database. The so called AIR (Airways Registry) project is a joint initiative of the ESTS and the Brazilian Society of Thoracic Surgery (BSTS). These two societies look back on a long-standing cooperation in the field of airway surgery. The idea of an own airway section within the ESTS database was first discussed in 2018 based on an unmet need for a high quality, well-maintained, multi-institutional database in airway surgery. A steering committee was formed including ESTS members (M Salati, W Klepetko, K Hoetzenecker) as well as members of BSTS (R Terra, B Bibas, P Cardoso). Subsequently, a completely new section within the ESTS database was created.

It was decided that AIR should serve mainly as a scientific database rather than a quality assurance tool. Therefore, it needed to be as detailed as possible and include preoperative examinations, intraoperative parameters, patient follow-up and functional outcome.

In order to assure the highest possible standard from the beginning, the steering committee decided to initially roll out AIR only at centers renowned for their expertise in airway surgery and with an annual case load of over 20 cases per year. After this initial roll out phase, the airway database will be opened for all other centers contributing to the ESTS database.

AIR finally went live on 01/01/2020 including the following sites: Medical University of Vienna (local coordinator: T Schweiger), Sapienza Università di Roma (local coordinator: E Rendina), Ruhrländisches Klinikum Essen (local coordinator C Aigner) Radboud University Medical Center Nijmegen (local coordinator: A Verhagen) and University of São Paulo (local coordinator: B Bibas). As by June 2022 more than 400 surgical airway cases had been put in the database capturing over 200 parameters per case.

AIR is the first comprehensive multi-institutional database world-wide, covering the full spectrum of airway surgery. I am confident that it will facilitate large-scale analysis with a unique data granularity and become an important contributor to the scientific field of airway surgery.

Konrad Hoetzenecker, MD PhD

Professor for Lung Transplantation

Medical University of Vienna

konrad.hoetzenecker@meduniwien.ac.at

Appendix 1: Database format and submission of data

The first step is to request and obtain a login account through the relevant link found in the ESTS homepage (<http://www.ests.org>) or by directly sending an email to one of the members of the Database Committee. Once you have a valid login account you can proceed through the following data entry interface (accessible through <https://ests.kdataclinical.it>).

The KData logon screen shown below has been engineered to provide enhanced security facilities:

- Limiting users to 3 logon attempts before locking the user-account
- Giving information on previously successful and unsuccessful logon attempts
- Requiring users to have an eight-character password that contains at least one uppercase character, one lowercase character and one digit.

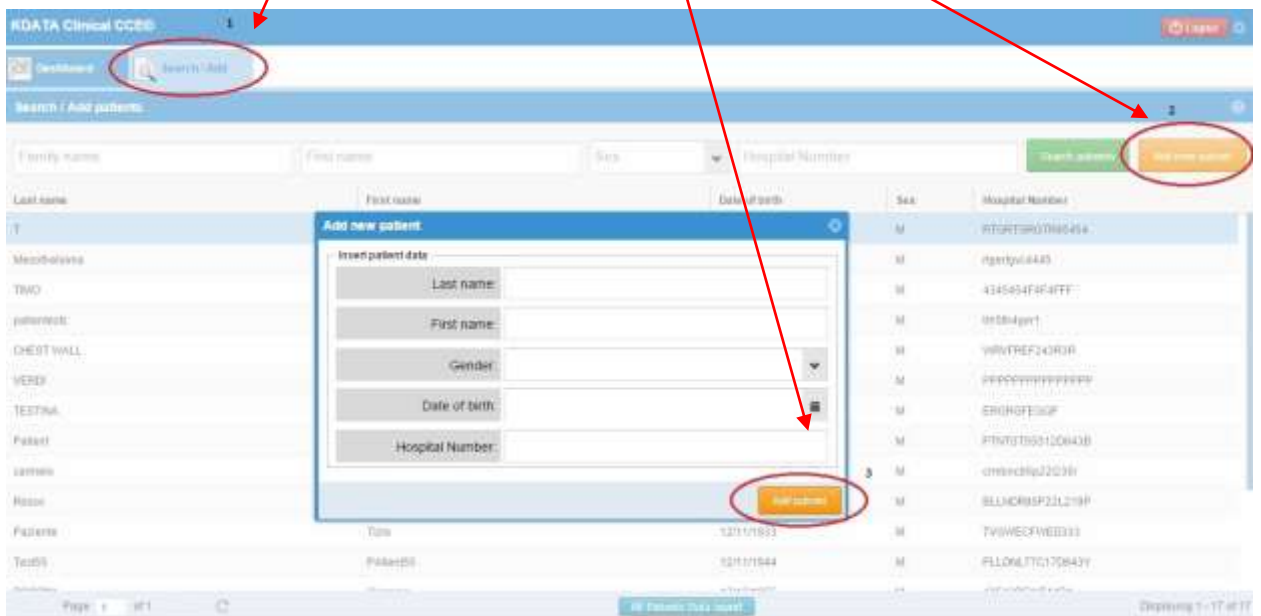


Once you have logged in you are presented with the Database main menu, from which you can add new data, view or edit a procedure, modify your account details, and export your data in Excel for your own purposes.

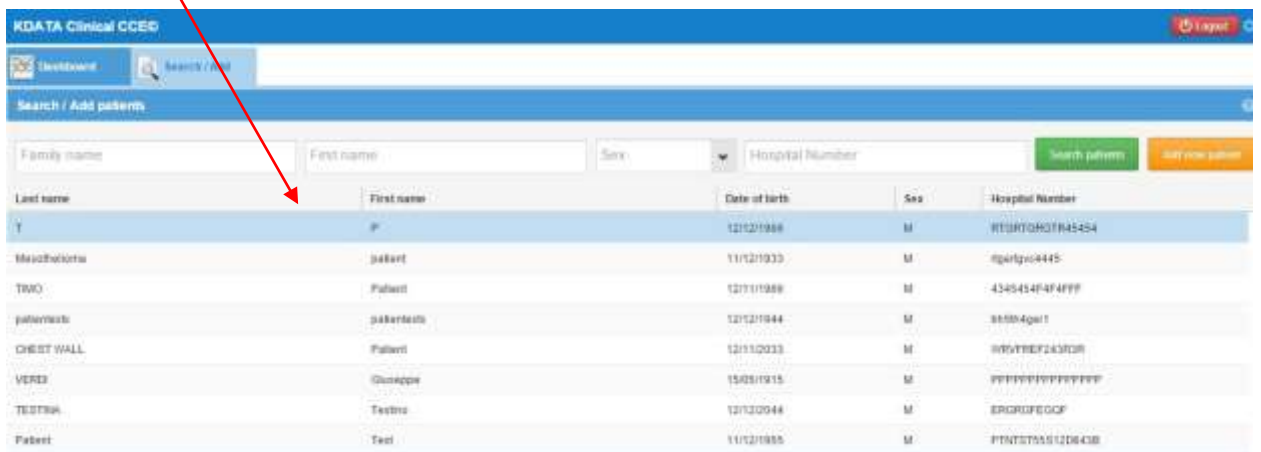


Clicking on the Search/Add tab opens the next screen “Patient Search”, where it is possible to search for patients already in the database or add new patients.

The function Search/Add (1) is for looking for an existing Patient or adding a new one; the function Add New Patients opens a new screen (2) to collect the unique identifying details of a New Patient where a set of mandatory data is required to add a new patient to the registry; you then save your New Patient by clicking the Add Patient (3) button as shown.



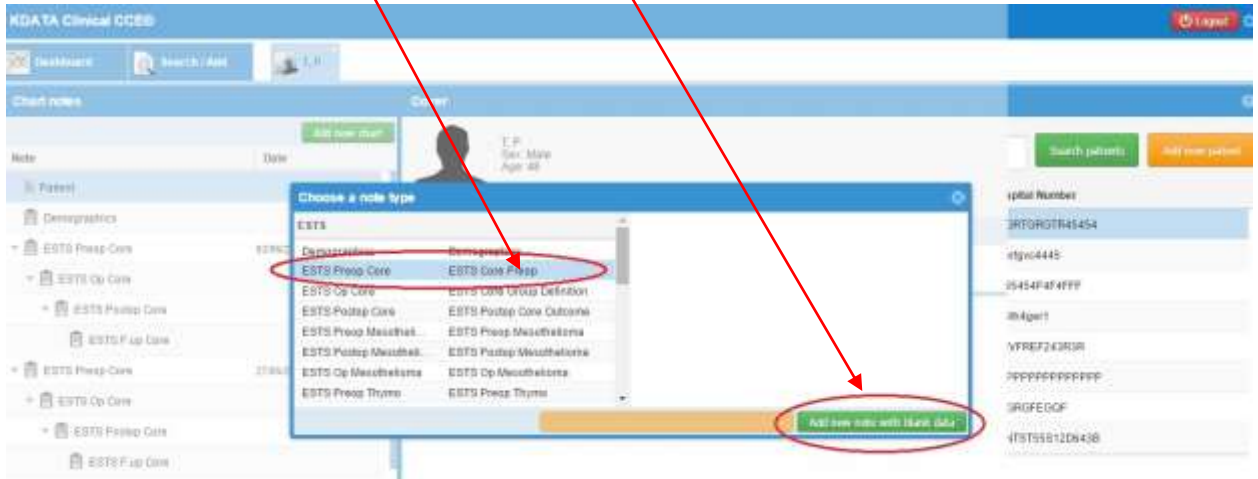
Once you have your New Patient you can select him/her for an appropriate Registry, or access a Patient/Procedure already existing in the Database.



Access to the required Registry (For Example ESTS Core in our case) is obtained by choosing the appropriate “note” from the existing Note List and clicking on the green button “ Add Data to New Note”

Steps: Select the “Note” (1) on Group ESTS

Click on the Add Data to New Note button(2)



These steps will lead you to the Data Collection Section including the routine sections:

Pre-op

Op

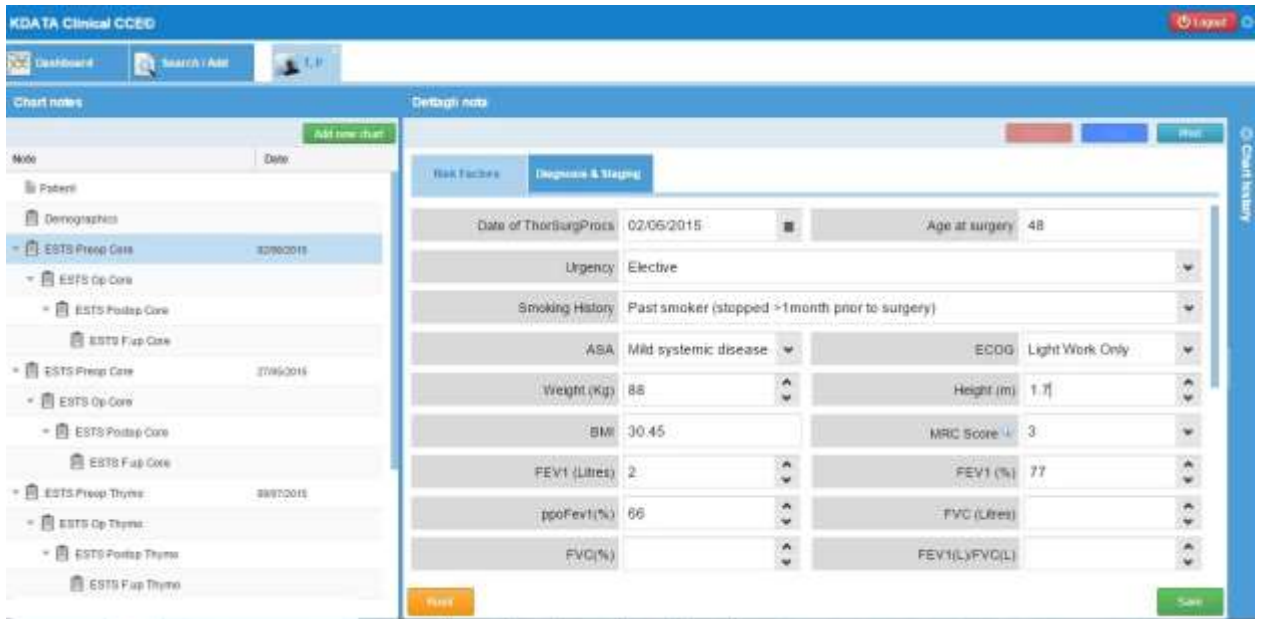
Post-Op

Follow-up.

For the following Registries:

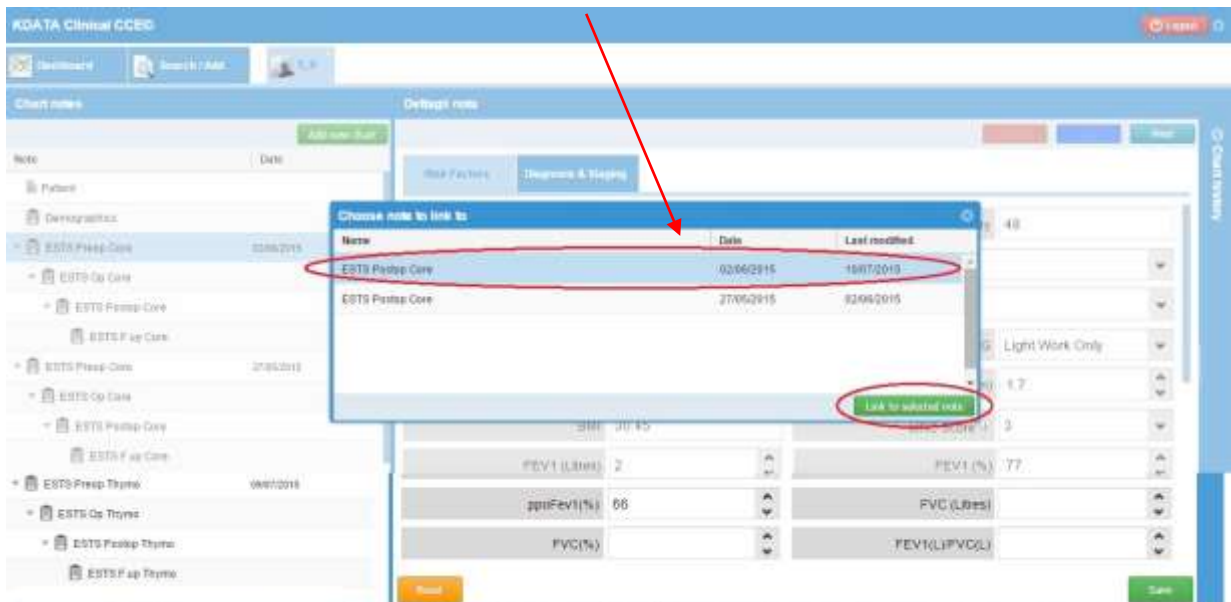
Core, Mesothelioma, Thymus, NETTs, Chest Wall Datasets.

PLEASE NOTE that you need to save your data by clicking on the “save” button any time you have completed a section of the registry even if there are some triggers on the application that save the data automatically by default.

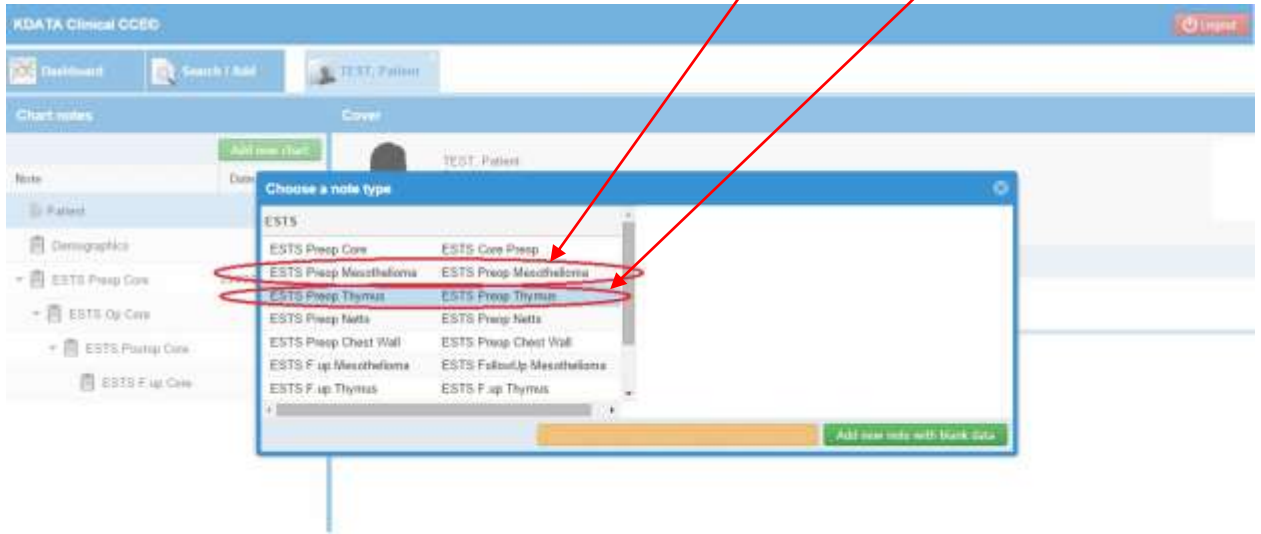


Similar steps are available for the Follow-up section of the Core Dataset section as shown are below:

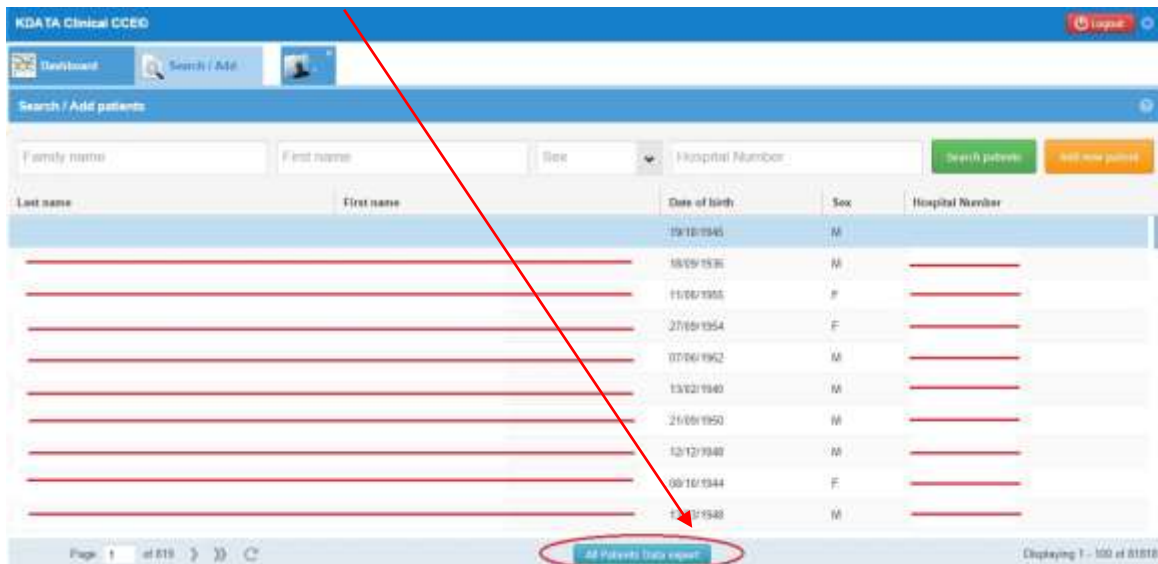
Please note that the User needs to specify to which Procedure the current Follow-up Note is referring to: as shown here below there may be more than one procedure for the same Patient.



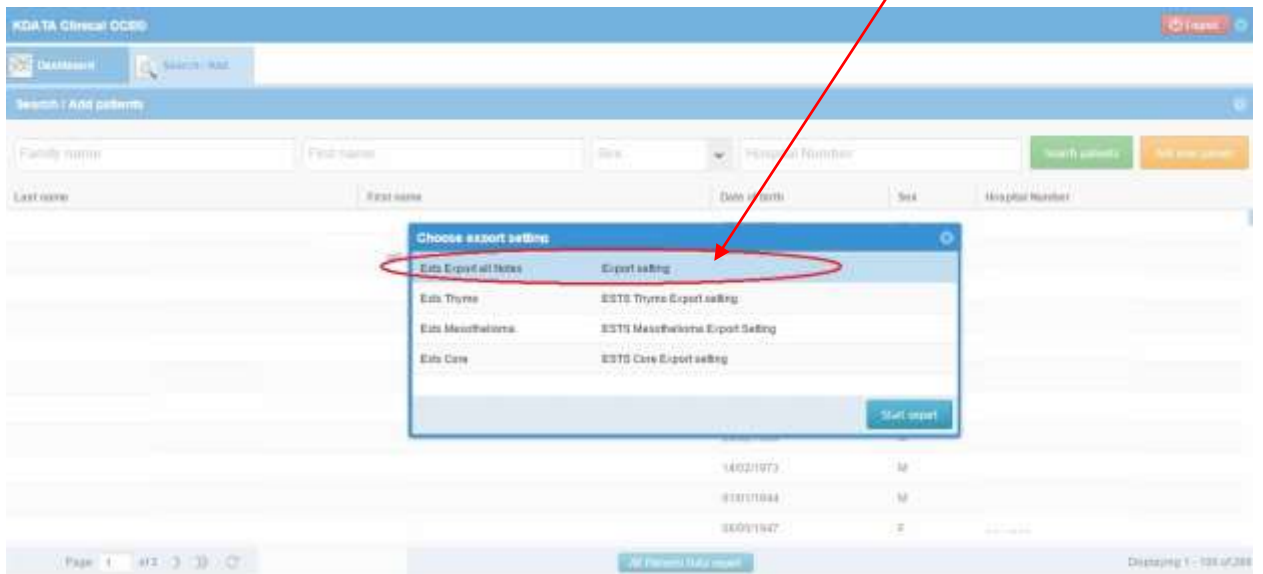
The system permit to select the specific form: Core Dataset, Thymus, Mesothelioma, Netts and Chest Wall . All the form are defined on the ESTS Core Dataset but any type has specific fields.



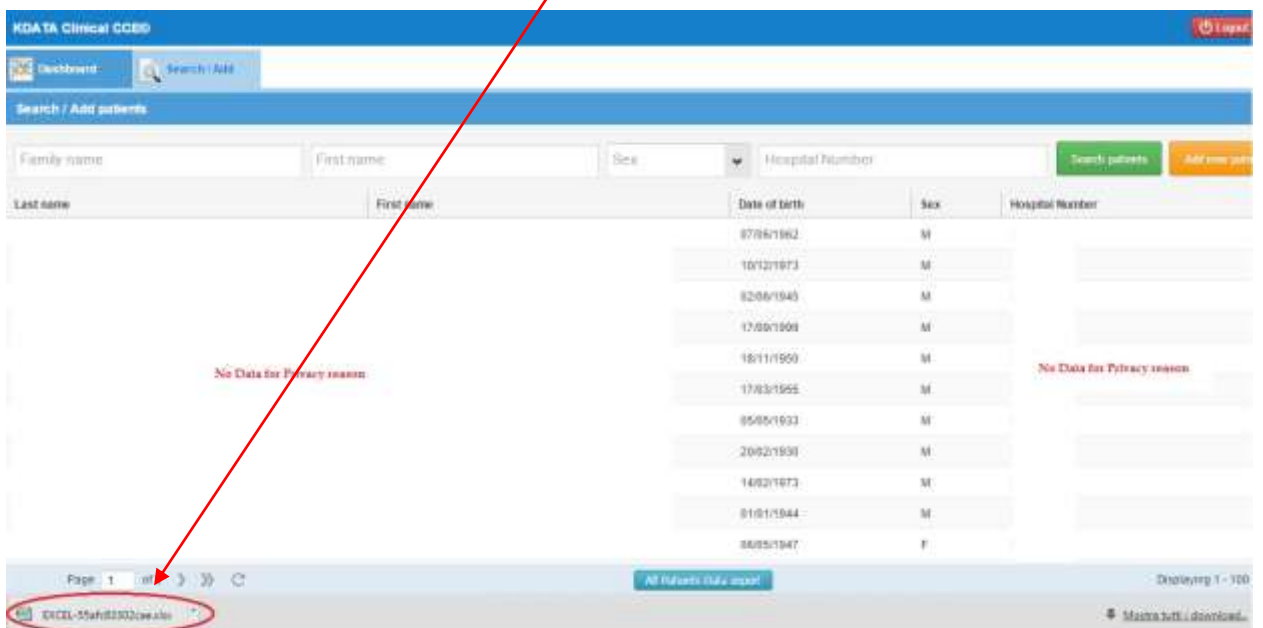
In summary the first step after put in the demographics data or search a patient just saved is to select the specific note and in case of thymo or MEsothelioma or NEtts or chest wall is necessary select the specific note.
In any case the total export permit to have a cumulative file with all type of procedures



After is possible select the type of export : all procedures as in the follow case:



After you can open the file downloaded on the taskbar below



Clinical Care Analysis CCA or System Dashboard.

The first screen after logging in on the system shows a real-time representation of your Centre surgical activities:



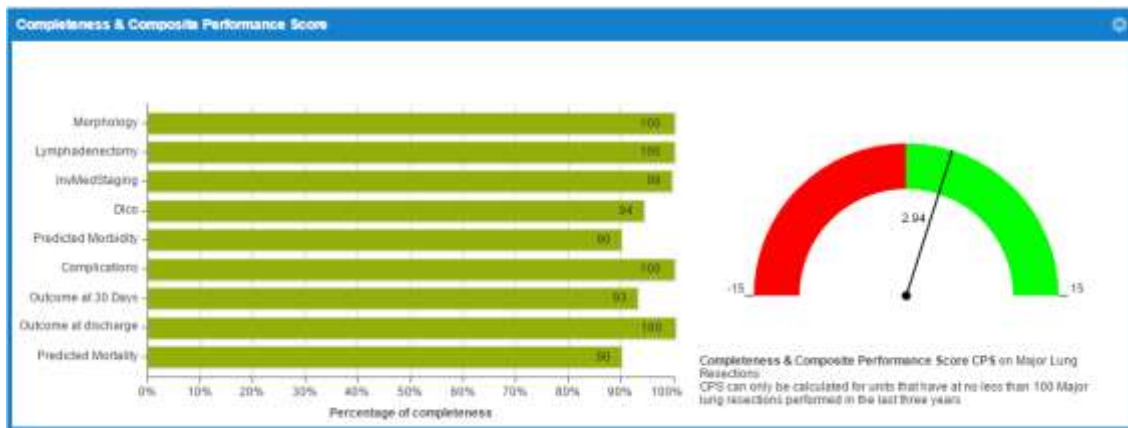
It gets updated each time you add any data into it; it includes an enumeration of the total thoracic surgery recorded activities, with details about lung resections, proportion of VATS and outcome at discharge. Here we have shown the global set visible to the ESTS Database Director only. Each Centre Director can see her/his own Centre data, and nobody else. Specific analysis contents have been developed for the satellite Registries.

Completeness and Composite Performance Score.

The system auto-calculates both the Predicted Mortality (%) and Predicted Morbidity (%).

Early outcomes, including in-hospital morbidity, in-hospital and 30-days mortality should be specified in the final section, before submitting the data.

The system calculates the CPS automatically if there are more than 100 major lung excision procedures, and it shows the percentage of Data Completeness, as illustrated here below.



Appendix 2: Definition of major cardiopulmonary complications listed in the database

ARDS: Adult respiratory distress syndrome defined according to the American-European consensus conference. All of the following criteria should be met:

1. Acute onset
2. Arterial hypoxemia with PaO₂/FIO₂ ratio lower than 200 (regardless PEEP level)
3. Bilateral infiltrates at chest radiograph or CT scan
4. No clinical evidence of left atrial hypertension or pulmonary artery occlusive pressure < 18 mmHg
5. Compatible risk factors

Initial ventilator support >48 hours: Patient initially was ventilated >48 hours in the postoperative period; ventilator support ends with removal of endotracheal tube or, if the patient has a tracheostomy tube, until no longer ventilator dependent.

Reintubation: Patient was reintubated during the initial hospital stay after the initial extubation; this may include patients who have been extubated in the operating room and require intubation in the postoperative period

Atrial Arrhythmia: new onset of atrial fibrillation/flutter (AF) requiring medical treatment or cardioversion. Does not include recurrence of AF which had been present preoperatively.

Ventricular Arrhythmia: sustained ventricular tachycardia or ventricular fibrillation that has been clinically documented and treated by ablation therapy, implantable cardioverter defibrillator, permanent pacemaker, pharmacologic treatment or cardioversion.

Bronchoscopy for atelectasis: postoperative atelectasis documented clinically or radiographically that needed bronchoscopy.

Pneumonia: defined according to the last CDC criteria. Two or more serial chest radiographs with at least **one** of the following:

- New or progressive and persistent infiltrate
- Consolidation
- Cavitation

And at least **one** of the following:

- Fever (>38°C or >100.4°F) with no other recognized cause
- Leukopenia (<4000 WBC/mm³) or leukocytosis (≥12,000 WBC/mm³)
- For adults ≥70 years old, altered mental status with no other recognized cause

and at least **two** of the following:

- New onset of purulent sputum, or change in character of sputum, or increased respiratory secretions, or increased suctioning requirements
- New onset or worsening cough, or dyspnea, or tachypnea
- Rales or bronchial breath sounds

Worsening gas exchange (e.g. O₂ desaturations (e.g., PaO₂/FiO₂ ≤ 240), increased oxygen requirements, or increased ventilator demand).

Pulmonary embolism: confirmed by V/Q scan, angiogram or CT scan.

DVT: deep venous thrombosis confirmed by Doppler study, contrast study or other study and that required treatment.

Myocardial infarct: evidenced by one of the following criteria:

1. transmural infarction diagnosed by the appearance of a new Q wave in two or more contiguous leads on ECG.
2. Subendocardial infarction (non Q wave) evidenced by clinical, angiographic electrocardiographic signs.
3. Laboratory isoenzyme evidence of myocardial necrosis.

Renal failure: defined as the onset of new renal failure in the postoperative period according to one of the following criteria:

1. increase of serum creatinine to greater than 2.0, or 2-fold the preoperative creatinine level.
2. a new requirement for dialysis postoperatively.

Cerebrovascular complications: occurrence of one of the following central neurologic postoperative events not present preoperatively:

1. a central neurologic deficit persisting postoperatively for more than 72 hours
2. a transient neurologic deficit (transient ischemic attack or reversible ischemic neurological deficit) with recovery within 72 hours
3. a new postoperative coma persisting at least 24 hours and caused by anoxic/ischemic and/or metabolic encephalopathy, thromboembolic event or cerebral bleed.

Appendix 3: ESTS Institutional Accreditation Program

By Dr Alessandro Brunelli
alexit_2000@yahoo.com



Accreditation program

The ESTS Institutional Accreditation program was initiated in 2011 and is open to all thoracic surgery units participating to the ESTS Database.

The aim of the program is to set standards of good clinical practice across Europe with the intent to improve the quality of care possibly according to published guidelines.

Eligibility Criteria:

- ✓ Participation to the ESTS Database with contribution of at least 150 anatomic lung resections in the last 3 years. This pre-requisite is necessary to calculate a reliable Composite Performance Score, which is the metrics used to evaluate the Institutional performance.
- ✓ The Head of the unit or its Clinical Audit Lead must be an ESTS member.
- ✓ Composite Performance Score greater than 0
- ✓ Completeness of variables used to calculate the Eurolung2 greater than 70%

Based on a similar methodology, ESTS has recently developed and published a Composite Performance Score (CPS) for lung surgery (Brunelli A et al. The European Thoracic Database project: Composite Performance Score to measure quality of care major lung resection. *Eur J Cardiothorac Surg* 2009; 35: 769-774).

The method consists in developing standardized outcome and process indicators covering all temporal domains of the lung resection care. The indicators were selected based on their evidence-based level. For the preoperative domain, we selected the proportion of patients with DLCO measured before major lung resection, and the proportion of patients with clinically suspicious N2 nodes at CT scan or PET scan submitted to some type of preoperative mediastinal invasive staging. For the intraoperative domain, we selected the proportion of patients with primary neoplastic disease submitted to major anatomic resections and at least lobe-specific (or more extended) nodal dissection. To be defined as at least lobe-specific nodal dissection, station 7 should be always included in the dissection in addition to stations R2-4 for right upper lobectomy, stations 8-9 for lower lobectomies, stations 5 and 6 for left upper lobectomies. For the postoperative domain, we selected the risk-adjusted in-hospital cardiopulmonary and mortality rates.

Each of these indicators has been rescaled according to their standard deviation in the entire population to obtain individual standardized indicators. These were then summed to obtain the composite score for each unit.

The risk adjusted morbidity and mortality rates were calculated using the Eurlung1 and Eurlung 2 risk models. The following model were used:

Eurlung 1 was used to adjust cardiopulmonary morbidity:

Logit= $-2.465 + 0.497 \times \text{sex male (coded 1 for male and 0 for female)} + 0.026 \times \text{age} + 0.231 \times \text{CAD (coded 1 for presence of CAD)} + 0.371 \times \text{CVD (coded 1 for presence of CVD)} + 0.152 \times \text{CKD (coded 1 for presence of CKD)} - 0.015 \times \text{ppoFEV1} + 0.514 \times \text{extended resections (coded 1 for presence of extended resection)} + 0.497 \times \text{thoracotomy (coded 1 for thoracotomy and 0 for VATS)}$.

Eurlung 2 was used to adjust 30 day mortality:

Logit= $-5.82 + 0.903 \times \text{sex male (coded 1 for male and 0 for female)} + 0.044 \times \text{age} + 0.264 \times \text{CAD (coded 1 for presence of CAD)} + 0.582 \times \text{CVD (coded 1 for presence of CVD)} - 0.064 \times \text{BMI} + 0.300 \times \text{extended resection (coded 1 for extended resection)} + 0.929 \times \text{pneumonectomy (coded 1 for pneumonectomy and 0 for lesser resection)} + 0.894 \times \text{thoracotomy (coded 1 for thoracotomy and 0 for VATS)} - 0.009 \times \text{ppoFEV1}$.

Standardized scores are calculated by subtracting the observed risk-adjusted outcome or process incidence minus the average observed outcome or process incidence. The difference is then divided by the standard deviation of the observed outcome or process in the entire population.

A CPS greater than 0 is the threshold selected by the Database Committee as a minimum criteria for accreditation. An automatic function has been implemented in the ESTS Database, which allow the end-users to calculate and review at any time their own CPS.

In addition to their CPS, units must have certain structural, procedural and professional characteristics to be certified. These characteristics needs to be audited along a sample of data submitted to the database. To this purpose, ESTS has subcontracted an external auditing Company, which together with a thoracic surgeon will visit the applicant units and produce a report, which will be evaluated by the Database Committee. If the report will be judged satisfactory, the Accreditation will be granted by the ESTS Council. The following are the required structural/procedural/professional characteristics (based and modified from Brunelli A, Falcoz PE, D'Amico T, et al. European guidelines on structure and qualification of general thoracic surgery. Eur J Cardiothorac Surg. 2014;45:779-86).

Procedures Volume:

A suggested minimum volume of 150 +/- 50 major thoracic procedures per year is recommended.

For esophageal resections a minimum volume of 20 +/- 5 procedures per year is recommended.

For lung transplant a minimum volume of 10 procedures per year is recommended.

Qualification of surgeons:

All surgeons must be qualified to perform thoracic surgery according to individual national or European legislation.

The Head of the unit must have a minimum experience of 5 years of clinical practice as qualified thoracic surgeon.

Costs:

The costs for the inspection and auditing (1500 Euros) are the individual Unit's responsibility.

The accreditation will be valid for a 36 months period. After this period the unit must apply for recertification.

Timeline for the accreditation process

MAY:	Central and automatic calculation of the CPS Eligible units announced during ESTS meeting
JUNE:	Invitation letters are sent out to eligible units
JULY:	Deadline acceptance for the accreditation process
AUGUST-MARCH:	Local Audits
APRIL-MAY:	Audit reports reviewed by DB Committee and ESTS Council
MAY:	Accredited units announced during ESTS meeting

ESTS Accreditation Process: a brief review to guide "virtual" Visits

Background and Rationale

As COVID19 has generated various ways to contain it across Europe, it is currently not possible to plan adequately to visit prospective ESTS accreditation Centres in person.

Therefore we propose to amend our current guide as per a "virtual" Visit; here below are the usual criteria revamped to per complied with in a "virtual" mode.

CPS Composite Performance Score Factors

These needs to be read by the Audit Person from each of the selected 10 clinical notes, form the 40 KData have requested in advance. Data must be from either clinical notes (paper) or a local DB that substitute paper notes. The Regent will chose 10 notes on live video, and the audit person will also read the results of each heading on live video.

Preoperative care:

- % of pts having DLCO measured
- % of pts with CT enlarged or PET+ med nodes undergoing preop invasive mediastinal staging

Operative care:

- % of pts operated on for primary neoplastic disease submitted to systematic lymph node dissection

Postoperative care:

- risk-adjusted cardiopulmonary morbidity rate
- risk-adjusted mortality rate

Milestones of Process

- MAY:** - Central calculation of CPS-Eligible units announced at ESTS meeting
- JUNE:** - Invitation letters are sent out to eligible units
- JULY:** - Deadline acceptance for accreditation process
- AUGUST- MARCH:** - Local Audits
- APRIL-MAY:** - Audit reports reviewed by DB Committee and ESTS Council
- MAY:** - Accredited units announced during ESTS meeting

Benefits

- Accredited units will be announced during ESTS Annual Meeting and in the ESTS homepage
- Participation to ESTS quality improvement initiatives
- Participation to high-profile scientific projects supported by ESTS
- Accredited units may propose their own clinical research projects based on data in the database
- *Setting up of Personalised dashboard on ESTS Database own log-in page*

Brief Description of Process and Data Checks

All Units who accept the ESTS invitation to go through the Accreditation Process will be required to:

- ESTS PRE-VISIT QUESTIONNAIRE: A copy of the ESTS PRE-VISIT QUESTIONNAIRE will be sent back BEFORE date of visit; it will contain the ESTS PROFESSIONAL, STRUCTURAL & PROCEDURAL replies and it will be sent back fully compiled to the Regent, the ESTS General Secretary & K-Data Clinical BEFORE the PLANNED VIRTUAL VISIT.
- To make available the from whole 3 year's clinical data 40 notes as from the excel file KData Clinical sent to the Centre; enabling the Regent to choose 10 notes on the day.

A brief PRE-Evaluation Meeting will take place before the proceedings (*Video hosted*)

A Brief POST-Evaluation Meeting All will take place after the proceedings (*Video hosted*)

Data from the notes will be read by the Regent to the KData Clinical person who will record the relevant similarities & discrepancies if any. This method will prevent any untoward breach of Patient Confidentiality. (*Video hosted*)

An Accreditation Visit Report will be circulated to the ESTS General Secretary, to support the final decision to award the actual accreditation to the Unit.

Appendix 4: The Setting of a National Registry in collaboration with ESTS or the “Hungarian Model” Experience



By Dr Attila Enyedi
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The “Hungarian Model” Experience

Dear Colleagues!

It is my privilege to introduce you the Hungarian Chapter of the Silver Book 2022 as the summary of the Hungarian Thoracic Surgical activity from 2017 to 2021 based on the records of the ESTS Hungarian Database. As you might know beside the French Society for Thoracic and Cardiovascular Surgery, Hungary is a total cumulative data provider to ESTS using the Database as The National Database for thoracic surgery. The scaffold of the “ESTS Hungarian Model” was created to become a possible Database for nationally or locally connected centers using the same language, economical background or scientific interest. By doing so, a National dataset summary will highlight all the negative and positive alterations from the European results in clinical practice as well as epidemiology living precise recipe to catch up to the standards or have a beam of satisfaction.

Feedback from the ESTS Database composite score analysis had a clear message where to improve perioperative or intraoperative care, but underlined the strong points of Hungary: the almost doubled VATS ratio compared to the European average and the achievements in postoperative morbidity and mortality. Almost one third of the Hungarian Units are already gained accreditation in the last years (Debrecen, Szeged, Szolnok) motivating all other future applicants to achieve elevated treatment quality control through the hints of the Database.

To enhance and ease up the efficacy of patient data record and contribution in the European Registry measures are taken to create a nation-wide standardized documentation formula for thoracic surgical patients incorporating all viewpoints of

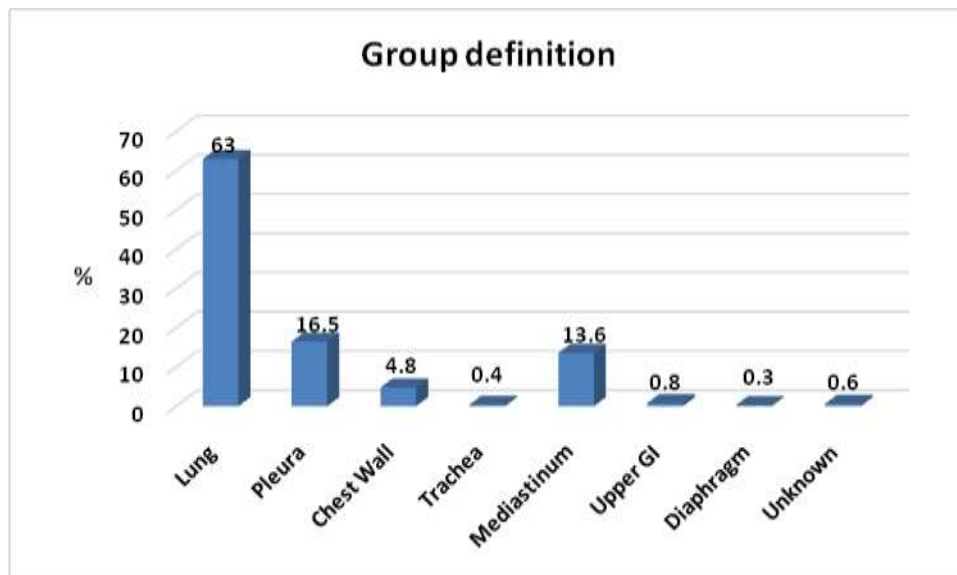
the ESTS Dataset proceeding from the tumor board records up to the follow up documentation of the patients.

Dr Attila Enyedi
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Hungarian Cumulative Data

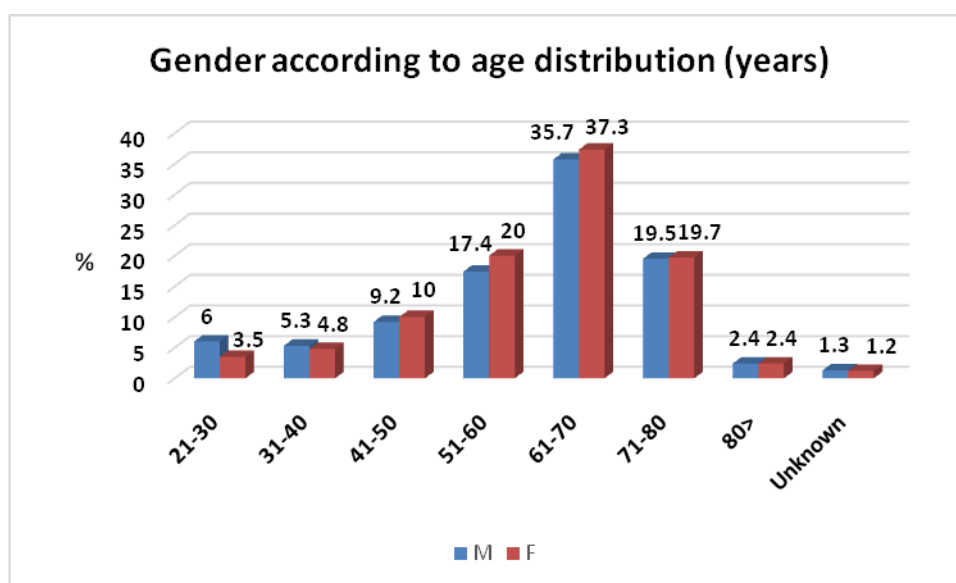
Group Definitions

Group Definition	Occurrences	Percent
Lung	15306	63
Pleura	4016	16.5
Chest Wall	1162	4.8
Trachea	98	0.4
Mediastinum	3306	13.6
Upper GI	183	0.8
Diaphragm	78	0.3
Unk	158	0.6
Total	24307	100



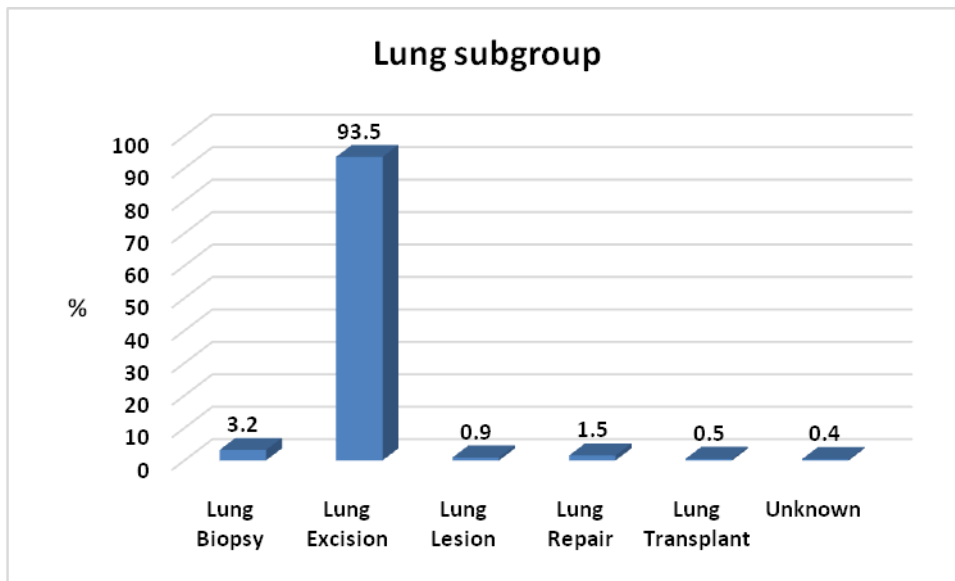
Gender according to age distribution (years)

Age (years)	Male (%)	Female (%)
<=20	3.2	1.1
21-30	6	3.5
31-40	5.3	4.8
41-50	9.2	10
51-60	17.4	20
61-70	35.7	37.3
71-80	19.5	19.7
>80	2.4	2.4



Lung Subgroup

	Occurrences	Percent
Lung Biopsy	490	3.2
Lung Excision	14315	93.5
Lung Lesion	143	0.9
Lung Repair	224	1.5
Lung Transplant	78	0.5
Unk	56	0.4
Total	15306	100

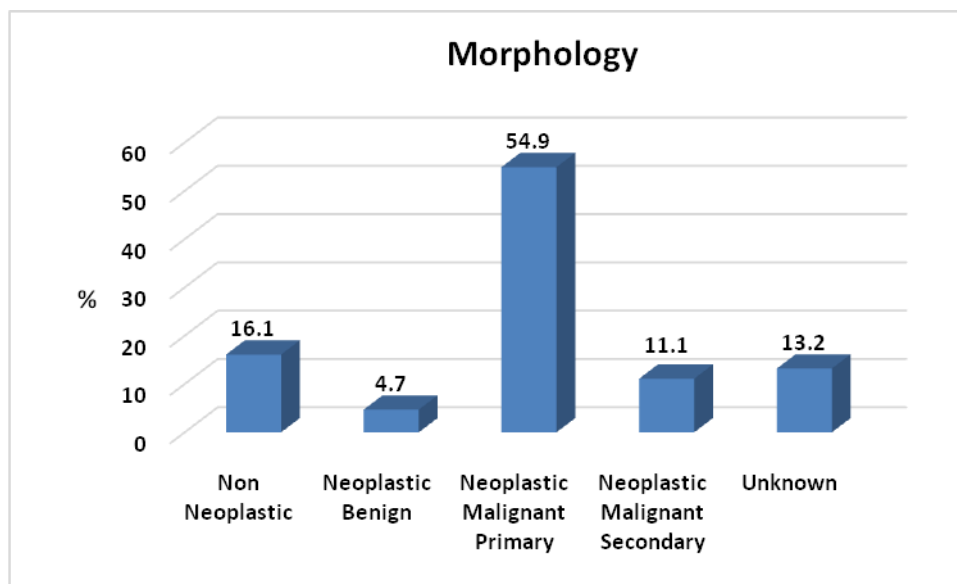


Lung Excision Procedure

	Occurrences	Percent
Bilobectomy	220	1.5
Lobectomy	6989	48.8
Lung Volume Reduction	28	0.2
Pneumonectomy	621	4.4
Segmentectomy	856	6
Wedge	5524	38.6
Unk	77	0.5
Total	14315	100

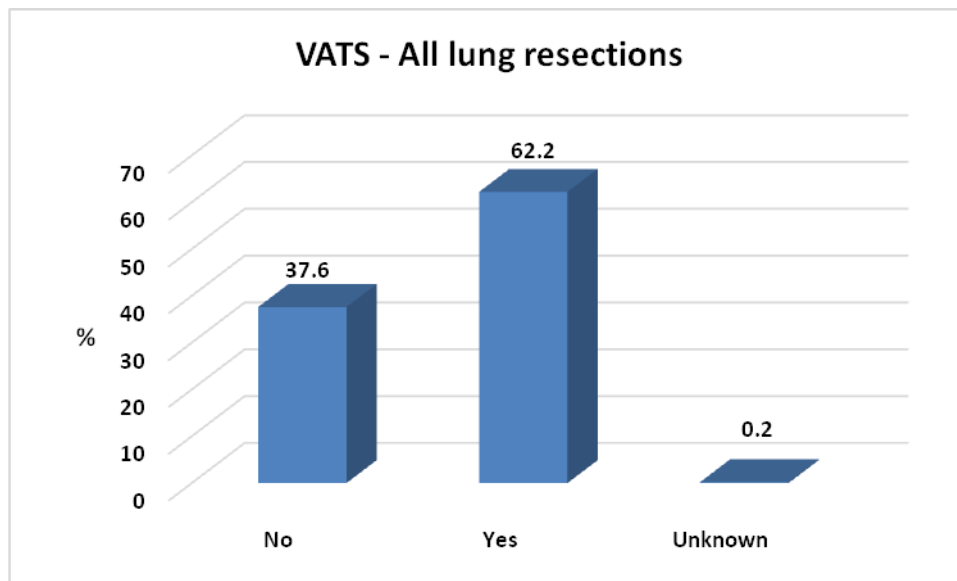
Lung resections pathology

Morphology	Occurrences	Percent (%)
Non Neoplastic	2298	16.1
Neoplastic Benign	671	4.7
Neoplastic Malignant Primary	7853	54.9
Neoplastic Malignant Secondary	1596	11.1
Unknown	1897	13.2
Total	14315	100



Lung resections pathology (All lung resections)

VATS	Occurrences	Percent (%)
No	5376	37.6
Yes	8904	62.2
Unknown	35	0.2
Total	14315	100

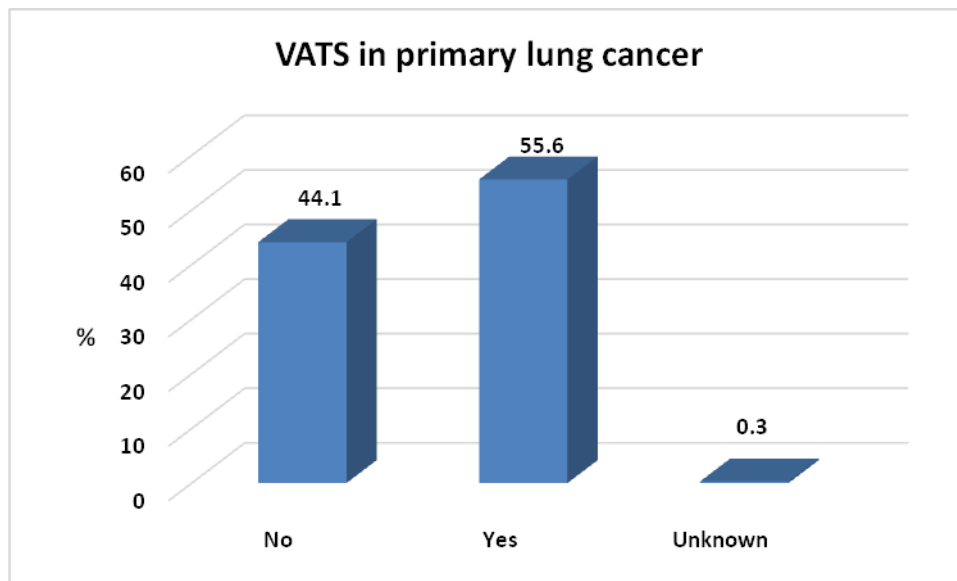


Lung resections pathology (Only Lobectomy)

VATS	Occurrences	Percent (%)
No	2995	42.8
Yes	3981	57
Unknown	13	0.2
Total	6989	100

Lung resections pathology (Primary malignant)

VATS	Occurrences	Percent (%)
No	3462	44.1
Yes	4368	55.6
Unknown	23	0.3
Total	7853	100

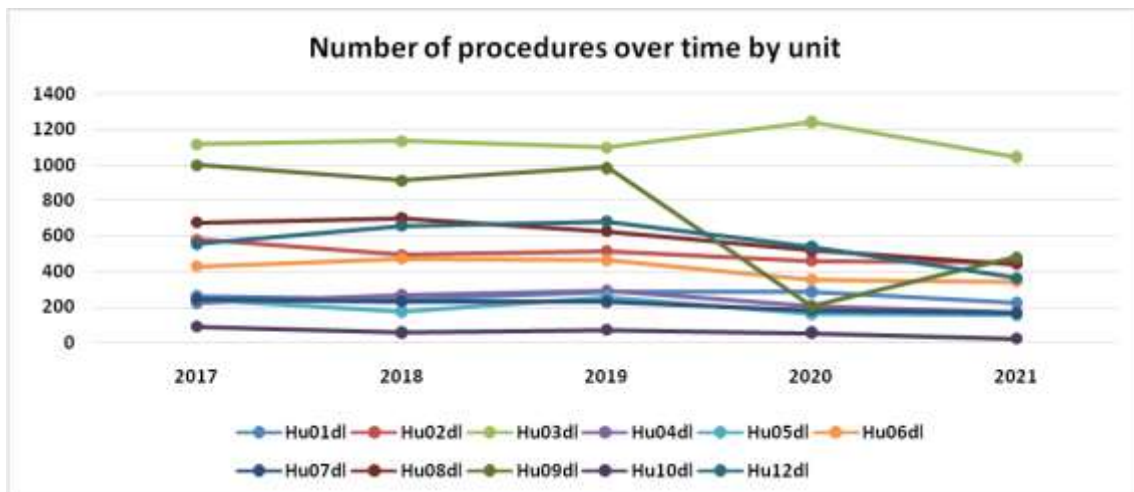


Unadjusted in-hospital mortality rates in lung excision procedures (Primary Lung Cancer)

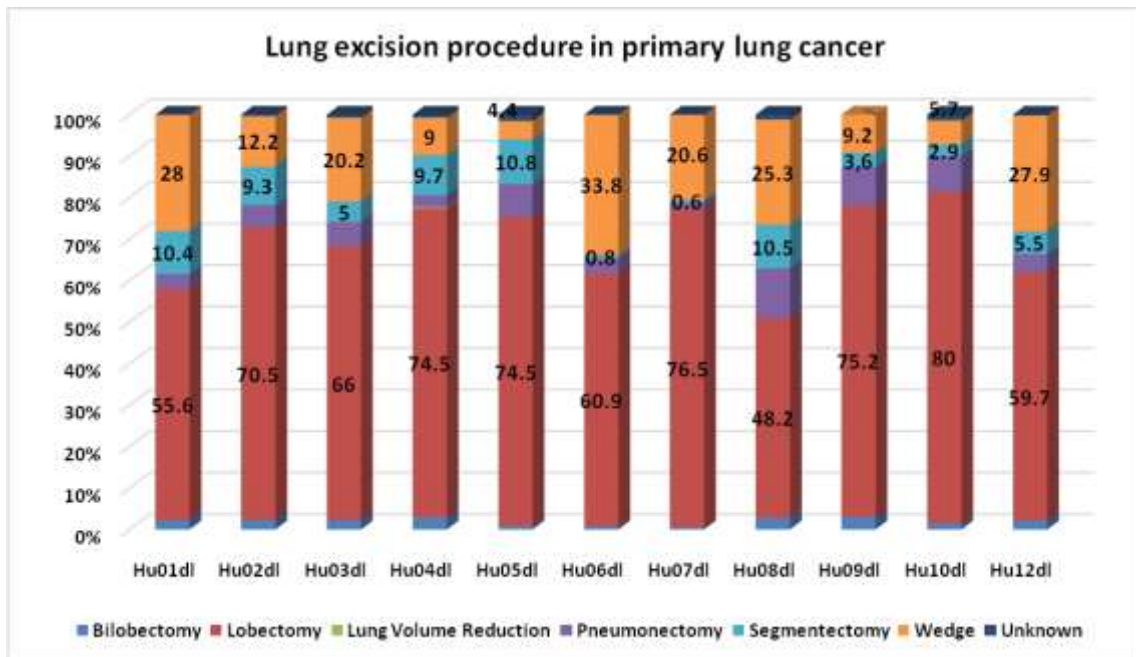
Outcome at Discharge - Died in Hospital	N	Died in Hospital	Percent(%)
Bilobectomy	159	4	2.5
Lobectomy	4848	26	0.5
Lung Volume Reduction	1	0	0
Pneumonectomy	444	14	3.2
Segmentectomy	498	3	0.6
Wedge	1529	3	0.2
Total	7479	50	0.7

Units specific activity & Comparative Analysis between contributing units

Units	2017	2018	2019	2020	2021	Total
Hu01dl	261	240	287	284	223	1295
Hu02dl	579	493	515	461	454	2502
Hu03dl	1116	1134	1098	1242	1044	5634
Hu04dl	226	266	293	206	169	1160
Hu05dl	240	174	254	159	154	981
Hu06dl	430	472	463	353	343	2061
Hu07d	243	233	229	182	166	1053
Hu08dl	676	700	626	519	442	2963
Hu09dl	998	913	984	202	477	3574
Hu10dl	88	56	70	54	22	290
Hu12dl	553	658	680	540	363	2794
Total	5410	5339	5499	4202	3857	24307



Unit	Total	Bilobectomy	Lobectomy	Lung Volume Red.	Pneumonectomy	Segmentectomy	Wedge	Missing
Hu01dl	656	2.3	55.6	0	3.7	10.4	28	0
Hu02dl	106	4	2.3	70.5	0	5.4	9.3	12.2
Hu03dl	238	0	2.3	66	0	5.8	5	20.2
Hu04dl	310	0	2.9	74.5	0.3	2.9	9.7	9
Hu05dl	342	0	0.9	74.5	0	7.9	10.8	4.4
Hu06dl	379	0	0.8	60.9	0	3.7	0.8	33.8
Hu07dl	350	0	0.6	76.5	0	1.7	0.6	20.6
Hu08dl	800	0	2.8	48.2	0	12	10.5	25.3
Hu09dl	524	0	3	75.2	0	9	3.6	9.2
Hu10dl	70	0	1.4	80	0	8.6	2.9	5.7
Hu12dl	978	0	2.2	59.7	0	4.5	5.5	27.9
Total	785	3	2.2	64.8	0	6	6.6	19.9



Lung resections pathology (Only Lobectomy – Primary Lung Cancer)

Unit	VATS NO(%)	VATS YES(%)
Hu01dl	33.2	66.8
Hu02dl	44.5	55.5
Hu03dl	36.6	63.4
Hu04dl	43.3	54.5
Hu05dl	30.6	69.4
Hu06dl	77.5	22.5
Hu07dl	13.8	86.2
Hu08dl	75.6	24.4
Hu09dl	53.3	46.7
Hu10dl	75	25
Hu12dl	40.4	59.1

**Appendix 5: Report from SBCT Sociedade Brasileira de
CirurgiaThoracica (Brazilian Model)**



**Banco de Dados da SBCT
Relatório Anual 2021**



Diretoria da SBCT

Presidente

Artur Gomes Neto

Vice-Presidente

Francisco Neto

Secretário Geral

Carlos Daudt

Tesoureiro

Leticia Villiger

Secretário Científico

Daniel Bonomi

Secretário de Assuntos Internacionais

Paula A. Ugalde

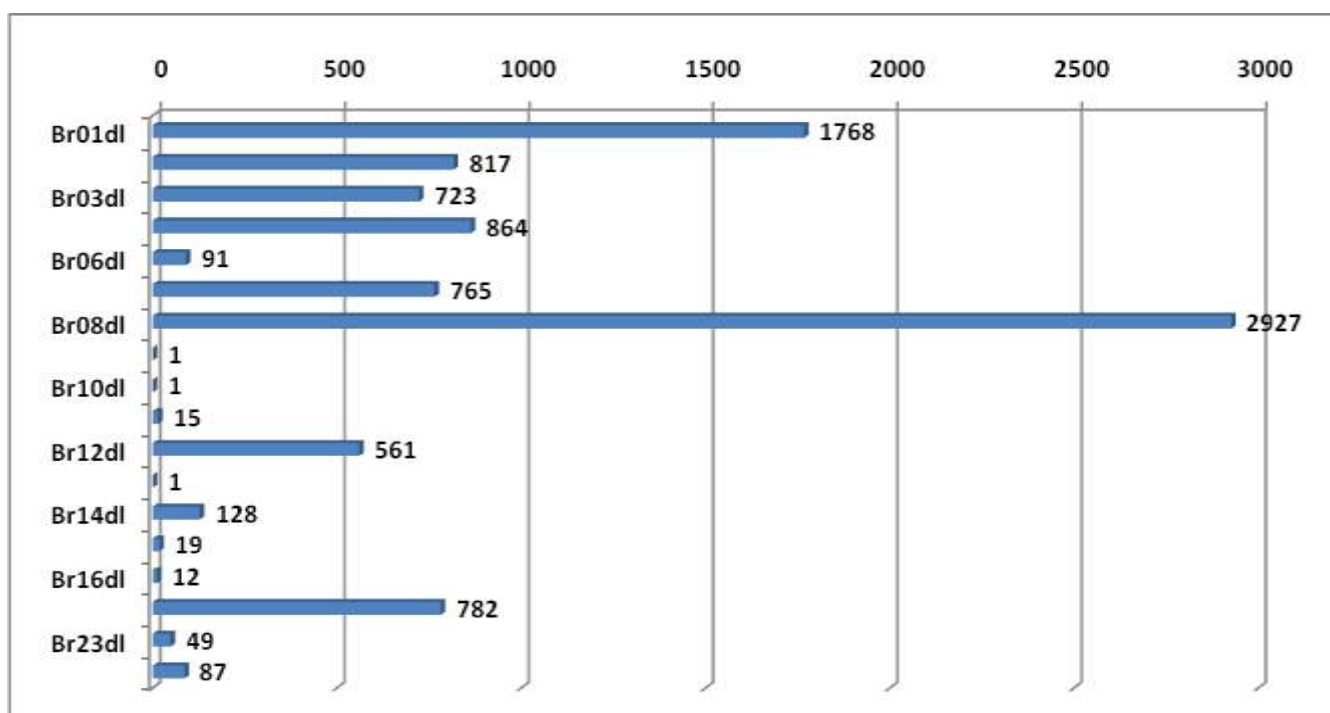
Escritório: Av. Paulista, 2073, Horsa I, cj. 518
São Paulo – SP, CEP: 01311-300
E-mail: secretaria@sbct.org.br

Instituições que contribuíram com o Banco de Dados da SBCT de 2015 a 2021

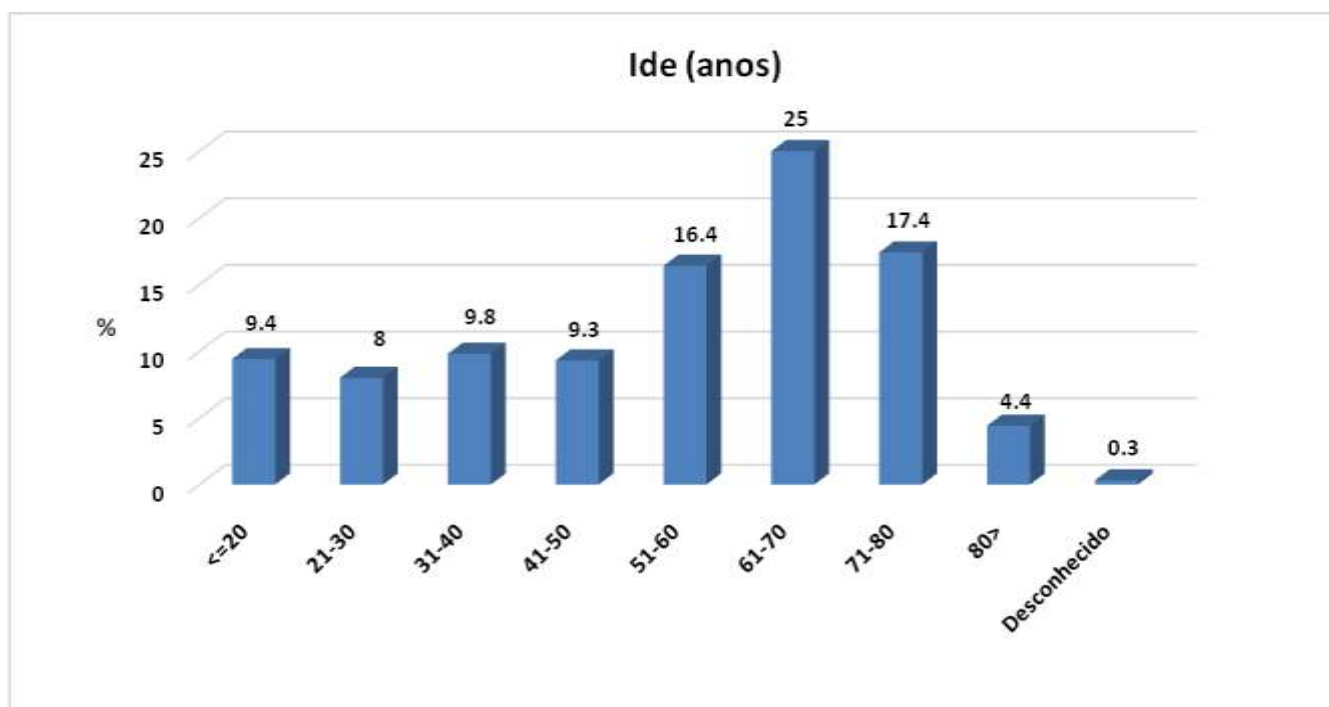
Instituição	Estado	Responsável local pelo banco de dados
Instituto do Coração (InCor) - USP	São Paulo	Ricardo M. Terra / Leticia Leone Lauricella
Instituto do Câncer do Estado de São Paulo (ICESP) - USP	São Paulo	Ricardo M. Terra / Leticia Leone Lauricella
Hospital Universitário Pedro Ernesto	Rio de Janeiro	Carlos Eduardo Teixeira Lima
Hospital Júlia Kubitschek - FHEMIG	Minas Gerais	Leonardo Brand Rodrigues
Hospital Madre Teresa	Minas Gerais	Leonardo Brand Rodrigues
Hospital Porto Dias	Pará	Geraldo Roger Normando
Hospital Universitário Onofre Lopes - UFRN	Rio Grande do Norte	Carlos Alberto A. Araujo
Hospital São Lucas - PUCRS	Rio Grande do Sul	Maria Teresa Ruiz Tsukazan / José Antonio de Figueiredo Pinto
Hospital Universitário de Brasília	Distrito Federal	Guilherme Caçado Rezende / Nuno Ferreira de Lima
Hospital Brasília	Distrito Federal	Guilherme Caçado Rezende / Nuno Ferreira de Lima
Hospital Universitário Lauro Wanderley	Paraíba	Petrucio Abrantes Sarmiento
Hospital de Messejana	Ceará	Antero Gomes Neto
Hospital Santa Luzia Rede D'or	Distrito Federal	Humberto Alves de Oliveira
Hospital de Base do Distrito Federal	Distrito Federal	Joaquim Euclides Melo Araújo / Humberto Alves de Oliveira
Santa Casa de Misericórdia da Bahia	Bahia	Gustavo A. Fortunato
Pavilhão Pereira Filho - Santa Casa de porto Alegre	Rio Grande do Sul	Spencer Marcantonio Camargo
Hospital Sancta Maggiore Higienopolis	Sao Paulo - SP	Julio Mott
Torre Medica Clinica Portoazul	Consultorio	Diego Pardo
Hospital de Clínicas de Porto Alegre - Serviço de CirurgiaTorácica-HCPA	Porto Alegre,	Mauricio Guidi Saueressig

Gráficos

Número de unidades envolvidas no Banco de dados SBCT/ESTS até dezembro de 2021 (Unidade/procedimentos)



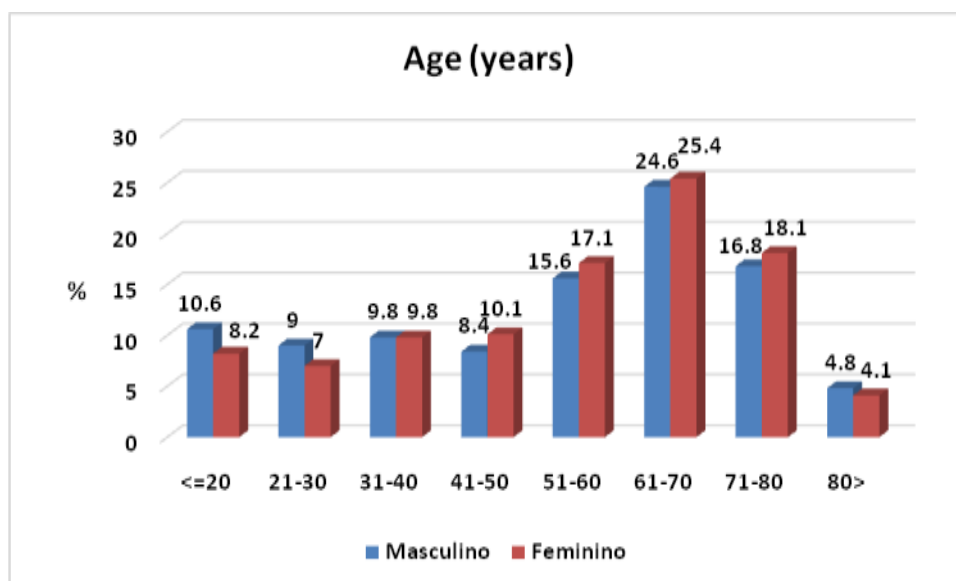
Distribuição de idade e gênero



Idade (anos)	Pacientes	%
<=20	903	9.4
21-30	768	8
31-40	941	9.8
41-50	891	9.3
51-60	1571	16.4
61-70	2406	25
71-80	1675	17.4
>80	427	4.4
Desconhecido	29	0.3
Total	9611	100

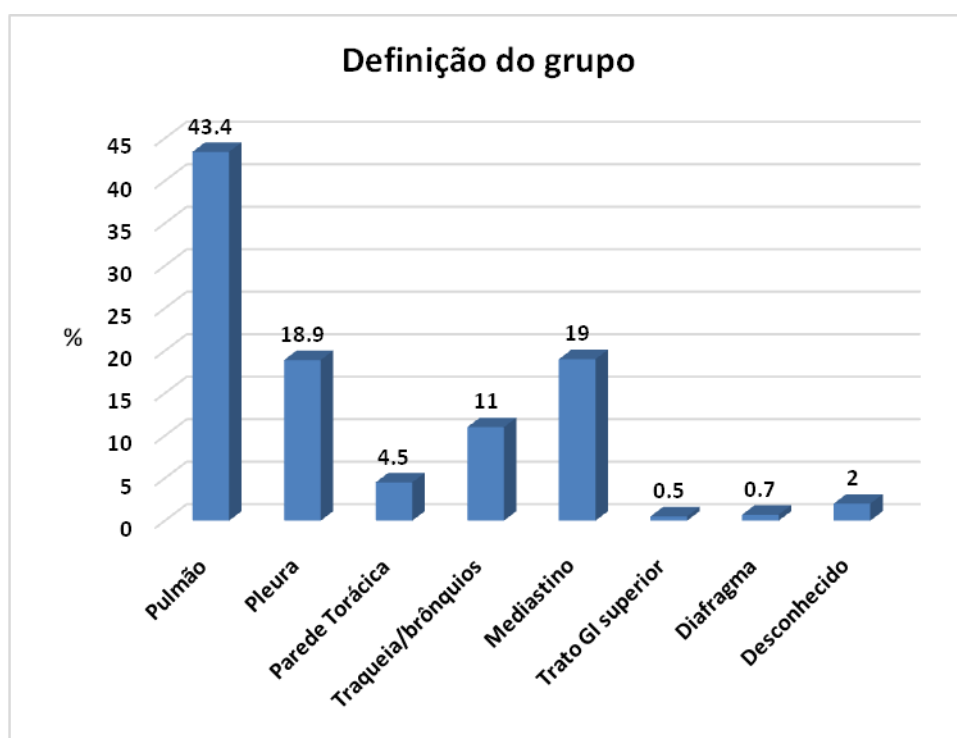
Distribuição de gênero por faixa etária (anos)

	Masculino (%)	Feminino (%)
≤ 20	10.6	8.2
21-30	9	7
31-40	9.8	9.8
41-50	8.4	10.1
51-60	15.6	17.1
61-70	24.6	25.4
71-80	16.8	18.1
>80	4.8	4.1
Desconhecido	0.4	0.2



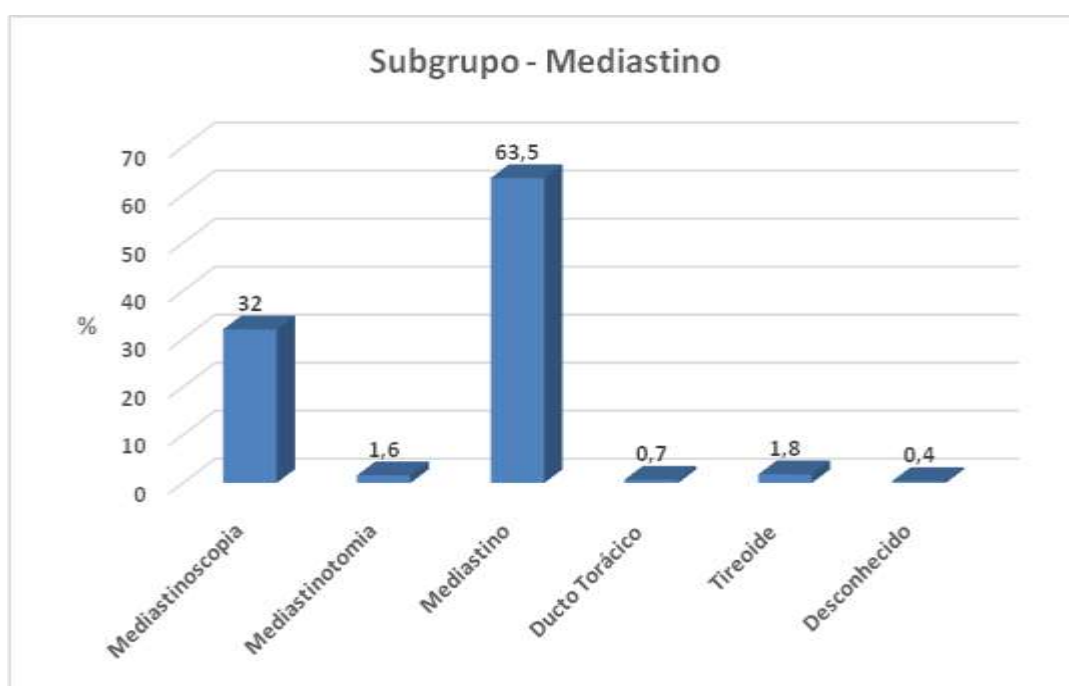
Total de cirurgias realizadas definição dos grupos

Definição do grupo	Procedimentos	%
Pulmão	4171	43.4
Pleura	1813	18.9
Parede Torácica	430	4.5
Traqueia/brônquios	1061	11
Mediastino	1823	19
Trato GI superior	50	0.5
Diafragma	71	0.7
Desconhecido	192	2
Total	9611	100



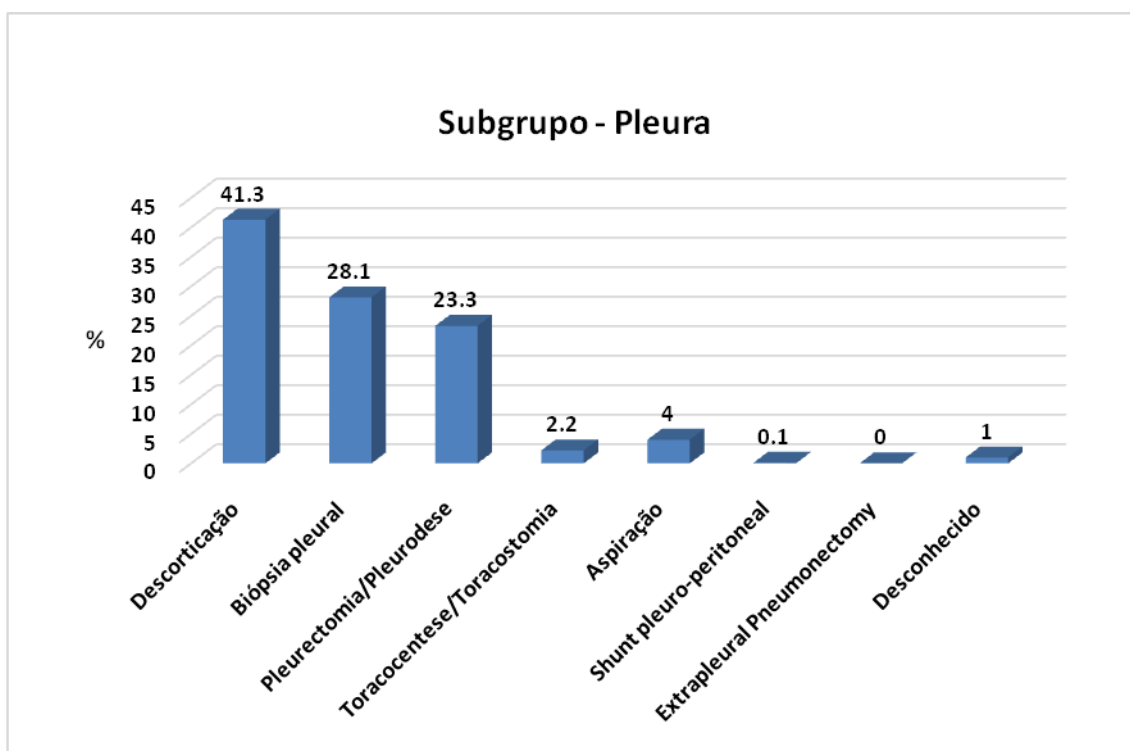
Subgrupo - Mediastino

	Procedimentos	%
Mediastinoscopia	581	31.9
Mediastinotomia	27	1.5
Mediastino	1161	63.7
Ducto Torácico	13	0.7
Tireoide	34	1.8
Desconhecido	7	0.4
Total	1823	100



Subgrupo - Pleura

	Procedimentos	%
Descorticação	748	41.3
Biópsia pleural	509	28.1
Pleurectomia/Pleurodese	422	23.3
Toracocentese/Toracostomia	40	2.2
Aspiração	73	4
Shunt pleuro-peritoneal	2	0.1
Extrapleural Pneumonectomy	1	0
Desconhecido	18	1
Total	1813	100



Ressecções Pulmonares

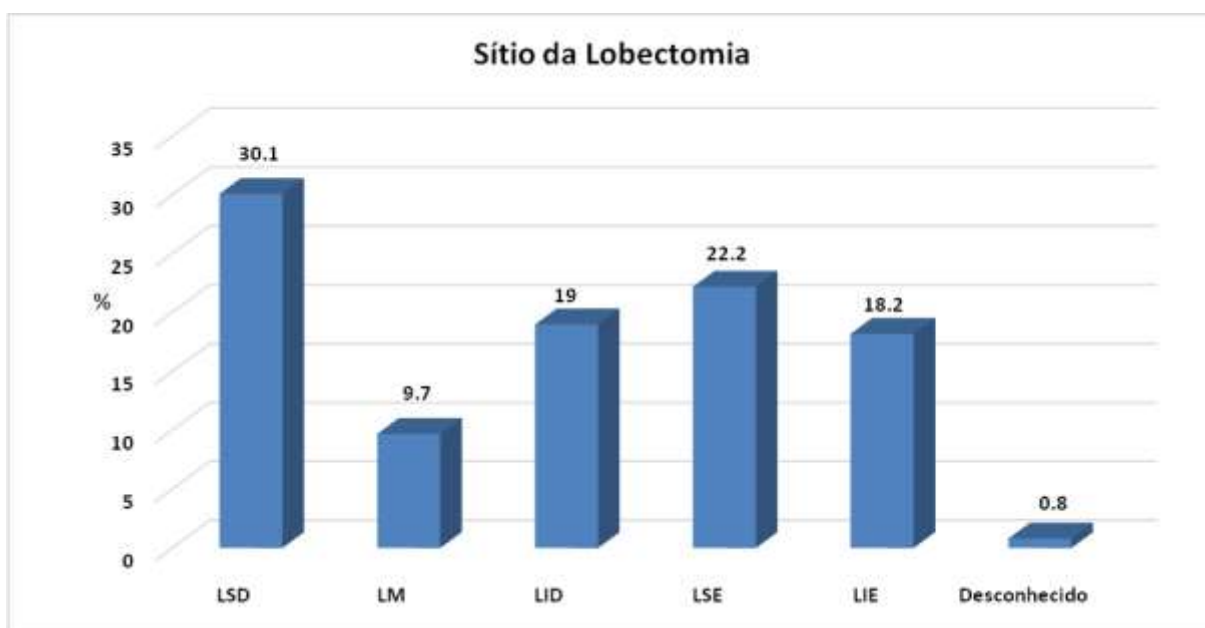
Tipo de ressecção pulmonar realizada, incluindo todos os diagnósticos

	Procedimentos	%
Bilobectomia	87	2.6
Lobectomia	2000	60.2
Cirurgia Redutora do Volume pulmonar	2	0.1
Pneumonectomia	192	5.8
Segmentectomia	413	12.4
Ressecção em cunha	613	18.4
Desconhecido	17	0.5
Total	3324	100



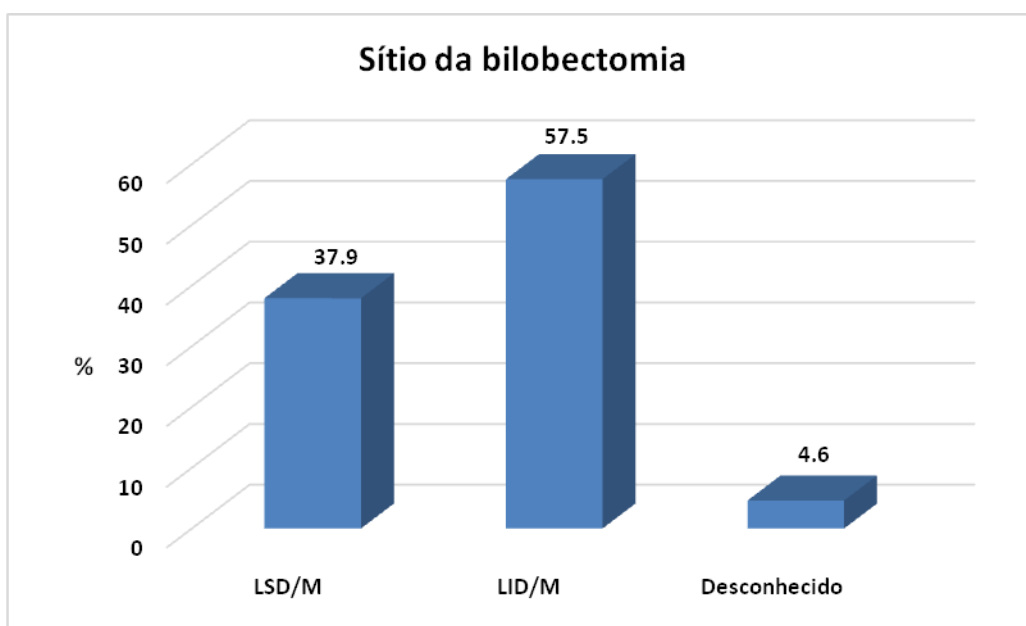
Distribuição das lobectomias por sítio de ressecção

Sítio da Lobectomia	Procedimentos	%
LSD	602	30.1
LM	195	9.7
LID	379	19
LSE	444	22.2
LIE	363	18.2
Desconhecido	17	0.8
Total	2000	100



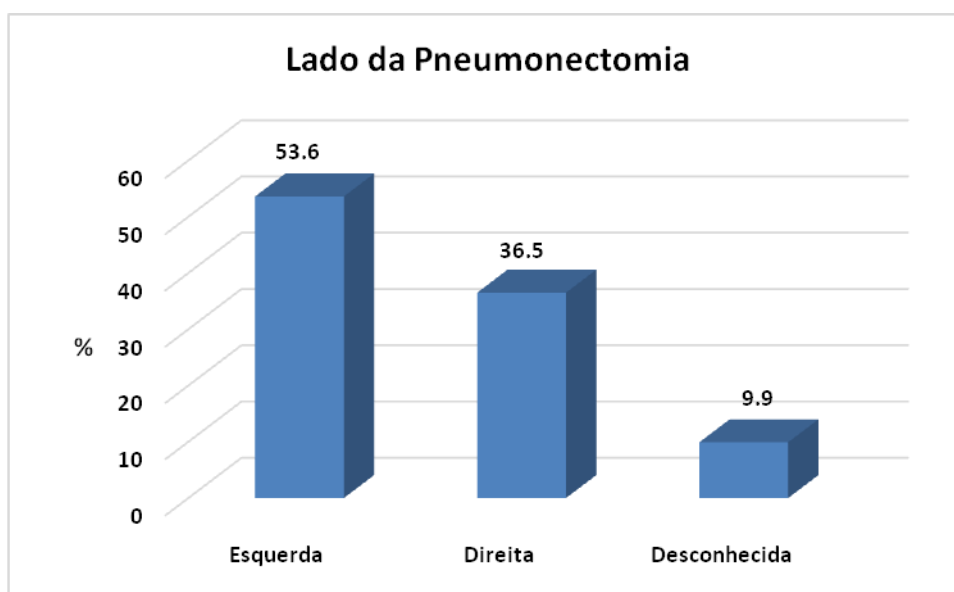
Distribuição da bilobectomiaú pelo sitio de ressecção

Sítio da bilobectomia	Procedimentos	%
LSD/M	33	37.9
LID/M	50	57.5
Desconhecido	4	4.6
Total	87	100



Distribuição da Pneumonectomia pela lateralidade

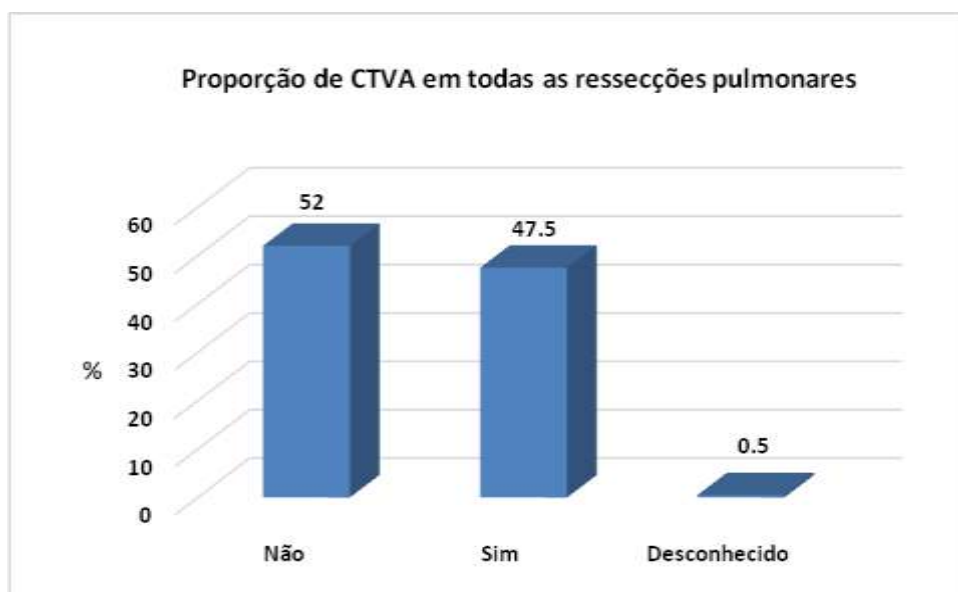
Lado da Pneumonectomia	Procedimentos	%
Esquerda	103	53.6
Direita	70	36.5
Desconhecida	19	9.9
Total	192	100



Tipo de Pneumonectomia	Procedimentos	%
Alone	126	65.6
Completion	15	7.8
Intrapericardial	19	9.9
Pleuropneumectomy	9	4.7
Sleeve Resection	0	0
Diaphragm Resection	0	0
Atrial Resection	3	1.6
SVC Resection/Reconstruction	0	0
Vertebral Resection	1	0.5
Unknown	19	9.9
Total	192	100

Proporção de CTVA em todas as ressecções pulmonares

CTVA	Procedimentos	%
Não	1730	52
Sim	1578	47.5
Desconhecido	16	0.5
Total	3324	100

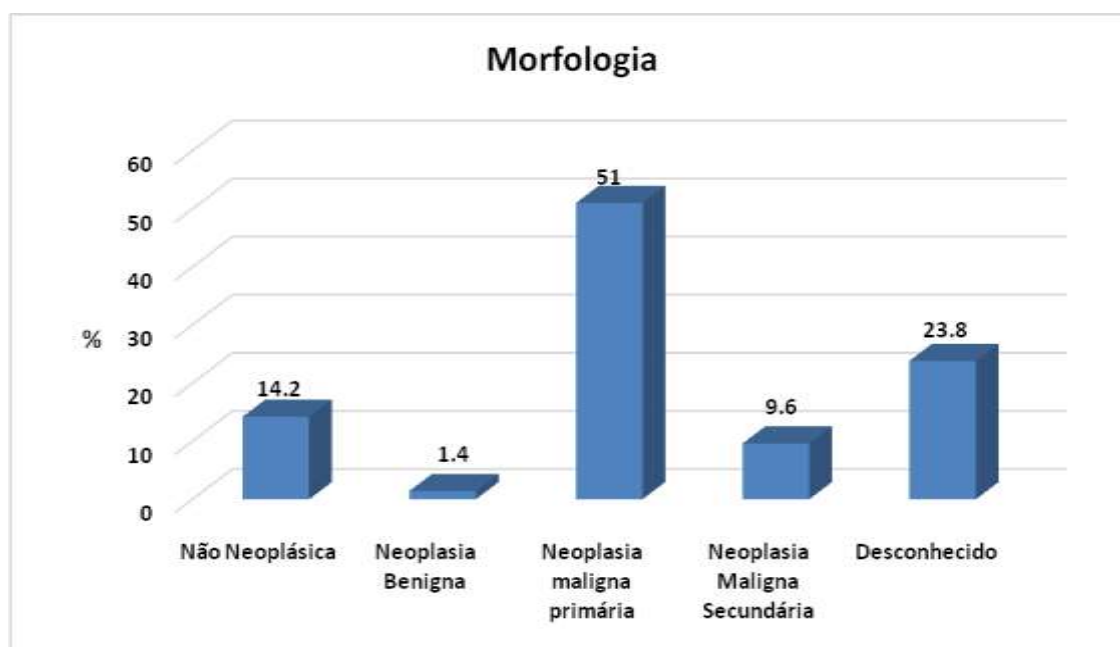


Proporção de lobectomias por CTVA

CTVA (lobectomia)	Procedimentos	%
Não	1039	52
Sim	953	47.6
Desconhecido	8	0.4
Total	2000	100

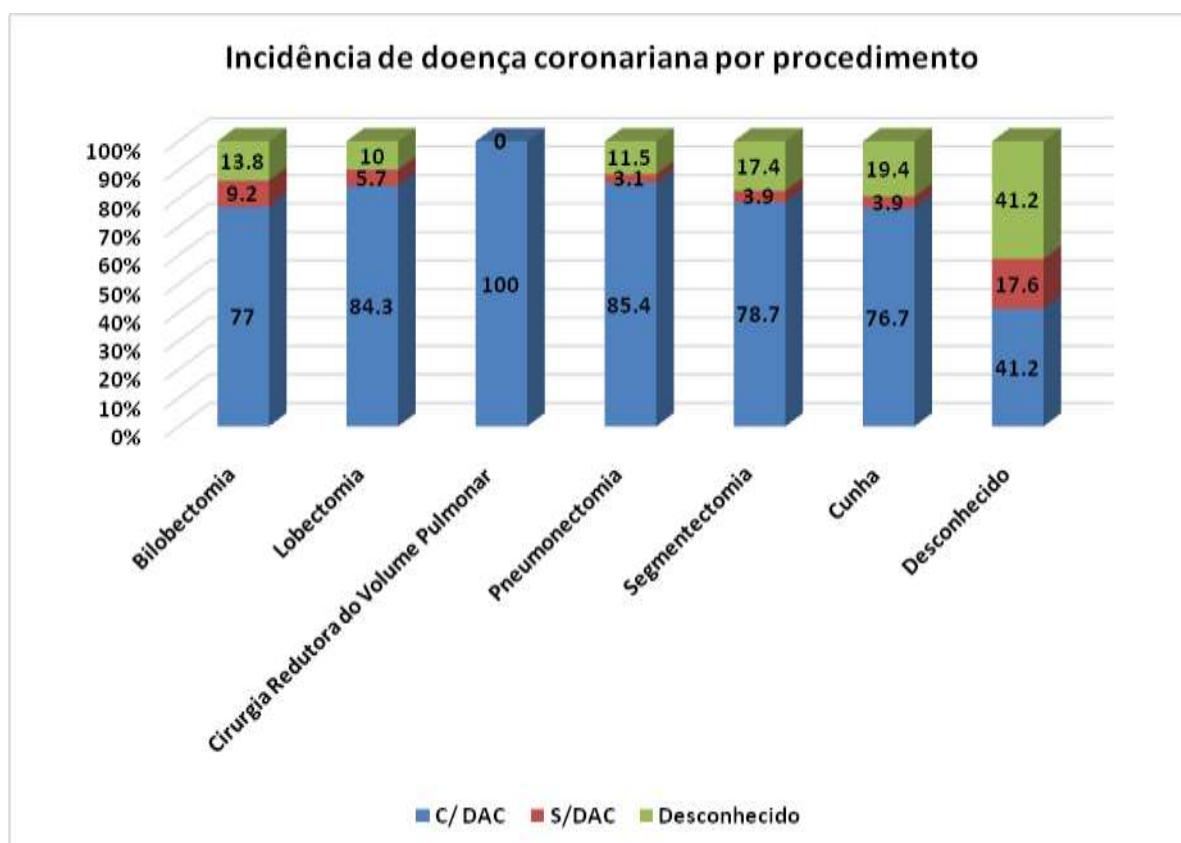
Patologia das ressecções pulmonares

Morfologia	Procedimentos	%
Não Neoplásica	472	14.2
Neoplasia Benigna	45	1.4
Neoplasia maligna primária	1697	51
Neoplasia Maligna Secundária	318	9.6
Desconhecido	792	23.8
Total	3324	100



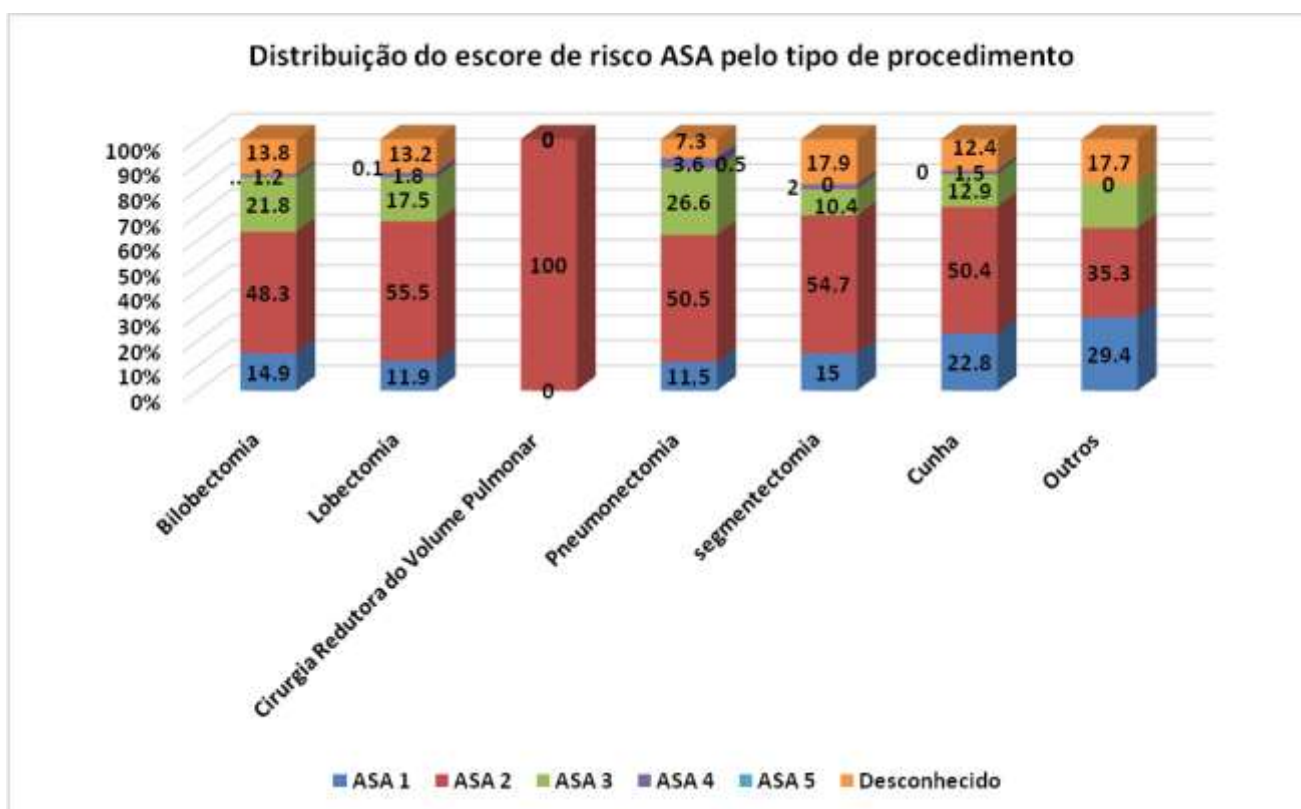
Incidência de doença coronariana por procedimento

Procedimento de excisão pulmonar	C/DAC	S/DAC	Desconhecido	Total
Bilobectomia	67	8	12	87
Lobectomia	1686	114	200	2000
Cirurgia Redutora do Volume Pulmonar	2	0	0	2
Pneumonectomia	164	6	22	192
Segmentectomia	325	16	72	413
Cunha	470	24	119	613
Desconhecido	7	3	7	17
Total	2721	171	432	3324



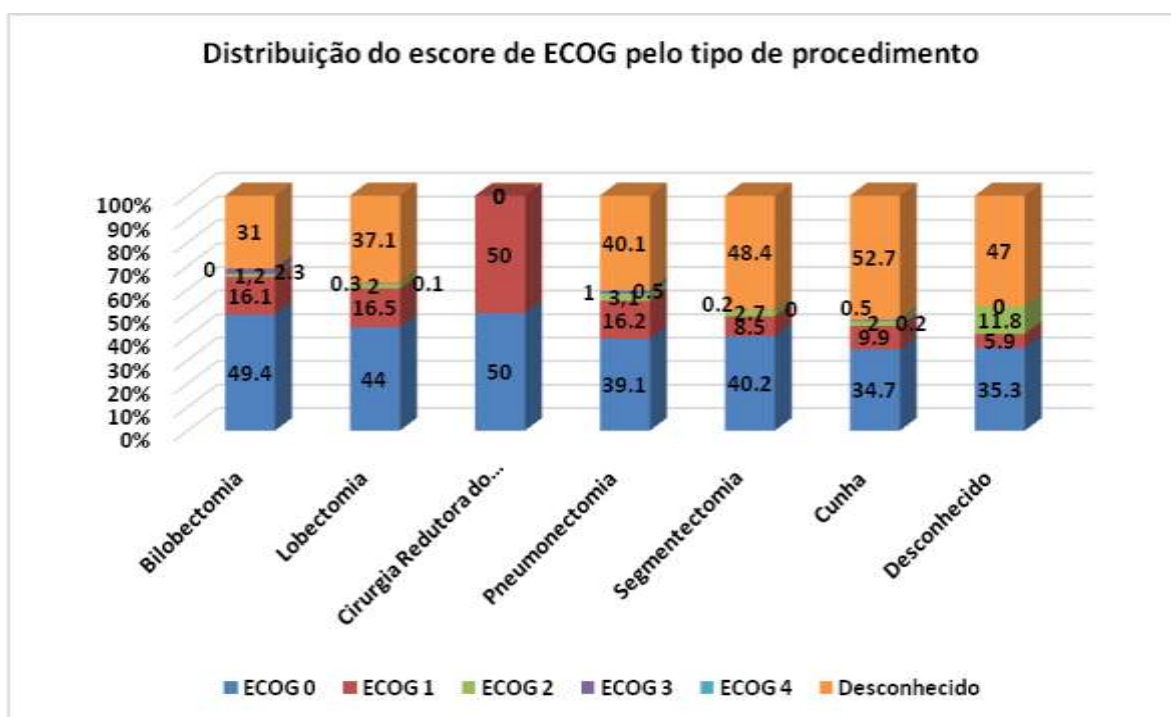
Distribuição do escore de risco ASA pelo tipo de procedimento

Tipo de ressecção pulmonar	ASA 1	ASA 2	ASA 3	ASA 4	ASA 5	Desconhecido	Total
Bilobectomia	13	42	19	1	0	12	87
Lobectomia	239	1110	350	36	1	264	2000
Cirurgia Redutora do Volume Pulmonar	0	2	0	0	0	0	2
Pneumonectomia segmentectomia	22	97	51	7	1	14	192
Cunha	62	226	43	8	0	74	413
Outros	140	309	79	9	0	76	613
Outros	5	6	3	0	0	3	17
Total	481	1792	545	61	2	443	3324



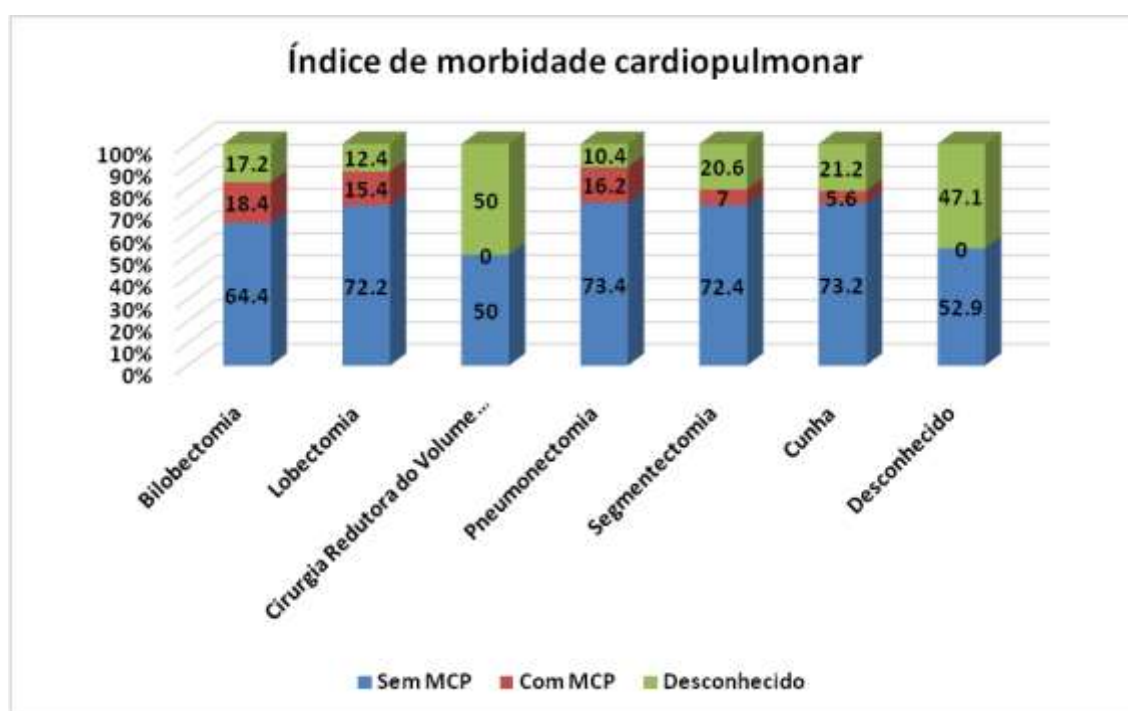
Distribuição do escore de ECOG pelo tipo de procedimento

Tipo de ressecção pulmonar	ECOG 0	ECOG 1	ECOG 2	ECOG 3	ECOG 4	Desconhecido	Total
Bilobectomia	43	14	1	2	0	27	87
Lobectomia	881	329	39	6	2	743	2000
Cirurgia Redutora do Volume Pulmonar	1	1	0	0	0	0	2
Pneumonectomia	75	31	6	2	1	77	192
Segmentectomia	166	35	11	1	0	200	413
Cunha	213	61	12	3	1	323	613
Desconhecido	6	1	2	0	0	8	17
Total	1385	472	71	14	4	1378	3324



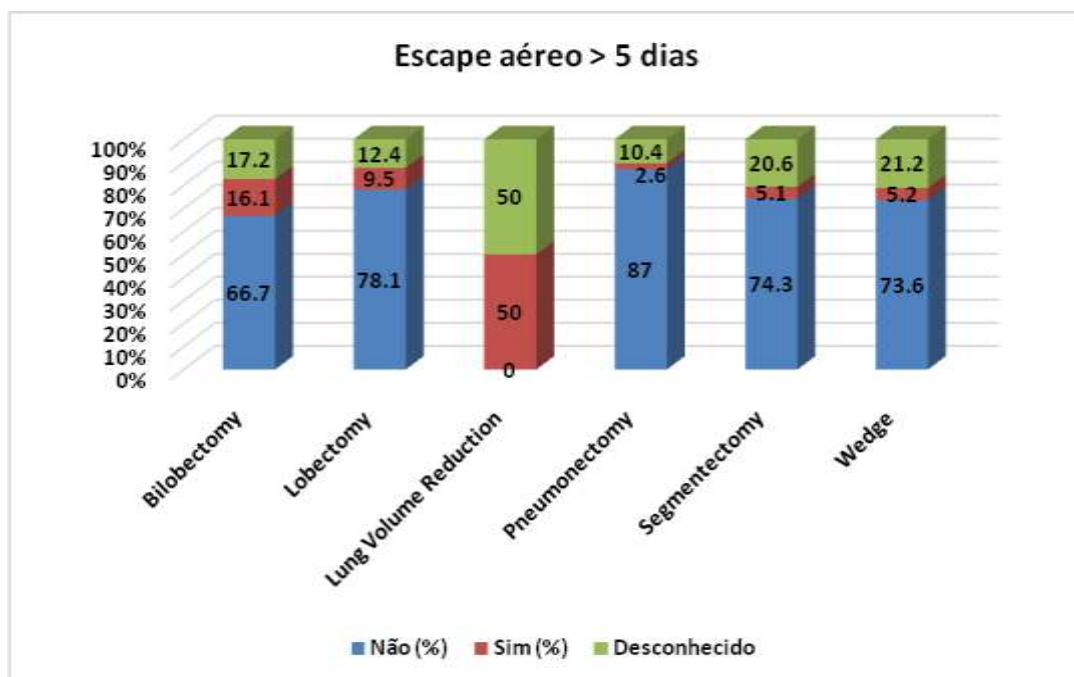
Índice de morbilidade cardiopulmonar (MCP) nos diferentes tipos de ressecções pulmonares

	Sem MCP	Sem MCP (%)	Com MCP	Com MCP (%)	Desconhecido	Desconhecido (%)	Total
Bilobectomia	56	64.4	16	18.4	15	17.2	87
Lobectomia	1443	72.2	309	15.4	248	12.4	2000
Cirurgia Redutora do Volume Pulmonar	1	50	0	0	1	50	2
Pneumonectomia	141	73.4	31	16.2	20	10.4	192
Segmentectomia	299	72.4	29	7	85	20.6	413
Cunha	449	73.2	34	5.6	130	21.2	613
Desconhecido	9	52.9	0	0	8	47.1	17
Total	2398		419		507		3324



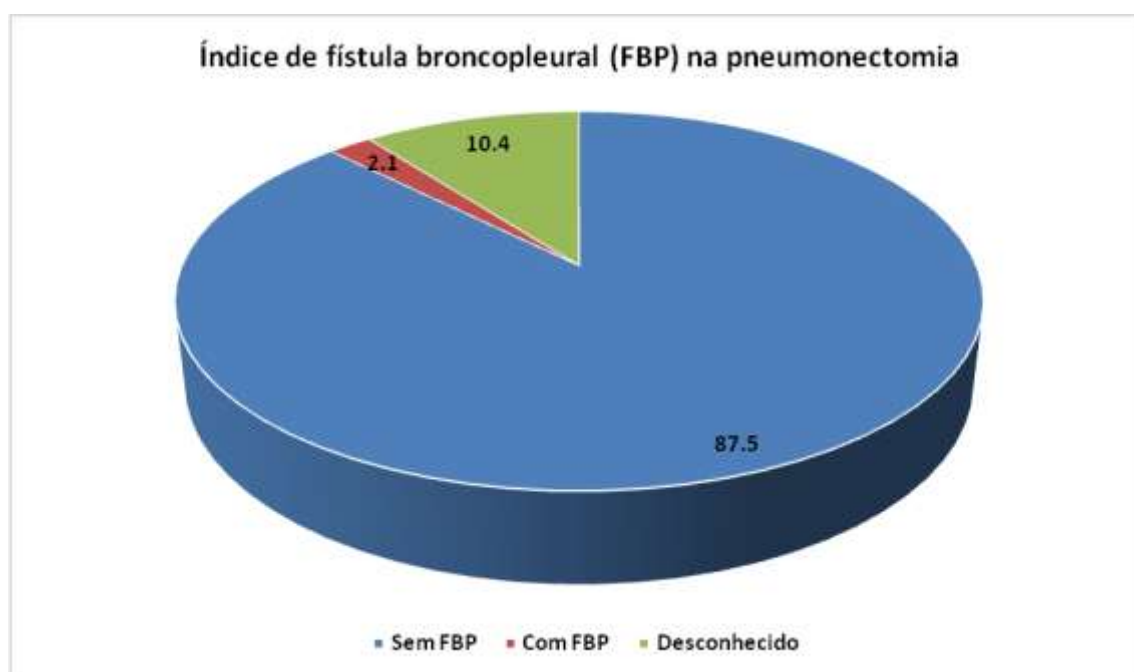
Índice de escape aéreo prolongado (> 5 dias) nos diferentes tipos de ressecções pulmonares

Tipo de ressecção pulmonar	Escape aéreo > 5 dias		
	Não (%)	Sim (%)	Desconhecido (%)
Bilobectomia	66.7	16.1	17.2
Lobectomia	78.1	9.5	12.4
Cirurgia Redutora do Volume Pulmonar	0	50	50
Pneumonectomia	87	2.6	10.4
Segmentectomia	74.3	5.1	20.6
Cunha	73.6	5.2	21.2
Total	76.8	7.9	15.3



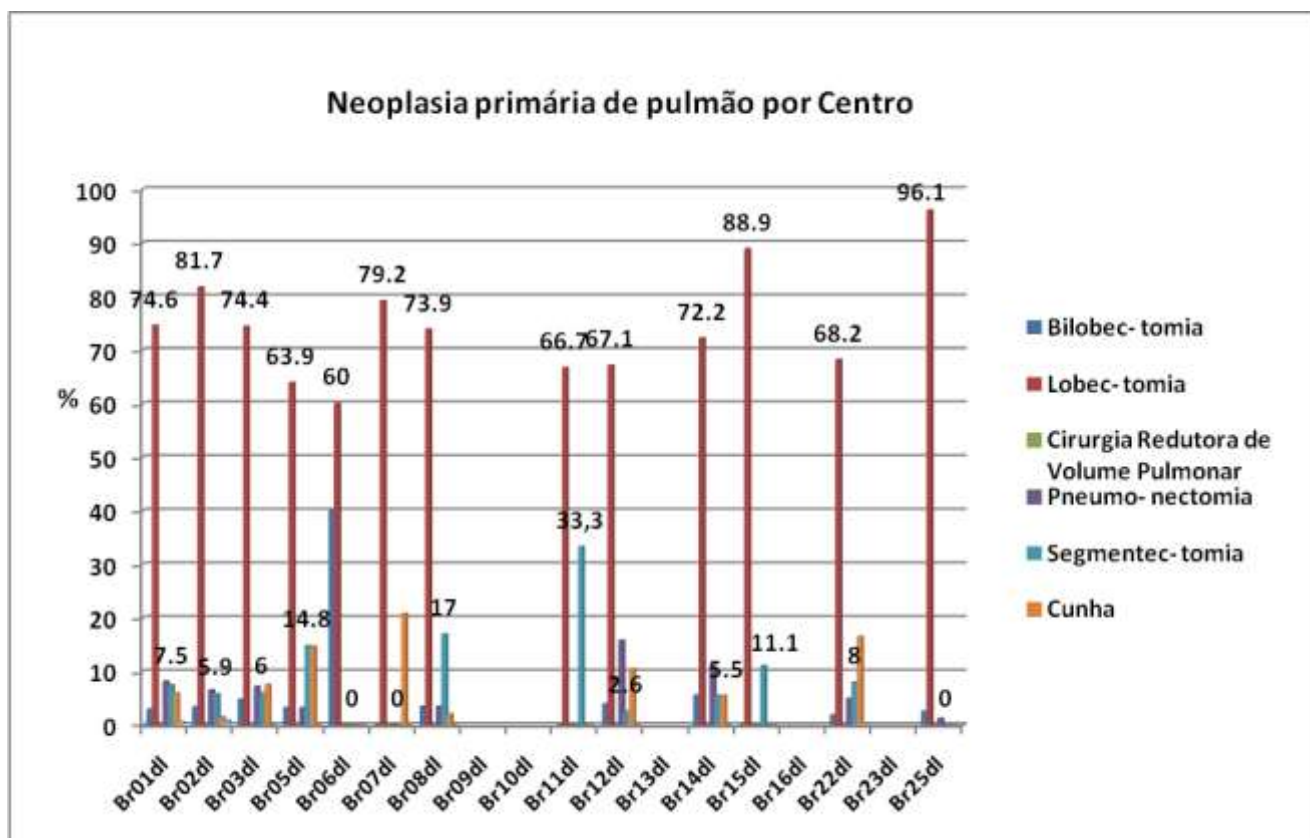
Índice de fístula broncopleural (FBP) na pneumonectomia

Fístula broncopleural	Sem FBP	Com FBP	Desconhecido
Pneumonectomia	168	4	20
Pneumonectomia (%)	87.5	2.1	10.4



Neoplasia primária de pulmão por Centro

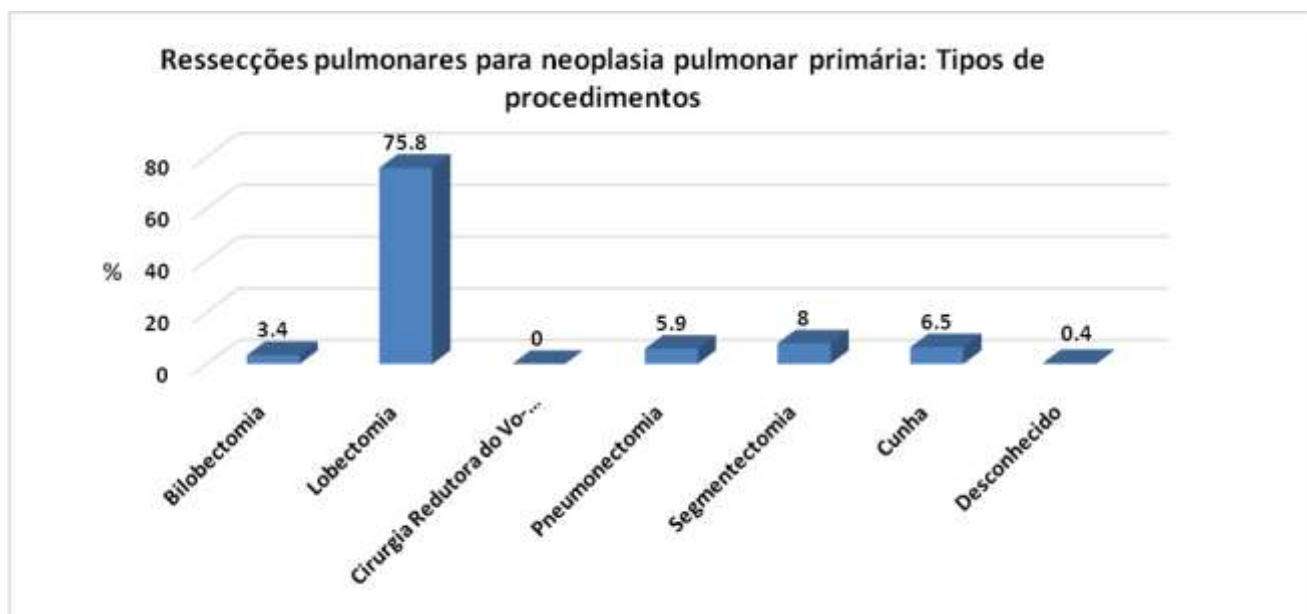
Unit	Total	Cirurgia Redutora de						
		Bilobec- tomia	Lobec- tomia	Volume Pulmonar	Pneumo- nectomia	Segmentec- tomia	Cunha	Desconhecido
Br01dl	134	3	74.6	0	8.2	7.5	6	0.7
Br02dl	471	3.4	81.7	0	6.6	5.9	1.5	0.9
Br03dl	250	4.8	74.4	0	7.2	6	7.6	0
Br05dl	61	3.3	63.9	0	3.3	14.8	14.7	0
Br06dl	5	40	60	0	0	0	0	0
Br07dl	48	0	79.2	0	0	0	20.8	0
Br08dl	283	3.5	73.9	0	3.5	17	2.1	0
Br09dl								
Br10dl								
Br11dl	3	0	66.7	0	0	33.3	0	0
Br12dl	76	4	67.1	0	15.8	2.6	10.5	0
Br13dl								
Br14dl	18	5.6	72.2	0	11.1	5.5	5.6	0
Br15dl	9	0	88.9	0	0	11.1	0	0
Br16dl								
Br22dl	261	1.9	68.2	0	5	8	16.5	0.4
Br23dl								
Br25dl	78	2.6	96.1	0	1.3	0	0	0
Total	1697	3.4	75.8	0	5.9	8	6.5	0.4



Neoplasia primária de pulmão

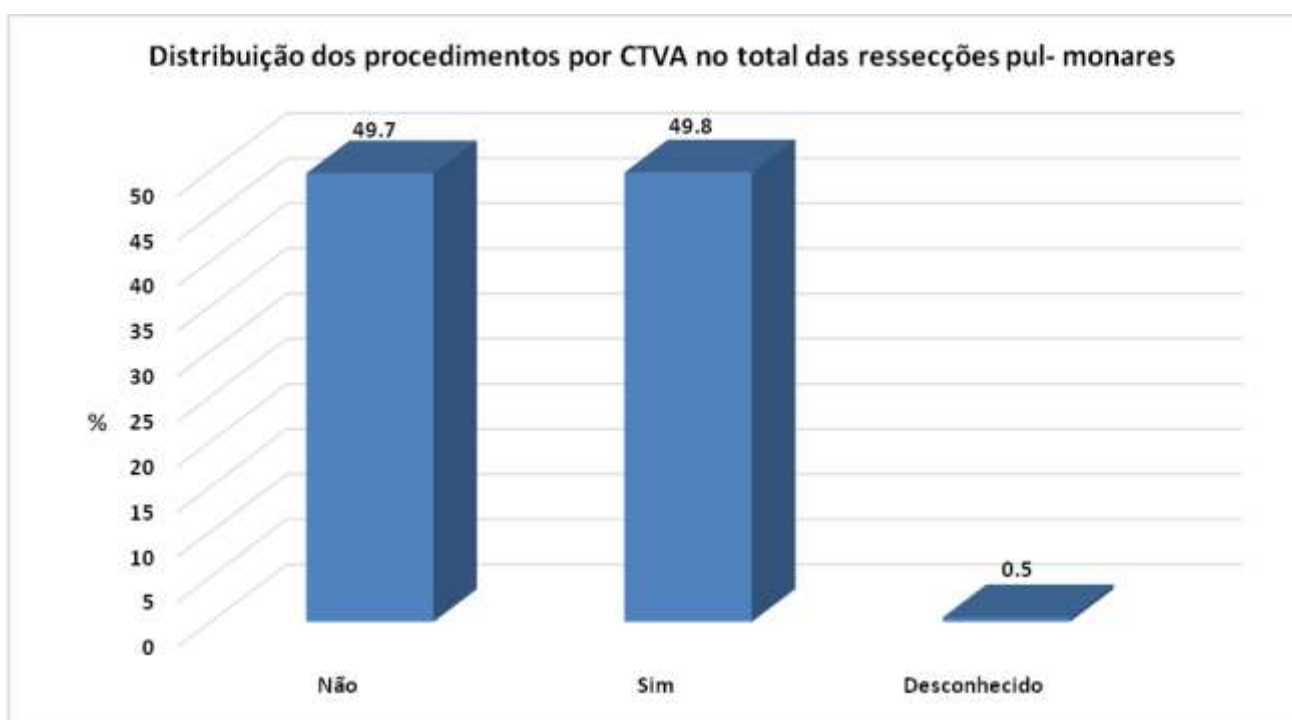
Ressecções pulmonares para neoplasia pulmonar primária: Tipos de procedimentos

	Procedimentos	%
Bilobectomia	57	3.4
Lobectomia	1287	75.8
Cirurgia Redutora do Vo- lume Pulmonar	0	0
Pneumnectomia	100	5.9
Segmentectomia	136	8
Cunha	111	6.5
Desconhecido	6	0.4
Total	1697	100



Distribuição dos procedimentos por CTVA no total das ressecções pulmonares

CTVA	Procedimentos	%
Não	844	49.7
Sim	845	49.8
Desconhecido	8	0.5
Total	1697	100



Distribuição dos procedimentos por CTVA nas lobectomias/bilobectomias

CTVA	Procedimentos	%
Não	678	50.4
Sim	662	49.3
Desconhecido	4	0.3
Total	1344	100

Índice de mortalidade hospitalar não ajustado por ressecções pulmonares para neoplasia pulmonar primária

Tipo de ressecção Pulmonar	N	Óbito Hospitalar	%
Bilobectomia	54	2	3.7
Lobectomia	1263	37	2.9
Cirurgia Redutora do Volume Pulmonar	0	0	0
Pneumonectomia	97	12	12.4
Segmentectomia	134	2	1.5
Cunha	108	4	3.7
Total	1656	57	3.4



Powerd by





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*Presidente del Giurì di Autodisciplina
per direct marketing, telemarketing, vendite a distanza e dirette*

K Data Clinical S.r.l.
Via Orazio, 31
00193 Roma

Milan, 23th May 2018

RE: assessment of the legal compliance of the personal data processing management procedures pursuant to the current legislation on the protection of personal data and certification of the correct implementation of EU Regulation 2016/679 (General Data Protection regulation - GDPR).

To K Data Klinical

with reference to the requirements established by the current legislation on personal data, as of today I have been able to carry out the necessary checks on the procedures and documentation used by you for the management of the charges imposed on the data controller to allow the adjustment of the processing of personal data to the EU Regulation 2016/679 (General regulation for the protection of personal data - the so-called GDPR).

This verification involved all the activities of data processing of your company.

The plan allowed to develop the following activities:

- 1) mapping of personal data processed
- 2) definition of the first version of the treatment register

1

- 3) evaluation of the review of the roles of data processing, including the decision to proceed with the appointment of a data protection officer (Data Protection Officer) and definition of the document appointing the parties authorized to process data
- 4) review of the information to be provided to data subjects for data processing
- 5) review of data processing activities against suppliers and definition of treatment processes
- 6) preliminary assessment of the treatments and risk analysis in relation to the need to carry out the impact assessment in the processing of personal data
- 7) analysis of the evaluation processes of the adequacy of the technical and organizational security measures adopted for data processing
- 8) definition of the processes necessary to guarantee the adoption of data protection processes through design (privacy by design) and protection by default (privacy by default)
- 9) definition of processes for handling the notification obligation for data breaches (data breach notification)
- 10) definition of the criteria for the conservation of personal data

By carrying out these checks, I have been able to review the treatment procedures already adopted by you and verify the minimum IT security measures with the subjects you use for the provision of IT services. This verification required the implementation of an adjustment plan that is described in the document attached to this declaration (Annex 1).

As a result of this verification I can acknowledge that the Holder, in order to prepare the documentation useful to certify the adoption of security measures suitable to prevent the illegal processing of personal data to be placed, has correctly carried out the adjustment activity to the EU Regulation 2016/679 and to proceed with updating the formalities required by the aforementioned legislation.

At the end of this review I can issue an opinion of full compliance of the processing processes with respect to the rules of the current legislation on the processing of personal data in the framework of EU Regulation 2016/679 for all companies in your Group.

Feel free to contact me to ensure the continuation of the adaptation and updating process and of your organizational procedures with respect to the frequent innovations that characterize this delicate subject, taking into account in particular the new rules introduced by the General Regulations for the protection of personal data (2016 / 679) will require a further implementation process after the date of full application of the same Regulation with effect from 25 May 2018.

Best regards.

Avv. Marco Maglio



Attachment- GDPR How to approach the change

