Report on the Status of dialysis and renal transplantation in Spain in 2005

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SUMMARY

In 2005, renal replace treatment (dialysis and transplant) was necessary for about 40,000 people, without being known the number accurate and either their basic characteristics, such as: time in treatment, modality or treatment changes. The presented data cover the 76% of the Spanish population and are the result of the cooperation among technicians of registries, nephrologists and transplant coordinations. 4,125 people started RRT in 2005, the total estimated acceptance rate for renal replacement therapy in adults in Spain was 126 pmp and regarding other European countries it locates us in an intermediate area. The incidence rate seems to keep stable in the last years although there were some differences among communities (from 104 pmp in Castile and Leon to 186 pmp in Canary Islands). Diabetes Mellitus is the most diagnosed cause of renal failure in 2005, more than 20% of patients, followed by vascular diseases. The estimated prevalence of renal replacement therapy in Spain at the end of 2005 was 903 pmp, with important variations among communities (from 806 pmp in Cantabria to 1,056 pmp in Valencia Region). The 47% of prevalent RRT patients had a functioning transplant. Mortality on haemodialysis and peritoneal dialysis was 13.7% and 10.8% respectively. Mortality on transplant was 1.3%, one of the lowest values registered so far. Mortality on renal replacement therapy was around 5% among patients from 45 to 64 years, 11% between 65 and 74 years and 19% among the patients older than 75 years.

Key words: *Prevalence rate. Incidence rate. Dialysis. Transplant.*

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RESUMEN

En 2005, el tratamiento renal sustitutivo (diálisis y trasplante) es necesario para unas 40.000 personas, sin que se conozca con precisión el número ni características básicas, tales como: el tiempo en tratamiento, la modalidad o los cambios de tratamiento. Los datos presentados cubren el 76% de la población española, resultado de la cooperación de los técnicos de registros, nefrólogos y coordinaciones de trasplante. La procedencia de datos de registros ha pasado de ser un 38% a un 76% en 2005. Durante 2005 iniciaron tratamiento sustitutivo 4.125 personas, lo que supone una incidencia de 126 pac/pmp y respecto a otros países europeos nos sitúa en una zona intermedia. La incidencia parece mantenerse estable en los últimos años si bien hay grandes diferencias entre comunidades (de 104 pac/pmp en Castilla y León a 186 pac/pmp en las Islas Canarias). La Diabetes es la causa de enfermedad renal primaria más diagnosticada en 2005, en más del 20% de los pacientes, seguida de las causas vasculares. España presenta una prevalencia de 903 pac/pmp, con grandes variaciones entre comunidades (de 806 pac/pmp en Cantabria a 1.056 pac/pmp en la Comunidad Valenciana). El 46,7% de los pacientes estudiados está trasplantado. La mortalidad en diálisis es del 13,7%, del 10,8 en diálisis peritoneal y del 1,3% en trasplante, siendo éste uno de los índices más bajos registrados hasta la fecha. La mortalidad en tratamiento sustitutivo está en torno al 5% entre los pacientes de 45 a 64 años, al 11% entre 65 y 74 años y es del 19% entre los pacientes mayores de 75 años.

Palabras clave: Prevalencia. Incidencia. Diálisis. Trasplante.

INTRODUCTION

In 1975 the Spanish Society of Nephrology (SEN) performed the first register of patients with renal disease with data obtained from dialysis and transplant centers. Later on the report on dialysis and transplant that was published by the SEN was generated from the database of the EDTA register. In 1995, only a 60% of the Spanish centers sent information to the

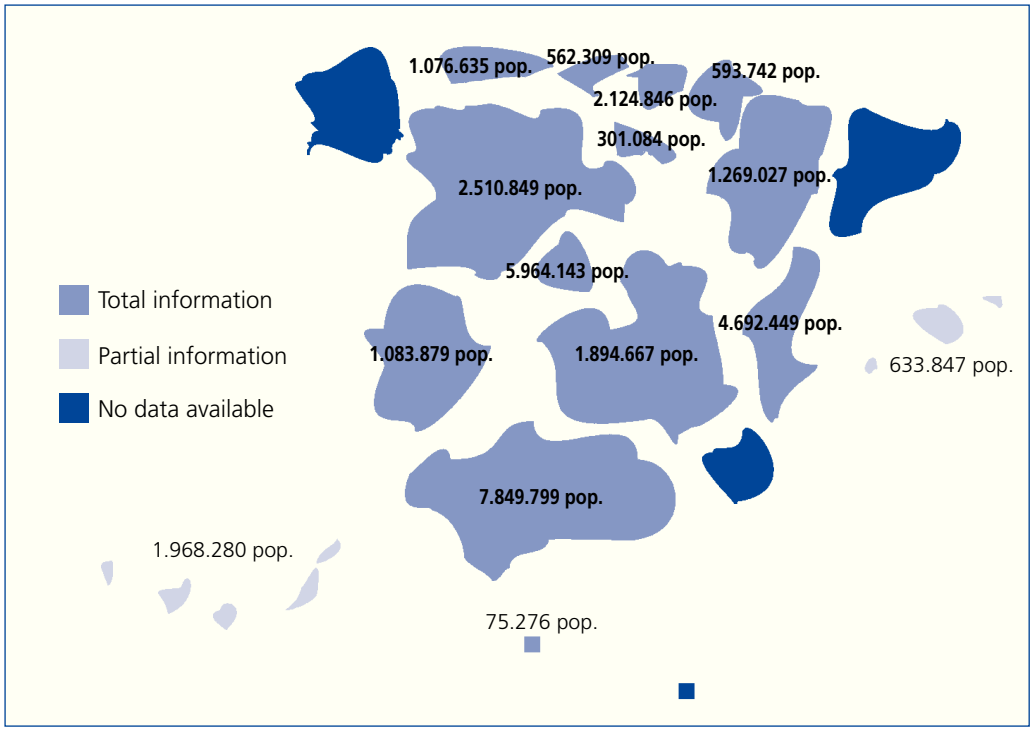


Figure 1. Report scope.

ERA-EDTA, which limited the validity of the results. It was necessary to find out other paths to obtain reliable information about the situation of End-Stage Chronic Renal Disease (ESCRD) in Spain. The way was initiated through the Autonomic Registers.

During the 1990s, several Autonomies initiated and maintained their dialysis and transplant register —Andalusia, Catalonia, the Basque Country, Valencia, Galicia, Asturias and the Balearic Islands—. Thanks to these registers the 1996 Report on Dialysis and Transplant could be generated,[1] together with the collaboration of other autonomies lacking a register —Madrid, Castile-La Mancha, Ceuta and Melilla–, of the Nephrology Societies and of Transplant Coordination Centers —Asturias, the Canary Islands, Castile and Leon, Cantabria, Navarra, Extremadura, La Rioja and Murcia—. The included information referred only to prevalence and incidence.

For the report of the year 1998, the collected information was broadened, and included the age at the beginning of replacement therapy, the etiology and mortality causes. In 2001, eleven autonomic registers collaborated in the report on dialysis and transplant: in addition to the registers that were already active, in 2001 the registers of Castile and Leon and Extremadura were created, and the registers of the Canary Islands and Castile-La Mancha, although not legally constituted, collaborated in the report and were considered completely functioning registers.

In 2005, the SEN arranged with the Company COHS, Human Sciences Consulting, to perform a descriptive and comparative analysis on the situation of already functioning and incipient autonomic registers. In this way, the actual status of the Registers of Patients with Renal Disease of each Autonomy,[2] the administrative situation, the methods, as well as the procedures and definitions could be known. The publication of the resulting report allowed progressing in the register homogenization. Moreover, COHS, Human Sciences Consulting, was in 2004 responsible for the data collection and the generation of the report on the situation of dialysis and transplant, supervised by the Group of Autonomic Registers (GREG).

The present report was again generated by COHS, Human Sciences Consulting, supervised by the National Transplant Organization (NTO) and promoted by the SEN. Functioning Registers in Spain in 2005, as well as Transplant Coordination Centers, Autonomic Nephrology Societies and dialysis and transplants centers from Madrid have also collaborated.

REPORT SCOPE

The covered population in this report is 32,600,056 habitants, 76% of the total Spanish population.[3]

In the Autonomy of the Balearic Island information of 6 out 7 centers was collected. In the Canary Islands the information of patients on dialysis is complete, but the age distribution of the patients with functioning transplant is unknown. The data from Catalonia were not delivered due to technical issues in the Register of Patients with Renal Disease of Catalonia (RMRC). Incidence and prevalence rates were calculated from the population that was covered by the collected centers. The Autonomy of Madrid has contributed with information for the second consecutive year.

Although we speak about Spain, all mentioned data (incidence, prevalence, mortality, treatment modality, etc.) refer to the Autonomies having provided information.

METHODS

For the data collection homogeneous procedures were used, though there were different data sources: Autonomic Regis-

Table I. Incidence according to modality of renal replacement treatment in Spain in 2005

	HD Incidence		DP Incidence		TX Incidence		Global Incidence	Population
	pmp	N	pmp	N	pmp	N	pmp	
Andalusia	107	843	13	100	0	2	120	7,849,799
Aragon	124	155	4	4	1	1	129	1,269,027
Asturias	86	90	17	18	2	2	104	1,076,635
Balearic Islands*	90	57	13	8	0	0	103	633,341
Canary Islands	158	304	29	52	0	0	187	1,968,280
Cantabria	110	62	46	26	0	0	156	562,309
Castile and Leon	89	220	15	35	0	0	104	2,510,849
Castile-La Mancha	100	189	16	31	1	2	117	1,894,667
Ceuta	237	17	0	0	0	0	237	75,276
Madrid**	97	576	17	99	12	74	126	5,964,143
Valencia	125	586	15	69	1	3	140	4,692,449
Extremadura	104	113	16	17	0	0	120	1,083,879
Navarra	89	53	25	15	15	9	130	593,472
Basque Country	92	192	28	57	0	0	120	2,124,846
Rioja	110	33	37	11	0	0	146	301,084

* The covered population by the six collected hospitals is considered.
**Modality of treatment at December 31st of 2005.

ters, Nephrology Societies, Coordinations of Transplant and Dialysis Centers, and Hospitals. In all cases the information referred to aggregated data.

A spreadsheet with aggregated data was created. In this sheet the following data were collected: global data, data on incident patients (grouped by age, sex, primary renal disease and first treatment), data on prevalent patients referring to December 31st, 2005 (grouped by age, sex, primary renal disease and first treatment), and data on deceased patients (grouped by last treatment and cause of death).

The reference population for each Autonomy was added, grouped by age and sex. The same spreadsheet, which was sent to all Communities, had several automatic validation procedures. A check protocol compared the different data introduced in the spreadsheet and contrasted them. This procedure has shown to be efficacious to detect incongruence and partial omissions.

Several calculation procedures allowed the user knowing the annual cumulative incidence and the current prevalence at December 31st, taking as reference the Spanish population.[4,5] Data from 2005 were also compared with those of previous years (temporal coherence) and those reported by the registers themselves.

Once the data of each Community were accepted as valid, age, sex, treatments, etc. were aggregated. These data were treated as global data.

INCIDENCE

According to the data collected, 4125 patients initiated replacement therapy in 2005, that is an incidence of 126 patients per million population —142 pmp in older than 15 years— with a trend to remain stable in the last years,[6,7] and with differences among the Autonomies. The Autonomies with the greatest incidences are the Canary Islands (187 pmp) and Cantabria (156 pmp) and those with the lowest incidences are the Balearic Islands (103 pmp), Asturias (104 pmp), Castile and Leon (104 pmp).

The highest incidence was observed in groups of elderly patients, especially between 65 and 74 years (407 pmp), followed by the group of older than 75 years (395 pmp). The specific incidence was also different among the Autonomies.

There is still a high percentage of primary renal disease of unknown origin, particularly in the elderly. The most frequent known cause of chronic renal failure requiring replacement therapy is diabetes mellitus, which accounts for 23% of all incident patients. There are great differences among Autonomies, the incidence of diabetes being the highest in the Canary Islands (80 pmp).

The causes of ESCRD have a different frequency in the different age groups. In this sense, glomerulonephritis is more frequent among patients aged 15-44 years (28%). In patients older than 65 years, the most frequent causes are renal vascular disease and those of unknown etiology.

PREVALENCE

The prevalence of ESCRD treated in 2005 is 903 patients per million population. This indicator differs in the Autonomies, from 806 pmp in Cantabria to 1,057 pmp in Valencia.

The highest prevalence was observed in the oldest groups of patients, especially between 65 and 74 years (2,348 pmp), followed by the group of older than 75 years (1,851 pmp). The specific incidence was also different among the Autonomies.

Forty-four percent of the patients are on hemodialysis, 6% on peritoneal dialysis and 50% have a functioning transplant. There are differences in treatment distribution between the Autonomies, because of the different transplant rate in each region.

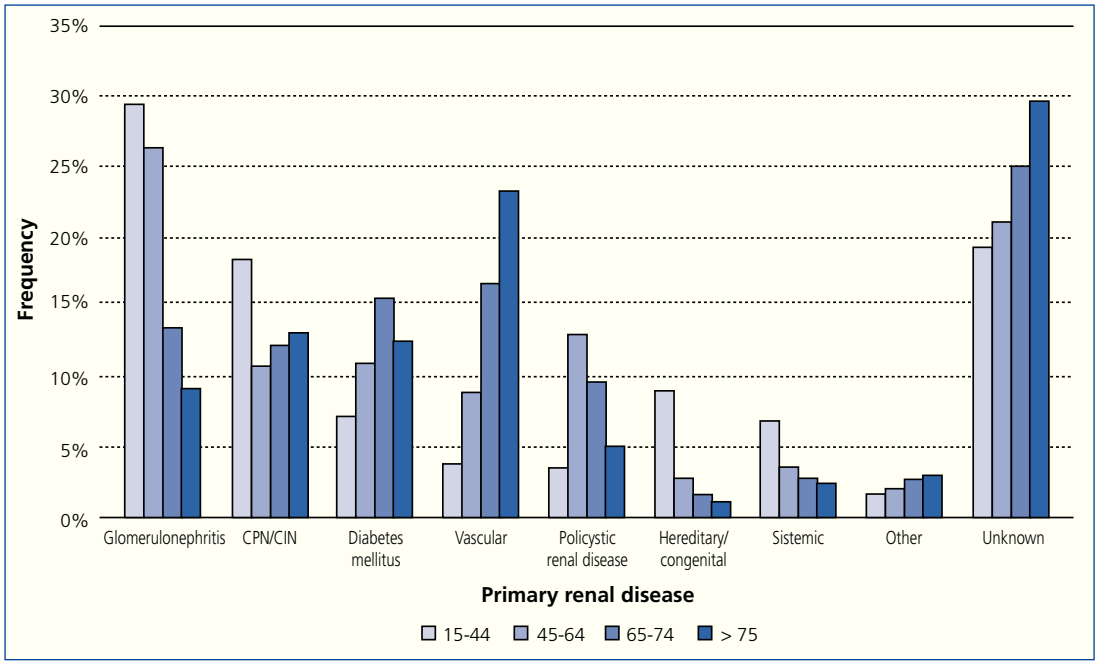


Figure 2. Distribution of the causes of primary renal disease and age groups for the patients initiating renal replacement in 2005.

There are differences in the modality of therapy in the different age groups, and the situation of previous years remains stable. The transplant is more frequent in younger patients.

MORTALITY

Mortality rate among patients with ESCRD was 8.7% in 2005. When considering the last modality of treatment, the mortality of patients on dialysis was 13.8%. Among patients who have received a renal transplant, the mortality rate remains low, below 2%. There are differences in the causes of death between patients on dialysis and those with a functioning graft (fig. 5).

There are differences concerning the modality: the rate is similar in patients on peritoneal dialysis and hemodialysis and lower in those with a renal transplant. When interpreting these results it should be taken into account that the considered modality of treatment is the one present when the patient died, independently of its previous duration.

The most frequent cause of death is cardiovascular disease, which accounts for more than 30% at all ages and treatment groups, a bit lower among the patients with a transplant. The next cause is infection diseases, which are present in 20% of the cases. In patients with a transplant, cancer is the second cause of death in 17% of the cases.

Table II. Prevalence according to the modality of renal replacement therapy in Spain in 2005

	HD Prevalence		DP Prevalence		TX Prevalence		Global Prevalence	Population
	pmp	N	pmp	N	pmp	N	pmp	
Andalusia	451	3.543	38	296	417	3,271	906	7,849,799
Aragon	378	480	7	9	452	573	837	1,269,027
Asturias	337	363	44	47	520	560	901	1,076,635
Balearic Islands*	504	319	28	18	3	2	535	633,341
Canary Islands	488	961	51	100	516	1,016	1,055	1,968,280
Cantabria	270	152	101	57	434	244	806	562,309
Castile and León	395	993	53	132	419	1,057	867	2,510,849
Castile-La Mancha	411	778	45	86	438	829	894	1,894,667
Ceuta	850	64	0	0	0	0	850	75,276
Madrid	348	2,076	51	302	398	2,376	797	5,964,143
Valencia	593	2,784	55	256	409	1,920	1,057	4,692,449
Extremadura	413	448	68	74	367	398	849	1,083,879
Navarra	356	211	51	30	551	327	957	593,472
Basque Country	295	626	76	162	572	1,215	943	2,124,846
Rioja	405	122	50	15	492	148	947	301,084

* The covered population by the six collected hospitals is considered.

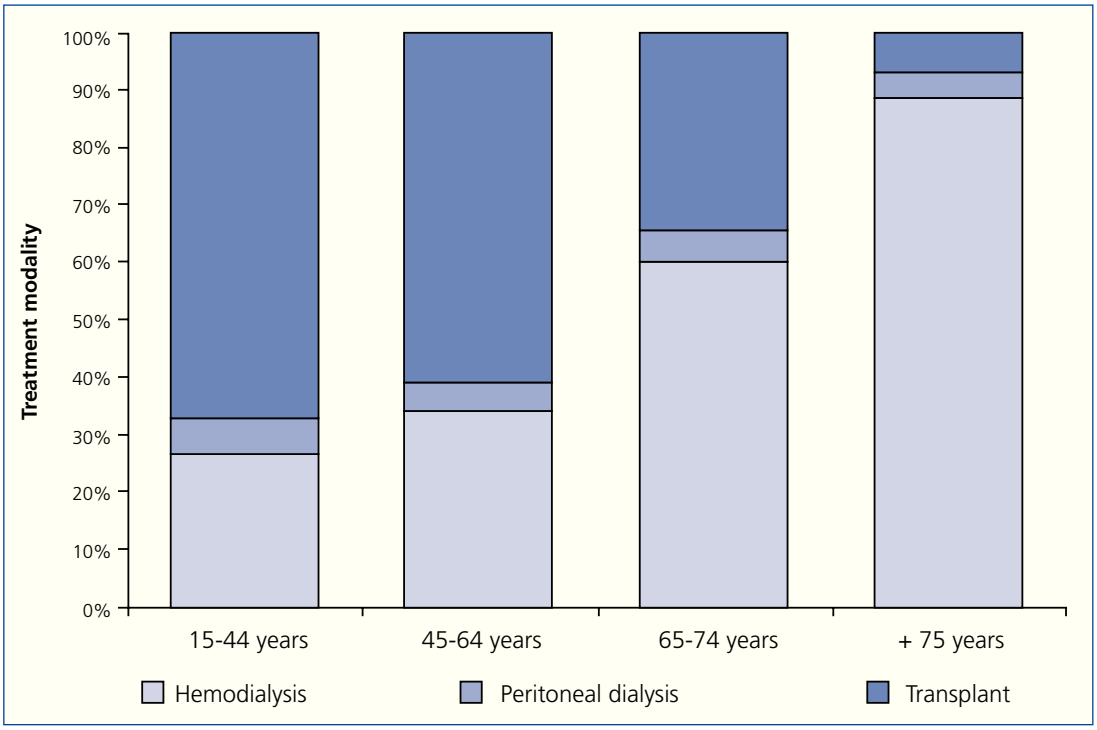


Figure 3. Age distribution and modality of treatment in prevalent patients on renal replacement therapy in Spain in 2005.

INTERNATIONAL COMPARISON

Compared with other European countries, the incidence of chronic renal failure requiring renal replacement therapy is intermediate, being higher than that of countries such as Iceland (75 pmp), Finland (94 pmp), Norway (100 pmp) and the Netherlands (105 pmp), and lower than Greece (195 pmp) and Austria (159 pmp).[8]

The prevalence of treated ESCRD in Spain is middle-high, higher as that in Iceland (479 pmp), Finland (685 pmp), Norway (708 pmp) and lower as that in Greece (922 pmp) and Germany (989 pmp). The distribution by etiology in Spain is similar as that presented by the countries participating in the EDTA Register, though Spain shows a lower prevalence of diabetes mellitus.

The relation between incidence and prevalence highly depends on the mortality rate of patients on renal replacement therapy, and that is very different between European countries,[9] and explained in part by the mortality in the general population.

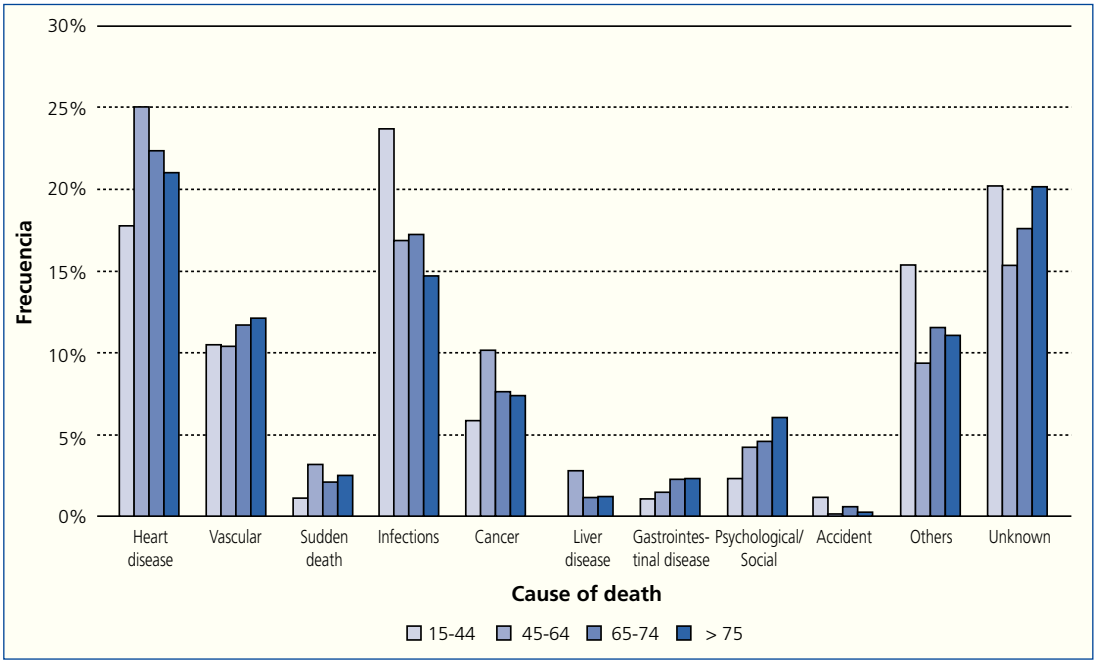


Figure 4. Distribution of the causes of death and age distribution of the patients who died in 2005.

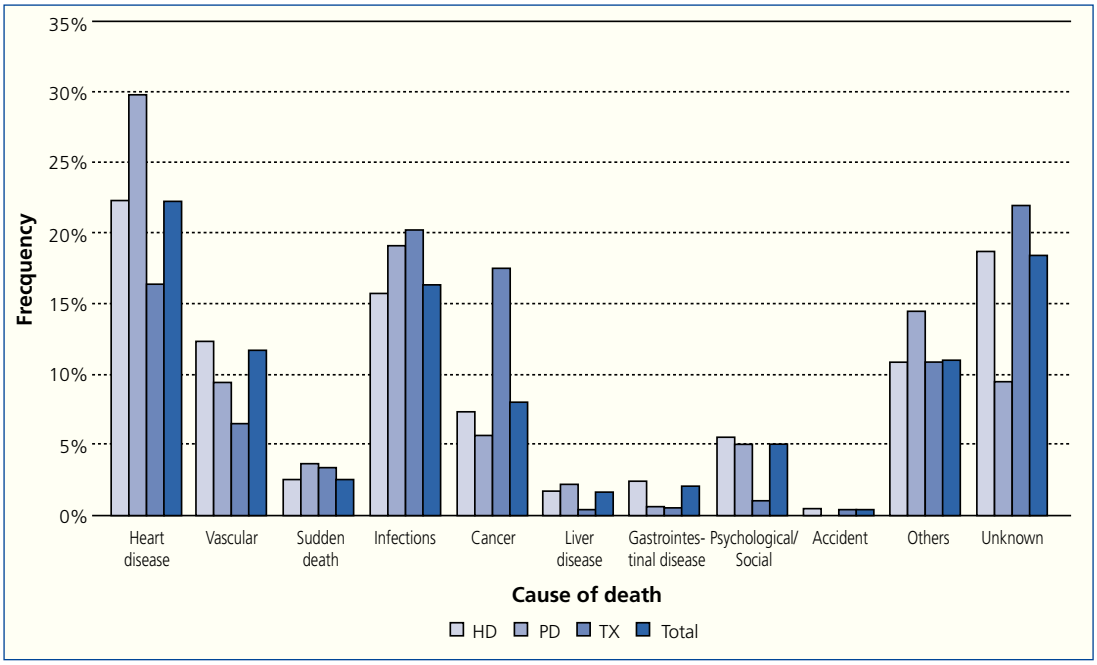


Figure 5. Distribution of the causes of death according to treatment modality.

DISCUSSION

The population covered by this report was approximately 80% of the Spanish population at January 1st of 2005.

The incidence of new patients seems to remain stable, about 126 pmp. It is predictable that, in case of no changes in the tendency, the incidence in Spain will be 123-131 pmp in the following years.

The incidence is variable between the different Autonomies, although the differences in the incidence could be related either to methodological issues in data collection or to actual differences in the nephropathies leading to renal replacement therapy. This incidence trend may also be observed at a level below the Autonomy level.[10-12] In Spain, these differences can not be the cause since almost all collaborating Autonomies have a register with reliable and validated data. It is true that the Canary Islands has one of the highest incidences of patients with diabetes (80 pmp in 2005), but in the other Autonomies the differences in the nephropathies leading to renal failure are not clear.

Renal failure affects mainly old people. The risk in each age group is not expected to vary for the next years, but population aging will determine the number of patients who will initiate renal replacement therapy and in part also the etiology.

Although the incidence in Spain is intermediate among European countries, the prevalence falls within the high range. A possible explanation is that the mortality in patients with transplant is lower as compared with that of patients on replacement therapy, and the proportion of prevalent patients with

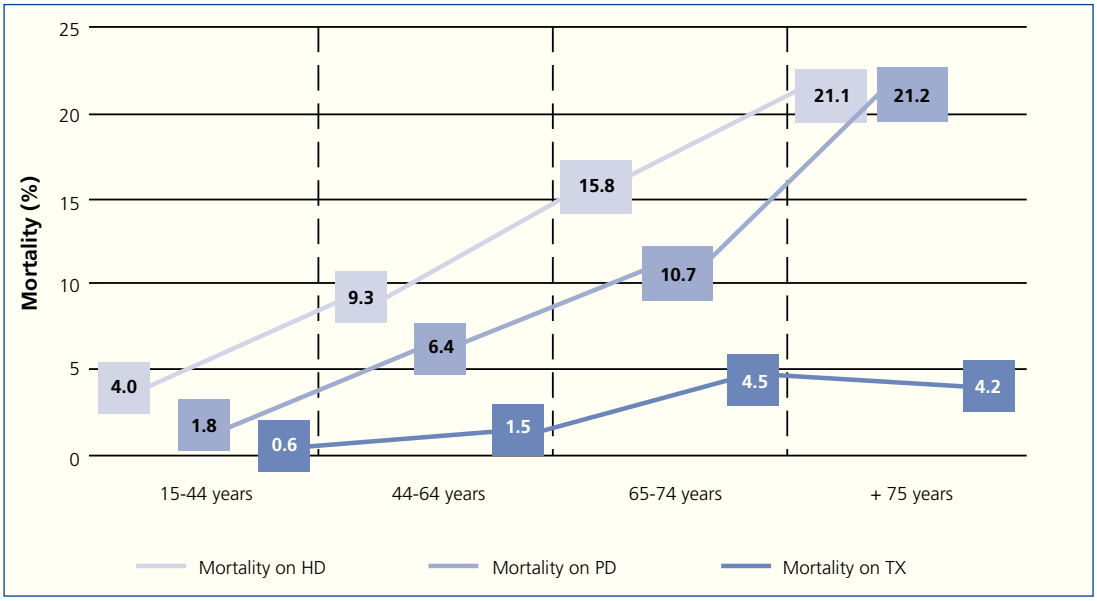
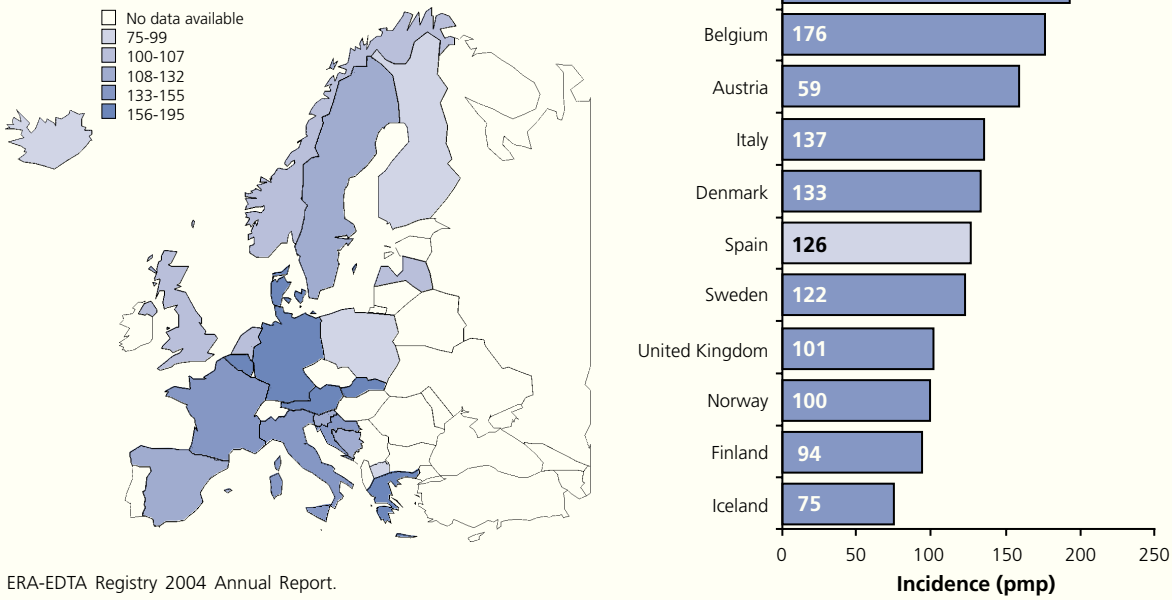


Figure 6. Mortality according to treatment modality and age group.

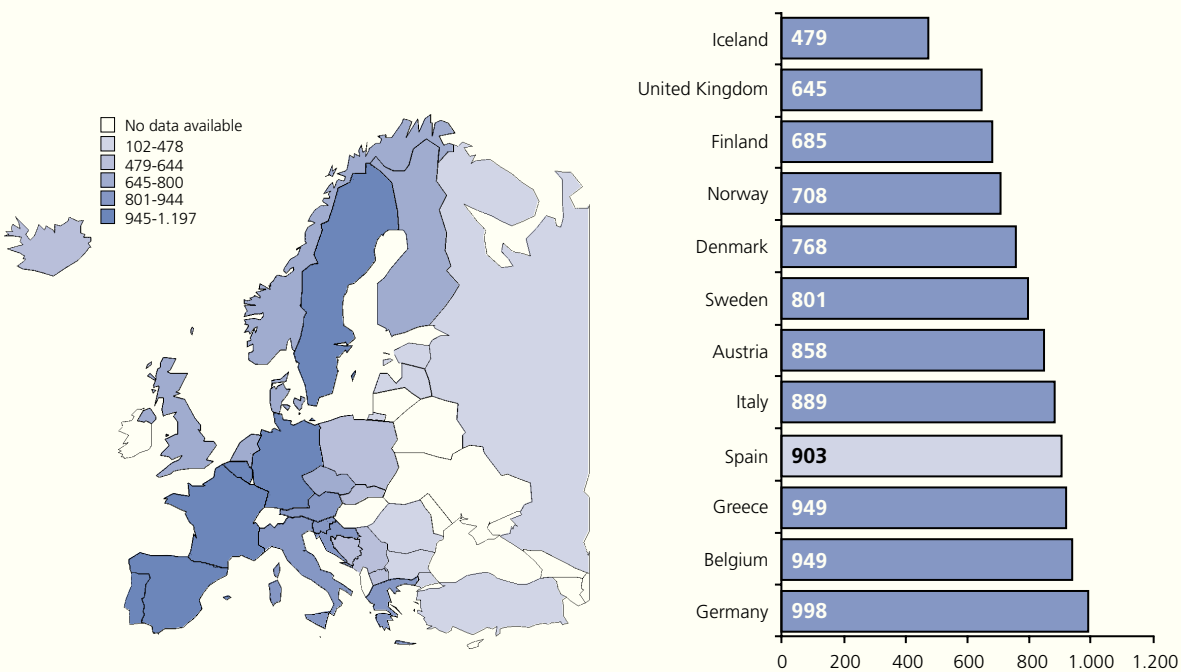


Fuente: ERA-EDTA Registry 2004 Annual Report.

Figure 7. Comparison of the incidence of renal failure requiring renal replacement therapy in European countries.

transplant is high in Spain. Other studies point out that the mortality in patients on replacement therapy is closely related to the mortality in the general population, and the mortality is lower in Mediterranean countries.[9]

Given that the disease is a chronic condition and that the ratio of incident and dead patients is higher than 1, the prevalence will keep on increasing in the next years, though this increase will be affected by the demographic movements that are expected in the next years in Spain.[3] The decrease of the birth rate and the increase in the death rate let us predict that the population in 2030 will be 43,500,000 habitants, with a constant trend to decrease. At the same time, the arrival of im-



Fuente: ERA-EDTA Registry 2004 Annual Report.

Figure 8. Comparison of the incidence of renal failure requiring renal replacement therapy in European countries.

migrants, approximately 100,000 per year for the period 2008-2030 will strongly influence the prevalence in the next years.

REFERENCES

1. Comité de Registro de la SEN: Amenábar JJ, García-López FJ, Robles NR, Saracho R. La Información de los Registros Autonómicos ha sido coordinada en Andalucía por Pavón MI; Aragón: Aladren MJ y Castilla J; Canarias: Lorenzo V y De Bonis E; Cantabria: Martín de Francisco AL; Castilla y León Asturias: Rodrigo A; Cataluña: Cléries M y Vela E; Extremadura: Marigiano N; La Rioja: Sánchez-Casajús A; Murcia: Rodríguez-Gironés M; Navarra: Solozábal C; País Vasco: Magaz A; Valencia: García-Blasco MJ y Zurriaga O. Informe de diálisis y trasplante de la Sociedad Española de Nefrología correspondiente al año 1996. *Nefrología* 1998; Vol. XVIII. Número 2.
2. Unidad de Información de Registros Renales, Promotor: Sociedad Española de Nefrología, Supervisión: Grupo de Registros de Enfermos Renales, Elaboración: COHS, Consultores en Ciencias Humanas (disponible: http://www.senefro.org/modules/subsection/files/informe_170206.pdf?check_idfile=1255).
3. Instituto Nacional de Estadística, INE (http://www.ine.es/).
4. De Irala Estévez J, Martínez-González MA, Seguí-Gómez M. Epidemiología aplicada. Arial Ciencias Médicas.
5. Rothman KJ, Greenland S (1998). Modern Epidemiology. Lippincott-Raven Publishers, Philadelphia.
6. López Revuelta K et al. Informe de diálisis y trasplante correspondiente al año 2001 de la Sociedad Española de Nefrología y Registros Autonómicos. Nefrología. Vol. XXIV. Número 1. 2004.
7. López Revuelta K et al. Informe de diálisis y trasplante correspondiente al año 2001 de la Sociedad Española de Nefrología y Registros Autonómicos. *Nefrología* 2004; Vol. XXIV. Número 1.
8. ERA-EDTA Registry. ERA-EDTA Registry 2004 Annual Report. Academic Medical Center, Amsterdam, The Netherlands, July 2006.
9. Kidney International advance online publication 8 November 2006; doi: 10.1038/sj.ki.5002008.
10. Registro de Enfermos Renales de la Comunidad Valenciana. Informe 2003. Generalitat Valenciana, Conselleria de Sanitat, 2005.
11. García Bazaga M de A, Ramos Aceitero JM, Álvarez Díaz M. Enfermos renales en tratamiento renal sustitutivo en Extremadura. 2005. Junta de Extremadura. Consejería de Sanidad y Consumo, 2007.
12. Unidad de Información sobre Pacientes Renales de la CAPV, «UNIPAR 2005», Sede Central de Publicaciones del Gobierno Vasco. Bilbao, 2006.