

ORIGINAL PAPERS

## Gastroenterology - Evolution of specialty choice in recent years

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### ABSTRACT

**Introduction:** Gastroenterology is one of the medical specialties offered to residency training candidates each year. This project analyzes the data associated with the choice of a Gastroenterology residency program in recent years.

**Material and methods:** Data related to specialty selection were obtained from official reports with regard to the allocation of residency places by the Spanish Ministry of Health, Social Services and Equality. Information was collected from various teaching centers via their training guides, the Spanish National Catalogue of Hospitals and the National Transplant Organization.

**Results:** The median consecutive number involved in the choice of Gastroenterology training has decreased year after year, and this specialty is now positioned among the five most commonly selected residency programs in 2015. The median number of hospitals with a higher number of beds, adult liver transplantation activities and dedicated GI bleeding units is significantly lower. This is also true when centers are analyzed according to the presence of specific Gastroenterology on-call shifts for residents or their association with medical schools. Data from the past five years highlight Madrid, Aragón and the Basque Country as the autonomous communities where Gastroenterology is the most popular. Centers selected by candidates with the lowest median consecutive numbers from 2011-2015 included the university hospitals Ramón y Cajal, Santiago de Compostela and Gregorio Marañón.

**Conclusions:** Gastroenterology has gradually escalated in the ranking of residency choices and is now one of the five most popular options. Potential residents prefer larger centers with complex-care patients and more research activity.

**Key words:** Gastroenterology. Specialization. Choice.

### INTRODUCTION

Gastroenterology deals with conditions involving the gut, including the esophagus, stomach, bowel, anorectal tract, liver, bile ducts, pancreas and peritoneum. This specialty addresses the etiology, epidemiology, pathophysiology, semiology, diagnosis, prognosis, prevention and management of gastrointestinal disease (1). A medical degree and a four-year-long specific training period

are required in order to practice Gastroenterology (2). To access this training program, candidates must pass a nation-wide MIR (internal medical resident) examination offered annually by the Spanish Ministry of Health, Social Services and Equality (MSSSI). Those who obtain a score above the cut-off mark are allocated a sequence number in order to compete for a residency place both in Gastroenterology and the rest of medical specialties (3). The higher the mark, the lower the sequential number. Number one represents the candidate who passed with the highest mark and who will have first choice of a specialty training place. Therefore, comparing data for several specialty choices or training centers will allow the assessment of the preference and popularity of a given specialty *versus* others among MIR accredited candidates for a given year. Specialty choice and place allocation organized during a yearly MSSSI meeting and the proceedings are made accessible to the public. Gastroenterology is among the specialties offered on a yearly basis to physicians passing the MIR exam. The present paper aims to discuss supply and demand related to this specialty in recent years and to identify the most commonly requested autonomous communities and centers as those allocated lower consecutive numbers.

### MATERIAL AND METHODS

#### Information sources

Official data regarding the allocation of places by the MSSSI were collected from 2006 to 2015, the latter date corresponding to the allocations granted in 2016. Several sources were reviewed to obtain the characteristics of the training centers involved. The number of beds was obtained from the National Catalogue of Hospitals, published by the MSSSI (4). Adult liver transplantation activities in each center were obtained from the public reports by the National Transplant Organization (5). Information with regard to bleeding units, training in association with medical schools and on-call Gas-

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troenterology shifts for residents was collected from the “portfolio of services”, organizational chart and training guides available from each site (3). Furthermore, the presence of high-impact research, as defined by an H index above 39, was also analyzed based on the digital initiative *webcindario* (6).

**Statistical analysis**

As each specialty, Autonomous Community and center offers a different number of places, the number of places offered and the maximum, minimum, median and 25<sup>th</sup> and 75<sup>th</sup> percentile values are provided for each analysis. Median values were used to weight distribution asymmetries among the various comparisons performed, and non-parametric tests such as Wilcoxon’s, the Kruskal-Wallis test and Spearman’s correlation coefficient were applied. The statistical analysis was performed using the Stata 13.0 software.

**RESULTS**

A total of 1,372 Gastroenterology residency places were allocated from 2006 to 2015. The number of places offered annually ranged from a minimum of 115 in 2006 to a maximum of 148 in 2009. This number progressively increased until 2009 and then dropped to 139 in 2015 for all specialties.

From 2006 to 2015, the minimum sequence number for the selection of Gastroenterology was 1 and the maximum sequence number was 4,803. The median sequence number during this period was 1,578.5 with a mean of 1,612.3. When the analysis was restricted to the last five years, the median sequence number was 1,355 with a mean of 1,435.3. Figure 1 shows the annual evolution of the distribution of sequence numbers from 2006 until the last examination in 2015. The highest median number was obtained in 2007 with a value of 1,979, when 131 Gastroenterology training places were offered. The lowest median sequence

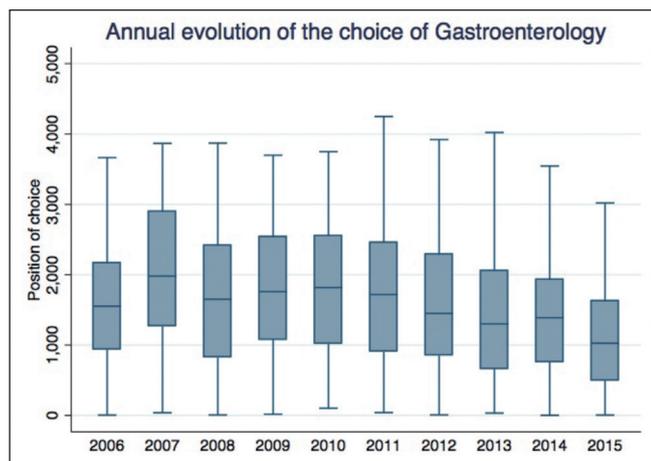


Fig. 1. Distribution of Gastroenterology choice-related sequential numbers by selection year.

number was obtained in 2015 with a value of 1,025 for a total of 139 residency places. The median value has decreased in the past few years, a fact not accounted for by the number of places on offer. This progressive annual decrease in the sequence numbers for the selection of Gastroenterology training had a Spearman’s correlation coefficient of -0.201 (p < 0.005).

With regard to the career choice in Gastroenterology over other specialties, Gastroenterology ranked 12<sup>th</sup> (median) according to the pooled data collected from 2006 to 2010, and ranked 7<sup>th</sup> during the period 2011-2015. In 2015, Gastroenterology ranked 5<sup>th</sup> among the 44 specialties on offer after Plastic Surgery, Dermatology, Cardiology and Neurology. However, 139 Gastroenterology places were offered in 2015 *versus* 78 in Dermatology, 35 in Plastic Surgery, 153 in Cardiology and 125 in Neurology programs. While the median sequence number for Plastic Surgery is lower than that for Gastroenterology, the last of the 35 Plastic Surgery places offered was assigned to the sequential number 1.154, whereas the last allocation in Gastroenterology was to the sequential number 1.145. The comparison with Neurology yields similar results. Figure 2 shows specialties in order of choice-related median sequence number in 2015.

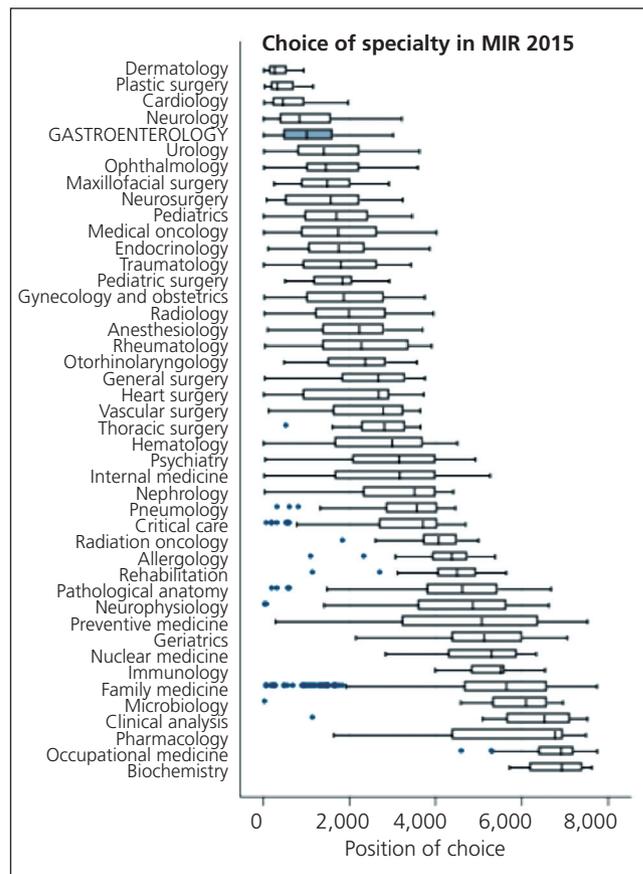


Fig. 2. A representation of all medical specialties offered in 2015, listed by median consecutive number.

With regard to the potential influence of hospitals where a previous conformity report is required, only the Navarra Clinical University offered these Gastroenterology places during this period. During the last ten years, the allocated post with the highest sequence number was associated with this hospital on four occasions. Nevertheless, the specialty ranking and its position relative to other career choices in Spain are no different following the exclusion of this site from the analysis.

With regard to potential trainees, the proportion of women choosing to pursue a career in Gastroenterology has oscillated between 59.7% and 79.3% during the study period. This figure was 59.7% in 2015, which represents the lowest proportion for the period under consideration. With regards to training center popularity according to complexity, hospitals' were stratified by the number of beds during the period from 2011 to 2015. The median sequence number involved in the selection of hospitals with over 1,000 beds was 854.5, which was significantly lower than for hospitals with 500 to 1,000 beds (1,369) and for hospitals with fewer than 500 beds (2,294) ( $p < 0.005$ ). Hospitals with adult liver transplantation units had a median of 756.6 whereas those without such units had a median sequence number of 1,798 ( $p < 0.005$ ). Hospitals with gastrointestinal bleeding units had a median of 833.5, and those without them had a median of 1,515 ( $p < 0.005$ ). Centers with specific Gastroenterology on-call shifts for residents had a median number of 854.5 *versus* 1,830 for those with no such shifts available ( $p < 0.005$ ). With regard to center popularity according to teaching and research activity, those associated with a medical school had a median number of 1,163.5 *versus* 2,252 for those without ( $p < 0.005$ ). Centers staffed by investigators with an H index above 39 had a median consecutive number of 841 during the study period, while those with no research activity had a median number of 1,459 ( $p < 0.005$ ).

According to the analysis by autonomous communities from 2011 to 2015, Madrid offered the highest number of Gastroenterology residency posts with a total of 154, representing 22.3%, followed by Andalusia with 103 (14.9%) and Catalonia with 101 (14.5%). In contrast, the communities that offered fewer Gastroenterology residency places included the Balearic Islands, Cantabria and Extremadura, with ten places each, and La Rioja, with only five places. Madrid had the lowest median sequence number involved in the career specialty choice according to the ranking by autonomous communities from 2011 to 2015, with 643.5, followed by Aragon with 870 and the Basque Country with 1,059. Table 1 lists all autonomous communities with the lowest and highest median number. In addition, the center enrolling the lowest sequence number in each community is also listed for the same period. The community and center data match each other in Cantabria and La Rioja as only one institution offered Gastroenterology residency places in these communities.

Table 2 shows the ten most commonly selected hospitals in Spain according to the pooled data from 2011 to 2015. The top three centers in the list include the university hospitals Ramón y Cajal, Santiago de Compostela, and Gregorio Marañón, with a median sequence number of 141, 221, and 227, respectively.

## DISCUSSION

Gastroenterology is an attractive career option for holders of the MIR qualification. The median sequence number of those who choose Gastroenterology has significantly decreased during the last few years, which suggests a growing interest in this specialty. In 2015, all candidates that chose Gastroenterology belonged to the so-called "stronger group", representing the 73<sup>th</sup> percentile of MIR qualified candidates according to the classification by the MSSSI (7). Furthermore, Gastroenterology is currently among the five specialties selected by those with lower sequential numbers. Females predominate over males, which has been reported during the past ten years. Data suggest an increased preference for larger sites with higher care complexity and both teaching and research activities. Significant differences are apparent in the median sequence numbers in the ranking by autonomous communities and centers. This suggests that certain preferences are relatively consistent among candidates.

The growing popularity of Gastroenterology as a career option may be accounted for by multiple factors that are currently transforming training, research and health care in the field of digestive diseases. The number of diagnostic and therapeutic techniques available for residency training is increasing, with an ever increasing number of centers that are highly skilled in these procedures. This is accompanied by an increase in the demand for specialist services for early cancer detection. The development of nationwide research platforms for gut and liver conditions (8) and the availability of newer therapies, including biologics and direct antiviral drugs, have all contributed to the increased value of Gastroenterology. Finally, low unemployment rates among newly-trained Gastroenterology specialists is significant (9), as there are good career prospects in both the public and private sectors. Bearing in mind the favorable outcome of choosing a career training in Gastroenterology and the potential appealing factors of this specialty, Gastroenterology is expected to maintain or have an increased choice impact over the next few years.

The above information represents an objective analysis of career choice in Gastroenterology-based medicine based on official MSSSI data and selected characteristics of training centers. We do not claim that this is an analysis of care or training quality within the sites involved, as this is assessed in other papers (10). Nor is it an assessment of resident satisfaction, which is also discussed in

**Table 1. Ranking of autonomous communities by median consecutive number using data from 2011 to 2015**

	<i>N</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>p25</i>	<i>Median</i>	<i>p75</i>
<i>Madrid</i>	154	824.7	1	2,515	294	643.5	1,144
U. H. Ramón y Cajal	20	154.9	1	404	40	141	246
<i>Aragón</i>	20	948	10	2,481	414.5	870	1,478
U. C. H. Lozano Blesa	10	501.6	10	1,036	83	568.6	851
<i>Basque Country</i>	39	1,193.6	174	3,291	694	1,059	1,563
U. H. Cruces	8	756	174	2,203	283	564	988.5
<i>Galicia</i>	26	1,207.9	146	2,691	610	1,083	1,726
U. H. C. Santiago de Compostela	5	653.2	146	1,726	183	221	990
<i>Cantabria</i>	10	1,337.1	603	2,457	696	1,154.5	2,248
U. H. Marqués de Valdecilla	10	1,337.1	603	2,457	696	1,154.5	2,248
<i>Navarra</i>	18	1,594.8	178	4,250	760	1,304	1,714
H. C. Navarra	10	1,025.5	178	1,714	760	1,012.5	1,328
<i>Valencia</i>	64	1,489.7	148	3,364	719.5	1,414.5	2,214
U.H. i Politècnic La Fe	15	560.8	148	930	338	584	854
<i>Murcia</i>	21	1,539	170	3,047	971	1,472	2,193
U.C.H. Virgen de la Arrixaca	10	1,060.9	331	1,890	714	1,084.5	1,394
<i>Catalonia</i>	101	1,527.1	16	3,444	966	1,515	2,024
H. Clínic Barcelona	15	706.5	16	1,293	150	837	1,088
<i>Castile and Leon</i>	39	1,746.3	63	3,475	1,029	1,562	2,447
U. H. Río Hortega	8	1,037.4	63	2,564	399	837.5	1,599.5
<i>Canary Islands</i>	20	1,815.3	138	3,494	965	1,621.5	2,424.5
H. Nuestra Sra. de la Candelaria	5	1,843.6	138	3,494	900	1,437	3,249
<i>Asturias</i>	22	1,671.3	116	3,286	1,070	1,734.5	2,288
U. H. Central de Asturias	13	1,310.3	116	2,091	806	1,433	1,805
<i>Andalusia</i>	103	1,688.9	32	3,732	1,036	1,741	2,176
U. H. Virgen del Rocío	13	864.5	300	1,490	684	738	1,008
<i>Extremadura</i>	10	2,233.7	1,201	3,253	1,948	2,237.5	2,561
U. H. C. Badajoz	5	1,877.2	1,201	2,561	1,417	1,984	2,223
<i>La Rioja</i>	5	2,281.4	1,649	2,793	2,013	2,467	2,485
H. San Pedro	5	2,281.4	1,649	2,793	2,013	2,467	2,485
<i>Castile-La Mancha</i>	29	2,488	1,025	3,920	1,999	2,484	3,186
U. H. Toledo	6	1,719.2	1,025	2,518	1,059	1,710	2,293
<i>Balearic Islands</i>	10	2,285.8	124	3,450	1,992	2,627.5	2,943
U. H. Son Llàtzer	5	2,213.6	124	3,450	1,992	2,559	2,943

The hospital with the lowest median number within each Autonomous Community for this period is listed. U. H. C.: University Hospital Complex; U. H.: University Hospital; U. C.: University Clinic; U. C. H.: University Clinic Hospital; N: Total number of places offered during the period; p25: 25<sup>th</sup> percentile; p75: 75<sup>th</sup> percentile.

other studies (11,12). Choosing a specialty and training center involves multiple subjective factors including the perceived prestige of the specialty, geographical preferences, etc. (13-15), which were not the goal of the present

analysis. However, this simple study provides evidence with regard to the growing interest in Gastroenterology and outlines the preferences that play a role in terms of geographic location and training center.

**Table 2. Ranking of all ten hospitals with the lowest median consecutive numbers for Gastroenterology residency choice, pooled data for the period from 2011-2015**

	<i>N</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>p25</i>	<i>Median</i>	<i>p75</i>
U. H. Ramón y Cajal	20	154.9	1	404	40	141	246
U. H. C. Santiago de Compostela	5	653.2	146	1,726	183	221	990
U. H. Gregorio Marañón	20	252.1	87	488	187.5	227	293
U. H. La Paz	15	497.5	239	807	302	482	634
U. H. La Princesa	15	553.1	279	927	317	556	732
U. H. Cruces	8	756	174	2,203	283	564	988.5
U. C. H. Lozano Blesa	10	501.6	10	1,036	83	568.6	851
U. H. i Politècnic La Fe	15	560.8	148	930	338	584	854
U. H. 12 de Octubre	15	578.9	263	899	414	594	730
U. C. Ourense	5	1,080.2	399	2235	548	610	1,609

U. H. C.: University Hospital Complex; U. H.: University Hospital; U. C.: University Clinic; U. C. H.: University Clinic Hospital; N: Total number of places offered during the period; p25: 25<sup>th</sup> percentile; p75: 75<sup>th</sup> percentile.

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