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## Original Article

## Analysis of the Current Situation and Outlook of Thoracic Surgery

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### ABSTRACT

**Objective:** The objective of this descriptive study was to analyze the current situation and forecast the future requirements for specialists in thoracic surgery, taking into account the number of doctors entering and those possibly leaving this specialty.

**Material and methods:** The data for this study were taken from the Spanish Society of Pulmonology and Thoracic Surgery (SEPAR) (n=304), Thoracic Surgeons' Club (n=122), and the Spanish Council of Medical Associations (n=225). We also took into account the current number of resident surgeons (n=84). Other specialists were included who are not recorded in these databases but who are known to be practicing (n=10). The total number of practicing specialists obtained was 211.

**Results:** There are currently 52 working thoracic surgery departments and the highest number of practicing specialists was recorded in Madrid (n=44), Catalonia (n=33), and Andalusia (n=33). The forecast number of retirements (at age 65 years) and incorporations of new specialists means that there will be a surplus of 57 thoracic surgeons in the next 5 years.

**Conclusions:** Thoracic surgery needs to limit the intake of new trainee specialists for at least the next 5 years.

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## Análisis de la situación actual y previsión de futuro de la especialidad de cirugía torácica

### RESUMEN

**Introducción:** Con objeto de analizar la situación actual y realizar una previsión de futuro de las necesidades de especialistas de cirugía torácica, se ha llevado a cabo un estudio descriptivo teniendo en cuenta las incorporaciones y posibles salidas del sistema de médicos de esta especialidad.

**Material y métodos:** Como base de datos se han tomado las de la Sociedad Española de Neumología y Cirugía Torácica (n = 304), Club de Cirujanos Torácicos (n = 122) y Consejo Español de Colegios de Médicos (n = 225). También se ha considerado el número actual de médicos residentes (n = 84). Se han añadido otros

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especialistas no censados en esta base de datos de los que se tiene constancia de su ejercicio ( $n = 10$ ). El total de especialistas en ejercicio considerados ha sido de 211.

**Resultados:** Actualmente hay 52 unidades de cirugía torácica con actividad y el mayor número de especialistas activos se registra en Madrid ( $n = 44$ ), Cataluña ( $n = 33$ ) y Andalucía ( $n = 33$ ). La previsión de jubilaciones (edad de 65 años) y nuevas incorporaciones de médicos especialistas hace que se prevea un excedente de cirujanos torácicos de 57 en los próximos 5 años.

**Conclusiones:** La especialidad de cirugía torácica debería moderar su oferta de formación de nuevos especialistas en los próximos 5 años como mínimo.

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## Introduction

Knowledge of the workload of a medical specialty and the number of specialists working in it is essential for analyzing not only the current situation but also future provisions for the specialty.<sup>1</sup> Few studies of this type have been carried out in thoracic surgery.<sup>2</sup> Several current circumstances suggest that such a study should be performed.

Thoracic surgery was created as a specialty in Spain by the Royal Decree 1014/1978, published in the Official Gazette of the Spanish Government of 29 July 1978, and so, as a specialty in its own right, it is barely 30 years old. The practice of thoracic surgery predates this though, and was born of 2 specialties: pulmonology and general surgery. This has led to a close relationship between those 2 specialties and, indeed, the scientific society that represents our specialty, the Spanish Society of Pulmonology and Thoracic Surgery (SEPAR), also represents the former of the 2. There is also a close relationship with general surgery, which is why a large number of thoracic surgeons belong to the Spanish Association of Surgeons.

A large number of social and demographic changes are currently under way, affecting all areas of Spanish society. When calculating the need for surgeons, it is necessary to take into consideration our European context and the large influx of immigrants causing considerable growth in the population and, at the same time, bringing many foreign surgeons who have decided to work in Spain. Furthermore, the current situations and the forecasts appear to indicate a certain shortage of doctors, who are often poorly distributed.

This study aims to analyze the current state of the specialty in terms of thoracic surgery departments that treat patients and the number of specialists. It also aims to analyze provisions for future demand and determine whether a surplus or shortfall of thoracic surgeons can be expected in the coming years.

## Materials and Methods

As there are no official registers of medical specialists, we have used data from different partial and complementary sources. Current Spanish legislation on data protection was respected at all times when requesting, classifying, and analyzing the data on specialists. We collected data on specialists and departments from the databases of SEPAR, the Spanish Thoracic Surgeons' Club, and the Spanish Council of Medical Associations, and from information provided by the Spanish Ministry of Health and Consumer Affairs. We also collected information from the different thoracic surgery departments, when this was deemed appropriate. We have tried to eliminate bias due to overestimates (doctors not working in the specialty, foreign doctors affiliated with scientific societies but who reside outside Spain, and medical association members with several qualifications, of which thoracic surgery is not the main one) and missing data (doctors who are not association members or not affiliated with the scientific societies consulted).

The SEPAR database was an essential source and contains 304 members who are thoracic surgeons. Of these, 48 were excluded: 28

retired members (over 65 years of age), 12 foreign members who do not work in Spain, and 8 who do not work as thoracic surgeons. The database of the Thoracic Surgeons' Club contains 122 members, of whom 18 were excluded (12 retired or deceased, 2 who do not work as thoracic surgeons, and 2 foreign members). The database of the Council of Medical Associations contains 225 members qualified in thoracic surgery. Of these members, 54 were excluded (32 retired doctors and 22 doctors who do not work as thoracic surgeons or for whom it is not the main specialty). After reconciling the data from these 3 databases, we added a small number of thoracic surgeons who were not registered in any of them, but who were known to be working in thoracic surgery departments.

## Statistical Analysis

The descriptive data are presented as mean (SD) and range for the continuous variables, and the qualitative data are shown as absolute and relative frequencies. We took 65 years as the retirement age and calculated the number of surgeons who will retire in the coming years. These figures were compared with the number of resident doctors who will finish their specialist training each year, in order to determine the surplus or shortage of thoracic surgeons in 5 years (2012) compared to current levels.

## Results

The main database was that of SEPAR, containing 304 registered thoracic surgeons. The total number of thoracic surgeons from this database who were considered to be valid for this study was 256, with a mean (SD) age of 44.2 (11.9) years and a range of 26-65 years (retirement age was taken to be 65 years, though some surgeons do not retire until the age of 70). The final number of thoracic surgeons affiliated with SEPAR is 201, after discarding 55 resident doctors who also belong to the society. Ten thoracic surgeons who were not found in the database were added to this figure of 201, giving a final figure of 211 (Table).

Figure 1 shows the population pyramid for thoracic surgeons affiliated with SEPAR. There are currently 48 women. The ratio of women to men obtained in this study is 0.18.

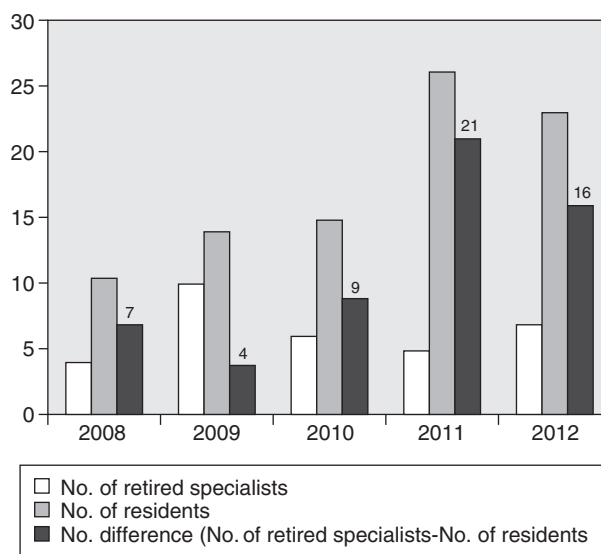
## Geographic Distribution

The Table shows the total number of thoracic surgeons, resident doctors, and departments currently in Spain. There are 84 resident doctors, who are distributed very unevenly among the autonomous communities, with Catalonia ( $n=19$ ), Andalusia ( $n=16$ ), and Madrid ( $n=14$ ) making up more than half of the total. A similar circumstance is apparent for the number of thoracic surgeons. Madrid has the highest number ( $n=44$ ), followed by Andalusia and Catalonia, with 33 each. These 3 autonomous communities total 110 specialists—more than half of all the thoracic surgeons. The number of current departments shows a similar pattern: Madrid and Catalonia have 10, Andalusia has 6, Valencia has 5, and the Canary Islands have 4.

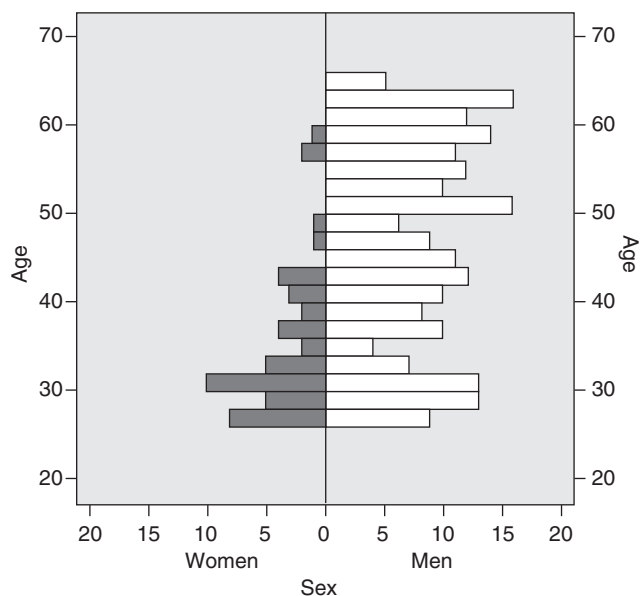
**Table 1**  
Distribution of Thoracic Surgeons, Resident Doctors, and Thoracic Surgery Departments by Autonomous Community, 2007

Autonomous Community	Thoracic Surgeons	Resident Doctors	Departments	Inhabitants, Millions <sup>a</sup>
Andalusia	33	16	6	7.95
Aragon	5	4	1	1.28
Asturias	4	3	1	1.08
Balearic Islands	4		1	1.00
Canary Islands	13	2	4	2.00
Cantabria	5	3	1	0.57
Castile and León	13	3	2	2.52
Castile-La Mancha	3		1	1.93
Catalonia	33	19	10	7.13
Extremadura	4		1	1.09
Galicia	13	6	3	2.76
Madrid	44	14	10	6.00
Murcia	4		1	1.37
Navarre	3		2	0.60
La Rioja	2		1	0.30
Valencia	20	9	5	4.81
Basque Country	8	5	2	2.13
<b>Total</b>	<b>211</b>	<b>84</b>	<b>52</b>	<b>44.7</b>

<sup>a</sup>Data from the Spanish National Institute of Statistics, 2007



**Figure 2.** Forecast retirements for the coming years and incorporation of new specialists from the intern and resident doctor training program in thoracic surgery.



**Figure 1.** Population pyramid of thoracic surgeons affiliated with the Spanish Society of Pulmonology and Thoracic Surgery (SEPAR).

*Demographic Changes*

Here, we analyze the forecast retirements for the coming years and the incorporation of new specialists from the intern and resident training program in thoracic surgery. Figure 2 shows a bar chart of the forecasts for the next 5 years. The chart shows that there will be a considerable surplus of specialists, peaking in 2011 and 2012. A surplus of 16 specialists is expected in 2012, in addition to the 21 surplus surgeons from the previous year; this will produce a surplus of 37 specialists in 2 years. The total surplus for the 5 years will be 57.

The growth in the number of specialists from other sources was very small. In recent years, the qualification of thoracic surgeon has been granted via Specialist Doctors Without an Official Spanish Qualification (Médicos Especialistas sin Título Oficial, MESTO) on 2 occasions and via recognition of foreign qualifications on 3 occasions.

*Teaching and Research*

According to the SEPAR database, 72 thoracic surgeons hold a doctorate degree, representing 36% of all registered specialists. As these data may not be up-to-date, this figure may be somewhat lower than the real figure. Moreover, there are 4 university professors (one retired from active practice and the other an emeritus professor) and 6 associate professors; the number of doctors with civil service positions is therefore very low (4%). There are 34 (17%) assistant professors and 16 (8%) with other affiliations. The total number of thoracic surgeons involved in teaching is, therefore, 54 (27%).

**Discussion**

Achieving the necessary number of doctors in the different specialties requires thorough planning in accordance with market requirements and administrative oversight by the government.<sup>1</sup> Few studies in Spain have dealt with this topic, either for the medical profession as a whole or by specialty.<sup>3-5</sup> A study was published in the area of pulmonology and thoracic surgery in 2002 but had little repercussion.<sup>2</sup>

One of the basic objectives of this study was to determine whether the number of currently practicing thoracic surgeons in Spain is sufficient. However, it is difficult to establish comparisons with other countries, even neighboring countries, as there are no relevant data available and because health care systems often have structures and organizations that are very different from the Spanish system, as in the case of the United States.<sup>1</sup> In some countries, thoracic surgery is carried out within the specialties of general surgery and cardiothoracic surgery. There are also some problems with definitions of the specialties. Cardiovascular surgery, for example, is only recognized under this name in Spain. In the rest of the European Union, with the exception of the Netherlands, Denmark, and Austria, it is included in the specialty of thoracic surgery.<sup>6</sup> This lack of uniformity in the specialty in Europe has been cited as an important problem when defining the resources that should be dedicated to thoracic surgery, though an attempt has been made to define them in a joint study by the European scientific societies.<sup>7</sup> Relevant data include the volume of operations carried out, which is linked to the number of active thoracic surgeons and departments. Some studies have reported better results in operations performed by thoracic surgeons compared to those performed by nonspecialist surgeons, particularly in

operations with a higher risk.<sup>8,9</sup> A greater number of operations has been linked to a lower incidence of complications and a higher survival rate,<sup>9</sup> though this fact is not clear from other studies.<sup>10</sup>

Thoracic surgery is mostly performed in public hospitals; private practice is rare. To date, immigration of thoracic surgeons from other countries is also rare. The specialty is provided, almost exclusively, in tertiary-care reference hospitals, making the availability of new jobs highly restricted and inflexible. This situation has been strongly affected by the development of health care competencies in the autonomous communities and by the constant growth of the Spanish population.

The treatment of lung cancer constitutes a large part of the specialty and no changes are expected in the surgical workload due to this tumor in the coming years. The incidence of this disease, however, is showing a downward trend, particularly in the male population.<sup>11</sup> It would also appear that the workload due to other procedures in thoracic surgery will not undergo major changes.

A thoracic surgery department with 5 surgeons for every million inhabitants is probably a suitable figure. Given that the Spanish population is 45 million, there should be approximately 45 departments and between 200 and 240 specialists. This study shows that these figures are very close to current figures. We counted 52 departments, 211 practicing specialists, and 84 trainee specialists. The problem lies in the geographic distribution, which is highly uneven, with a surplus of resources in some regions and a deficit in others. An important failing is the lack of departments and specialists in Andalusia. It is also possible that thoracic surgery is poorly implemented in Extremadura and Castile-La Mancha. In general, the distribution of departments is uneven and there are, logically, no objective geographic distribution criteria due to the particular characteristics of our health care system. The surplus of departments is not only found in the autonomous communities of Madrid and Catalonia; other communities with a relatively low population also have surplus departments. Of particular note are the Canary Islands, with a population of 2 million inhabitants and 4 departments, and La Rioja, with a little over 300 000 inhabitants and 1 department. This situation appears difficult to resolve due to the particular characteristics of the Spanish system, with transfer of health care competencies to the autonomous communities.

Entries into the system, that is, the incorporation of new specialists, come mainly through admission to the intern and resident doctor training program. Thoracic surgery has expanded considerably within this program, with growth rates of 28% from 2004 to 2005 and 77% from 2002 to 2005.<sup>1</sup> Our data reveal the important fact that there will be a net growth of 57 specialists by

2012 when new incorporations and retirements are taken into consideration. Other incorporations into the system (recognition of foreign qualifications and MESTO) are of little significance in thoracic surgery. These data support those of the study by González López-Valcarcel and Barber,<sup>1</sup> who found that thoracic surgery is one of the fastest-growing specialties.

In conclusion, thoracic surgery is unevenly distributed throughout Spain. Nevertheless, there is a slight tendency toward a surplus of specialists, which will become more acute in the coming years with a large peak in 2011 and 2012. If this trend continues, there will be a considerable surplus of thoracic surgeons by 2020. Furthermore, there is a lack of departments in some regions of Spain, such as Andalusia and Castile-La Mancha, while other communities, such as Madrid, Catalonia, and the Canary Islands have a surplus. Finally, the number of trainee residents beginning training in thoracic surgery should be moderated.

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