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Special Feature

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Renal replacement therapy in Europe—a summary of the 2010 ERA–EDTA Registry Annual Report

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Abstract

Background. This study provides a summary of the 2010 European Renal Association–European Dialysis and Transplant Association (ERA–EDTA) Registry Annual Report (available at www.era-edta-reg.org).

Methods. This report includes data on renal replacement therapy (RRT) using data from the national and regional renal registries in 29 countries in Europe and bordering the Mediterranean Sea. Individual patient data were received from 27 registries, whereas 18 registries contributed data in aggregated form. We present incidence and prevalence of RRT, transplant rates, survival probabilities and expected remaining lifetimes. The latter two are solely based on individual patient records.

Results. In 2010, the overall incidence rate of RRT for end-stage renal disease (ESRD) among all registries reporting to the ERA–EDTA Registry was 123 per million population (pmp) ($n = 91\,798$). The highest incidence rate was reported by Turkey (252 pmp) and the lowest reported by Montenegro (21 pmp). The overall prevalence of RRT for ESRD at 31 December 2010 among all registries reporting to the ERA–EDTA Registry was 741 pmp ($n = 551\,005$). The prevalence varied from 124 pmp in Ukraine to 1580 pmp in Portugal. The overall number of renal transplantations performed in 2010 among all registries was 29.2 pmp ($n = 21\,740$). The highest overall transplant rate was reported from Spain, Cantabria (73 pmp), whereas the highest transplant rate for living donor kidneys was reported from the Netherlands (28 pmp). For patients who started RRT between 2001 and 2005, the unadjusted 5-year patient survival on RRT was 46.2% [95% confidence interval (CI) 46.0–46.3], and on dialysis 38.6% (95% CI 38.5–38.8). The unadjusted 5-year patient survival after the first renal transplantation performed between 2001 and 2005 was 86.6% (95% CI 86.1–87.1) for deceased donor kidneys and 94.1% (95% CI 93.4–94.8) for living donor kidneys.

Introduction

The summary of the 2010 ERA–EDTA (European Renal Association–European Dialysis and Transplant Association) Registry Report includes data on renal replacement therapy (RRT) using 52 datasets from the national and regional renal registries of 29 countries in Europe and bordering the Mediterranean Sea (Figure 1). Datasets with individual patient data for analysis were received from 27 national and regional registries in 14 countries, whereas 18 national registries from 18 countries contributed data in aggregated form.

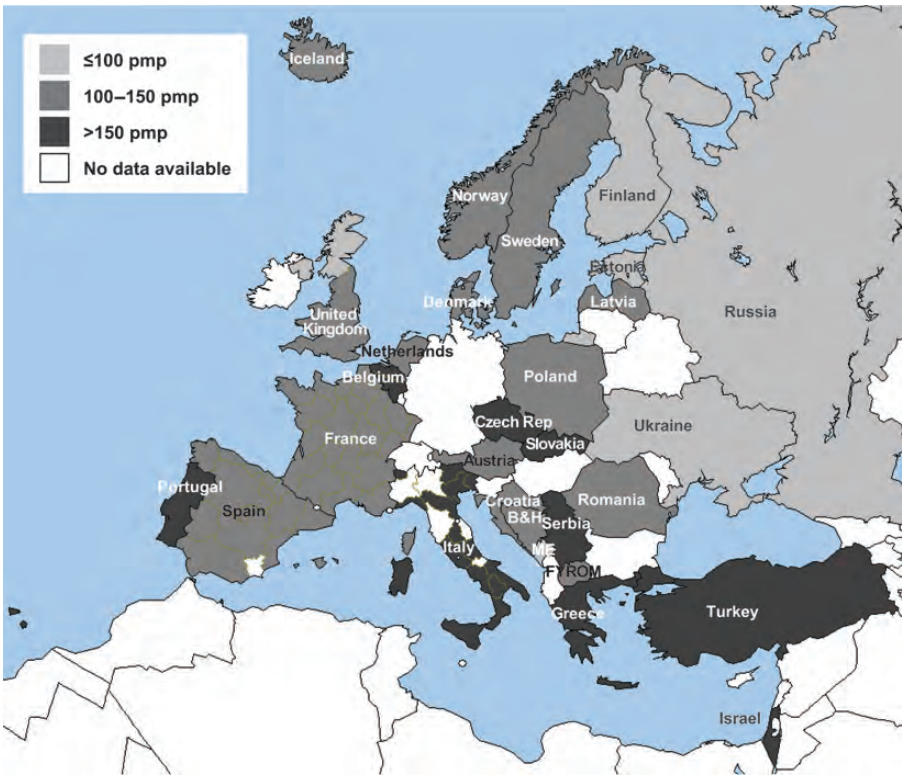

Fig. 1. Incidence of RRT pmp at Day 1, 2010 among all national and regional renal registries in 29 countries reporting to the ERA-EDTA Registry in 2010. B&H, Bosnia–Herzegovina; FYROM, Former Yugoslav Republic of Macedonia; ME, Montenegro. The incidence data for the Czech Republic, Italy, Slovakia and Turkey include dialysis patients only.

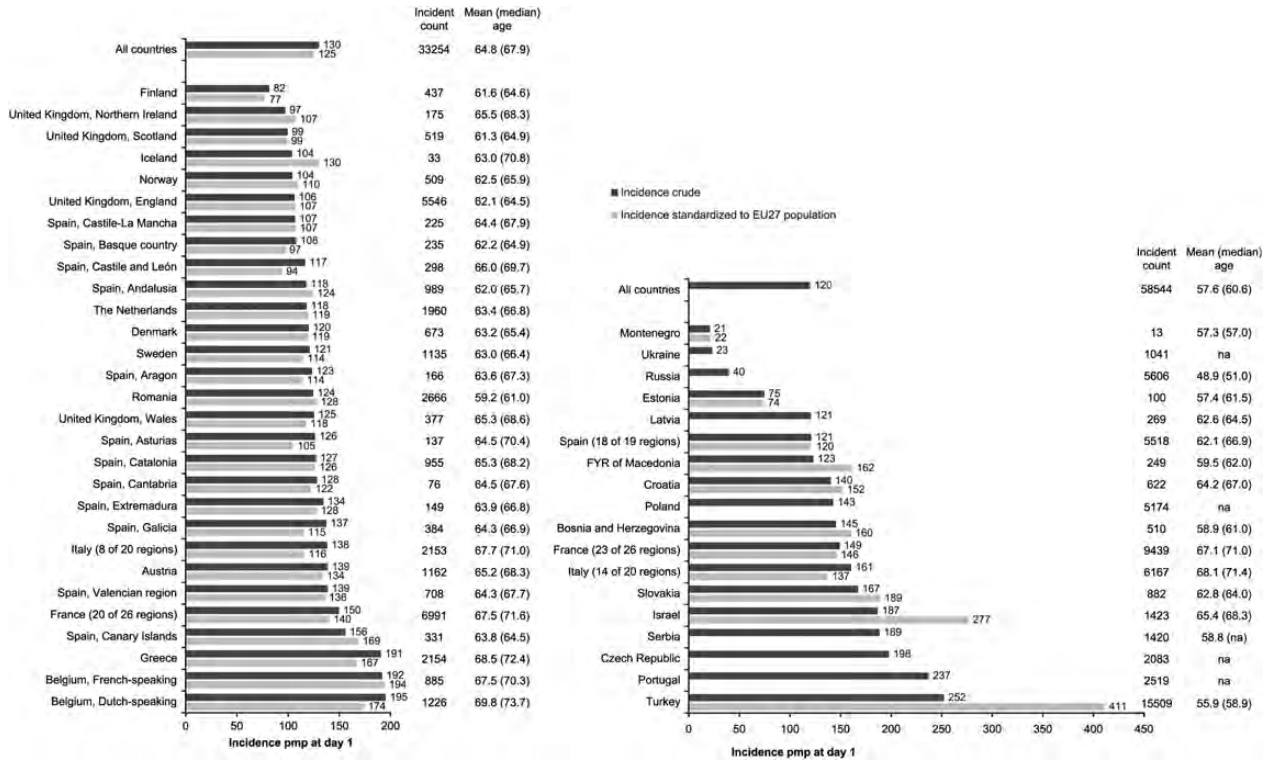

Fig. 2. Incidence of RRT pmp at Day 1 in 2010, unadjusted and standardized to the age and gender distribution of the EU27 population, and the mean and median age (years) at RRT initiation. Figures include data from renal registries providing individual patient data (left figure) and aggregated data (right figure). The aggregated data from the Czech Republic, Italy, Slovakia and Turkey include dialysis patients only.

Table 1. Incidence of RRT at Day 1 by age group, as counts (*N*) and pmarp, unadjusted

Country/region providing individual patient data	0–19 years *N* (pmarp)	20–44 years *N* (pmarp)	45–64 years *N* (pmarp)	65–74 years *N* (pmarp)	75+ years *N* (pmarp)
Austria	11 (6.3)	111 (38.2)	355 (156.5)	358 (444.3)	327 (486.4)
Belgium					
Dutch-speaking[a]		92 (45.5)	288 (166.0)	292 (507.0)	554 (975.0)
French-speaking[a]		76 (48.1)	275 (229.4)	195 (560.5)	339 (893.5)
Denmark	9 (6.6)	83 (45.9)	233 (155.0)	170 (319.6)	178 (456.1)
Finland	11 (9.0)	49 (29.2)	163 (105.9)	131 (265.0)	83 (192.4)
France (20 of 26 regions)	88 (7.8)	623 (41.8)	1859 (149.4)	1580 (412.7)	2841 (660.8)
Greece	20 (9.1)	154 (38.5)	532 (180.2)	555 (501.4)	893 (848.4)
Iceland	1 (11.1)	4 (35.6)	8 (103.8)	9 (448.1)	11 (593.4)
Italy (8 of 20 regions)	19 (6.7)	185 (34.9)	547 (129.0)	585 (367.4)	817 (503.1)
Norway	7 (5.6)	88 (52.8)	143 (114.7)	131 (344.6)	140 (397.4)
Romania	34 (7.6)	426 (50.2)	1164 (220.6)	686 (378.7)	356 (257.0)
Spain					
Andalusia	14 (7.6)	148 (45.5)	319 (157.3)	239 (365.3)	269 (439.6)
Aragon	3 (12.3)	20 (40.8)	50 (144.9)	50 (426.4)	43 (286.3)
Asturias	2 (13.0)	19 (50.6)	36 (113.9)	35 (335.8)	45 (333.9)
Basque country	4 (10.6)	30 (38.8)	85 (139.7)	67 (331.5)	49 (222.6)
Canary Islands	1 (2.4)	42 (48.0)	125 (233.0)	73 (454.7)	90 (702.0)
Cantabria[a]		6 (27.6)	26 (159.9)	26 (529.3)	18 (294.0)
Castile and León[a]		31 (35.4)	99 (144.1)	62 (248.9)	106 (319.3)
Castile-La Mancha[a]		29 (35.9)	68 (138.8)	67 (406.8)	61 (296.2)
Catalonia	9 (6.0)	101 (34.4)	290 (157.1)	231 (386.3)	324 (505.3)
Extremadura	1 (4.5)	19 (48.0)	49 (176.9)	44 (450.9)	36 (313.6)
Galicia	2 (4.5)	53 (53.6)	117 (157.5)	94 (325.7)	118 (351.2)
Valencian region	9 (8.9)	82 (41.6)	224 (176.0)	173 (386.7)	220 (538.6)
Sweden	29 (13.3)	139 (45.3)	348 (144.4)	299 (326.8)	320 (400.4)
The Netherlands	38 (9.7)	232 (42.4)	613 (131.7)	535 (379.1)	542 (469.1)
UK, All countries[a]		1073 (50.4)	2236 (140.7)	1608 (297.8)	1693 (345.2)
England[a]		907 (50.5)	1922 (145.2)	1317 (293.5)	1400 (339.9)
Northern Ireland[a]		22 (35.1)	53 (122.6)	45 (314.2)	55 (468.9)
Scotland	7 (6.0)	92 (52.6)	161 (113.4)	134 (282.8)	125 (308.1)
Wales[a]		52 (55.3)	100 (125.3)	112 (379.0)	113 (430.1)
All countries	319 (8.0)	3915 (44.4)	10 252 (153.7)	8295 (371.2)	10 473 (490.0)

[a]Patients <20 years of age are not reported.

Table 2. Incidence of RRT at Day 1 over the period 2009–2010 among patients aged 0–19, by age group, as counts (*N*) and pmarp, unadjusted

Cohort	0–4 years *N* (pmarp)	5–9 years *N* (pmarp)	10–14 years *N* (pmarp)	15–19 years *N* (pmarp)	0–19 years *N* (pmarp)
All countries	143 (8.0)	87 (4.9)	146 (8.3)	257 (13.5)	633 (8.8)

Table 3. Incidence of RRT at Day 1 by PRD for countries/regions providing individual patient data and for countries/regions providing aggregated data, as counts (*N*) and pmp, unadjusted

		DM					
Country	GN *N* (pmp)	Type 1 *N* (pmp)	Type II *N* (pmp)	Both N (pmp)	HT/RVD N (pmp)	Other N (pmp)	Unkn/Miss N (pmp)
Regions providing individual patient data							
Austria	123 (14.7)	34 (4.1)	316 (37.7)	350 (41.7)	238 (28.4)	296 (35.3)	155 (18.5)
Belgium							
Dutch-speaking[a]	101 (16.1)	34 (5.4)	223 (35.5)	257 (40.9)	203 (32.3)	563 (89.7)	102 (16.2)
French-speaking[a]	90 (19.5)	18 (3.9)	165 (35.7)	183 (39.6)	231 (50.0)	319 (69.1)	62 (13.4)
Denmark	80 (14.3)	61 (10.9)	94 (16.8)	155 (27.7)	91 (16.3)	176 (31.5)	171 (30.5)
Finland	48 (8.9)	53 (9.9)	98 (18.3)	151 (28.2)	25 (4.6)	136 (25.3)	77 (14.4)
France (20 of 26 regions)	792 (16.9)			1461 (31.2)	1766 (37.8)	1910 (40.9)	1062 (22.7)
Greece	160 (14.1)	32 (2.8)	597 (52.8)	629 (55.6)	290 (25.7)	396 (35.0)	679 (60.0)
Iceland	6 (18.9)	1 (3.1)	4 (12.6)	5 (15.7)	10 (31.5)	7 (22.0)	5 (15.7)
Italy (8 of 20 regions)	225 (14.4)			409 (26.2)	512 (32.8)	513 (32.9)	494 (31.7)
Norway	80 (16.4)	35 (7.2)	52 (10.6)	87 (17.8)	188 (38.4)	139 (28.4)	15 (3.1)
Romania	389 (18.1)			379 (17.7)	173 (8.0)	689 (32.1)	1036 (48.3)
Spain							
Andalusia	119 (14.2)			225 (26.8)	167 (19.9)	264 (31.4)	214 (25.5)
Aragon	20 (14.9)	5 (3.7)	36 (26.7)	41 (30.4)	26 (19.3)	43 (32.0)	36 (26.7)
Asturias	7 (6.5)	10 (9.2)	20 (18.4)	30 (27.7)	23 (21.2)	29 (26.7)	48 (44.3)
Basque country	42 (19.3)	15 (6.9)	24 (11.0)	39 (17.9)	41 (18.8)	68 (31.1)	45 (20.6)
Canary Islands				154 (72.6)			177 (83.4)
Cantabria[a]	19 (32.1)	2 (3.4)	14 (23.6)	16 (27.0)	25 (42.2)	14 (23.6)	2 (3.4)
Castile and León[a]	36 (14.1)	16 (6.3)	67 (26.2)	83 (32.4)	57 (22.2)	76 (29.7)	46 (18.0)
Castile-La Mancha[a]	30 (14.2)			58 (27.5)	19 (9.0)	61 (29.0)	57 (27.1)
Catalonia	98 (13.0)	25 (3.3)	190 (25.3)	217 (28.9)	144 (19.2)	229 (30.5)	267 (35.5)
Extremadura	14 (12.6)			49 (44.2)	13 (11.7)	31 (27.9)	42 (37.9)
Galicia	42 (15.0)	20 (7.2)	79 (28.2)	99 (35.4)	48 (17.2)	88 (31.4)	107 (38.3)
Valencian region	81 (15.8)			129 (25.2)	174 (34.0)	165 (32.3)	159 (31.1)
Sweden	149 (15.9)	100 (10.7)	170 (18.1)	270 (28.8)	209 (22.3)	290 (30.9)	217 (23.1)
The Netherlands	150 (9.0)	56 (3.4)	221 (13.3)	277 (16.7)	452 (27.2)	477 (28.7)	604 (36.4)
UK, All countries[a]	797 (12.8)			1396 (22.4)	692 (11.1)	1879 (30.2)	1846 (29.7)
England[a]	641 (12.3)			1135 (21.7)	551 (10.5)	1572 (30.1)	1647 (31.5)
Northern Ireland[a]	22 (12.2)			46 (25.6)	19 (10.6)	58 (32.2)	30 (16.7)
Scotland	74 (14.2)			121 (23.2)	72 (13.8)	162 (31.0)	90 (17.3)
Wales[a]	60 (20.0)			94 (31.3)	51 (17.0)	92 (30.6)	80 (26.6)
All countries	3698 (14.5)	2627 (10.3)	3202 (12.5)	7149 (28.0)	5818 (22.8)	8863 (34.6)	7726 (30.2)
Regions providing aggregated data							
Bosnia and Herzegovina	51 (14.5)	27 (7.7)	97 (27.7)	124 (35.3)	82 (23.4)	184 (52.4)	69 (19.7)
Croatia	73 (16.5)			168 (37.9)	114 (25.7)	172 (38.8)	95 (21.4)
Estonia	11 (8.2)	15 (11.2)	6 (4.5)	21 (15.7)	28 (20.9)	40 (29.9)	0 (0)
France (23 of 26 regions)[b]	1018 (16.1)			2037 (32.2)	2282 (36.1)	2490 (39.4)	1612 (25.5)
FYR of Macedonia	24 (11.9)	4 (2.0)	45 (22.3)	49 (24.2)	83 (41.1)	52 (25.7)	41 (20.3)
Israel	92 (12.2)	460 (60.3)	175 (23.0)	635 (83.3)	212 (27.8)	216 (28.3)	268 (35.0)
Italy (14 of 20 regions)[c]	919 (24.0)			1252 (32.6)	1314 (34.2)	1085 (28.3)	1597 (41.4)
Latvia	36 (16.2)	5 (2.2)	33 (14.8)	38 (17.0)	46 (20.6)	125 (56.1)	24 (10.8)
Montenegro	5 (8.1)	4 (6.5)	0 (0)	4 (6.5)	2 (3.2)	1 (1.6)	1 (1.6)
Poland	915 (25.3)			1189 (32.8)	775 (21.3)	625 (17.3)	1670 (46.0)
Portugal[d]	207 (19.5)			793 (74.7)	378 (35.6)	582 (54.6)	559 (52.6)
Russia	1887 (13.3)	431 (3.0)	454 (3.2)	885 (6.2)	487 (3.4)	2061 (14.5)	286 (2.0)
Serbia	138 (18.3)	98 (13.0)	239 (31.6)	337 (44.6)	371 (49.3)	475 (63.2)	99 (13.2)
Slovakia[c]	89 (16.9)			329 (62.6)	110 (20.9)	339 (64.1)	15 (2.8)
Spain (18 of 19 regions)	640 (14.0)			1356 (29.8)	788 (17.3)	1516 (33.3)	1218 (26.7)
Turkey[c]	1086 (17.7)	993 (16.2)	4001 (65.0)	4994 (81.1)	4218 (68.7)	3086 (50.2)	2125 (34.4)
Ukraine	371 (8.2)			229 (5.2)	65 (1.4)	334 (7.3)	42 (0.9)
All countries	7562 (15.8)	2037 (4.3)	5050 (10.6)	14 440 (30.3)	11 355 (23.8)	13 383 (28.0)	9721 (20.4)

GN, glomerulonephritis/sclerosis; DM, diabetes mellitus; HT/RVD, hypertension/renal vascular disease; Unkn/Miss, unknown/missing.
[a]Patients <20 years of age are not reported.
[b]The type of diabetes is given by the comorbidity and not by the cause of renal failure.
[c]Data include dialysis patients only.
[d]Renal vascular disease is not reported separately, but is included in the category Other.

The incidence and prevalence data as well as transplant rates were based on the data from countries and regions that provided individual patient data or aggregated data. Survival analysis and the calculation of expected remaining lifetimes were solely based on individual patient records. More detailed data than those presented in the paper were published in the full 2010 ERA–EDTA Registry Annual Report [1] which is also available on www.era-edta-reg.org.

The incidence of RRT for end-stage renal disease

In 2010, the overall number of patients starting RRT for end-stage renal disease (ESRD) among all registries reporting to the ERA–EDTA Registry was 91 798. The total population covered by these registries was 743.7 million resulting in an unadjusted incidence rate of 123 per million population (pmp). The highest unadjusted incidence rates were reported from Turkey (252 pmp), Portugal (237 pmp) and the Czech Republic (198 pmp). The incidence rate standardized for the EU 27 population was also highest in Turkey (411 pmp). Unadjusted incidence rates <50 pmp were reported by Montenegro (21 pmp), Ukraine (23 pmp) and Russia (40 pmp). The mean age was 64.8 years for countries/regions providing individual patient data and 57.6 years for countries/regions providing aggregated data. It varied across countries ranging from 48.9 years in Russia to 69.8 years in Belgium (Dutch-speaking) (Figure 2).

Table 4. Incidence of RRT at Day 91 by treatment modality for countries/regions providing individual patient data and for countries/regions providing aggregated data, as counts (*N*) and pmp, unadjusted

Country	All *N* (pmp)	HD *N* (pmp)	PD *N* (pmp)	Tx *N* (pmp)	Unkn/Miss *N* (pmp)
Regions providing individual patient data					
Austria	1034 (123.2)	884 (105.4)	106 (12.6)	44 (5.2)	0 (0)
Belgium					
Dutch-speaking[a]	1097 (174.7)	967 (154.0)	116 (18.5)	14 (2.2)	0 (0)
French-speaking[a]	819 (177.4)	699 (151.4)	97 (21.0)	23 (5.0)	0 (0)
Denmark	622 (111.0)	391 (69.8)	195 (34.8)	35 (6.2)	1 (0.2)
Finland	426 (79.4)	313 (58.4)	111 (20.7)	2 (0.4)	0 (0)
France (20 of 26 regions)	6487 (138.7)	5388 (115.2)	806 (17.2)	281 (6.0)	12 (0.2)
Greece	1923 (170.1)	1755 (155.2)	155 (13.7)	13 (1.1)	0 (0)
Iceland	32 (100.6)	23 (72.3)	7 (22.0)	2 (6.3)	0 (0)
Italy (8 of 20 regions)[b]	1982 (127.2)	1670 (107.1)	303 (19.5)	9 (0.6)	0 (0)
Norway	482 (98.6)	315 (64.4)	98 (20.0)	69 (14.1)	0 (0)
Romania	2206 (102.9)	1968 (91.8)	214 (10.0)	24 (1.1)	0 (0)
Spain					
Andalusia	951 (113.2)	818 (97.4)	101 (12.0)	32 (3.8)	0 (0)
Aragon	158 (117.3)	137 (101.7)	18 (13.4)	3 (2.2)	0 (0)
Asturias[b]	121 (111.6)	93 (86.1)	18 (16.3)	10 (9.2)	0 (0)
Basque country	220 (100.8)	175 (80.2)	40 (18.3)	5 (2.3)	0 (0)
Canary Islands[a]	308 (145.3)	269 (126.9)	38 (17.7)	1 (0.6)	0 (0)
Cantabria[a]	71 (119.8)	45 (75.9)	20 (33.7)	6 (10.1)	0 (0)
Castile and León[a]	292 (114.1)	233 (91.1)	53 (20.7)	6 (2.3)	0 (0)
Castile-La Mancha[a]	225 (106.8)	186 (88.3)	35 (16.6)	4 (1.9)	0 (0)
Catalonia[b]	911 (121.3)	722 (96.2)	119 (15.9)	69 (9.2)	0 (0)
Extremadura[b]	140 (126.0)	117 (105.9)	21 (18.9)	1 (1.2)	0 (0)
Galicia[b]	372 (133.0)	268 (96.0)	90 (32.1)	14 (5.0)	0 (0)
Valencian region	699 (136.7)	591 (115.6)	92 (18.0)	16 (3.1)	0 (0)
Sweden	1034 (110.3)	625 (66.6)	326 (34.8)	83 (8.9)	0 (0)
The Netherlands	1794 (108.0)	1211 (72.9)	365 (22.0)	218 (13.1)	0 (0)
UK, All countries[a,b]	6203 (99.6)	4483 (72.0)	1203 (19.3)	509 (8.2)	9 (0.1)
England[a,b]	5206 (99.7)	3704 (70.9)	1031 (19.7)	467 (8.9)	3 (0.1)
Northern Ireland [a,b]	166 (92.1)	145 (80.4)	13 (7.0)	8 (4.6)	0 (0)
Scotland	485 (92.9)	378 (72.4)	88 (16.9)	15 (2.9)	4 (0.8)
Wales[a,b]	352 (117.0)	260 (86.4)	71 (23.6)	20 (6.5)	1 (0.4)
All countries	30 615 (119.7)	24 350 (95.2)	4747 (18.6)	1494 (5.8)	21 (0.1)
Regions providing aggregated data					
Bosnia and Herzegovina	439 (125.1)	418 (119.2)	20 (5.7)	1 (0.3)	0 (0)
Croatia	557 (125.5)	501 (112.9)	49 (11.0)	7 (1.6)	0 (0)
Czech Republic[c]	1579 (149.9)	1493 (141.7)	86 (8.2)		0 (0)
Estonia	98 (73.1)	72 (53.7)	25 (18.7)	1 (0.7)	0 (0)
France (23 of 26 regions)	8230 (130.1)	6925 (109.4)	816 (12.9)	484 (7.6)	5 (0.1)
FYR of Macedonia	202 (99.9)	198 (97.9)	2 (1.0)	2 (1.0)	0 (0)
Israel	1340 (175.8)	1191 (156.2)	113 (14.8)	36 (4.7)	0 (0)
Italy (14 of 20 regions)[c]	5850 (152.2)	5076 (132.1)	584 (15.2)		190 (4.9)
Latvia	240 (107.7)	204 (91.5)	36 (16.2)	0 (0)	0 (0)
Montenegro	7 (11.3)	4 (6.5)	1 (1.6)	2 (3.2)	0 (0)
Serbia	1005 (133.5)	873 (116.0)	120 (15.9)	12 (1.6)	0 (0)
Slovakia[c]	718 (136.2)	697 (132.2)	21 (4.0)		0 (0)
Turkey[c]	13 194 (214.5)	11 932 (194.0)	1262 (20.5)		0 (0)
All countries	33 459 (160.6)	29 584 (142.0)	3135 (15.0)	545 (5.9)	195 (0.9)

HD, haemodialysis; PD, peritoneal dialysis; Tx, transplant; Unkn/Miss, unknown/missing.
[a]Patients <20 years of age are not reported.
[b]The incident counts at Day 91 are estimated.
[c]Data include dialysis patients only.

Table 1 reports the unadjusted incidence rate of RRT per million age-related population (pmarp) at Day 1 by age group. Especially in the highest age category (75+ years at the start of RRT), there is a substantial variation in incidence rates, ranging from 192 pmarp in Finland to 975 pmarp in Dutch-speaking Belgium.

For children we performed a separate analysis including data from a limited number of registries: Austria, Denmark, Finland, France, Greece, Iceland, Norway, Romania, Spain (Andalusia), Spain (Aragon), Spain (Asturias), Spain (Basque country), Spain (Canary Islands), Spain (Catalonia), Spain (Extremadura), Spain (Galicia), Spain (Valencian region), Sweden, the Netherlands and UK (Scotland) (Table 2). As numbers of children starting RRT were low, we present averages for 2009–10. Please visit www.espn-reg.org for a more detailed overview of paediatric RRT data in Europe.

Table 3 shows that the number of patients pmp starting RRT in 2010 for ESRD due to diabetes mellitus varied across countries from 5.2 pmp in Ukraine to 83.3 pmp in Israel. For those renal registries making the distinction between diabetes mellitus type I and II, the number of patients pmp starting RRT for ESRD due to diabetes mellitus type I varied from 2 pmp in the FYR of Macedonia to 60 pmp in Israel and for that due to diabetes mellitus type II from 3 pmp in Russia to 65 pmp in Turkey.

The incidence of the different treatment modalities [haemodialysis (HD), peritoneal dialysis (PD) and transplantation (Tx)] in 2010 was measured as the number of patients pmp on a treatment modality at Day 91 of RRT (Table 4). Whereas the incidence rates of HD were highest in Turkey (194 pmp), Israel (156 pmp) and Greece (155 pmp), the incidence rates of PD were highest in Sweden and Denmark (both 35 pmp), and Spain, Cantabria (34 pmp). The highest incidence rates of patients living on a functioning graft at Day 91 of RRT were observed in Norway (14 pmp), the Netherlands (13 pmp) and Spain, Cantabria (10 pmp).

The prevalence of RRT for ESRD

The overall prevalence count at 31 December 2010 among all registries reporting to the ERA–EDTA Registry was 551 005, corresponding to a prevalence of 741 pmp. Figure 3 shows that the unadjusted prevalence of RRT pmp was highest in Portugal (1580 pmp), Belgium (French-speaking) (1237 pmp) and Spain, Catalonia (1188 pmp). The lowest unadjusted prevalence was reported by Ukraine (124 pmp) and Russia (186 pmp). Figure 3 also shows the prevalence of RRT standardized for the EU 27 population. Furthermore, the mean age of the prevalent patients on RRT at 31 December 2010 ranged from 47.5 years in Russia to 67.4 years in Italy, whereas the overall mean age was 60.2 years among the countries providing individual patient data and 55.0 years among the countries providing aggregated data (Figure 3). Table 5 shows the unadjusted prevalence of RRT pmarp at 31 December 2010 by age group. Especially in the highest age category (75+ years at the start of RRT), there is a remarkable variation in prevalence,

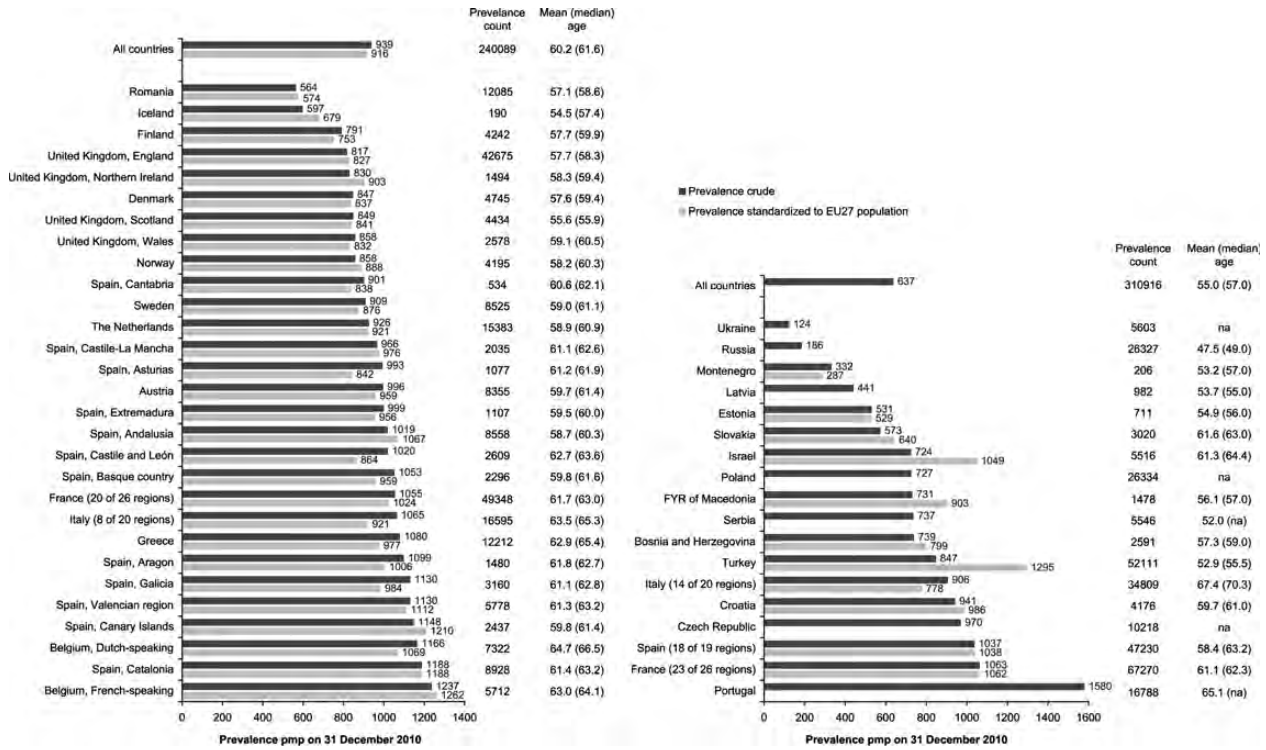

Fig. 3. Prevalence of RRT pmp at 31 December 2010, unadjusted and standardized to the age and gender distribution of the EU27 population, and the mean and median age (years). Figures include data from renal registries providing individual patient data (left figure) and aggregated data (right figure). The aggregated data from Israel, Italy and Slovakia include dialysis patients only. In Italy, the prevalence of RRT is underestimated by ∼11%, due to an estimated 25–30% under-reporting of patients living on a functioning graft, and in Romania, the prevalence of RRT is underestimated by ∼3%, due to an estimated 30% under-reporting of patients living on a functioning graft.

Table 5. Prevalence of RRT on 31 December 2010 by age group, as counts (*N*) and pmarp, unadjusted

Country/region providing individual patient data	0–19 years *N* (pmarp)	20–44 years *N* (pmarp)	45–64 years *N* (pmarp)	65–74 years *N* (pmarp)	75+ years *N* (pmarp)
Austria	102 (58.7)	1322 (455.1)	3551 (1565.2)	2025 (2513.1)	1355 (2015.7)
Belgium					
Dutch-speaking[a]		846 (418.8)	2580 (1487.0)	1679 (2915.1)	2217 (3901.6)
French-speaking[a]		811 (513.8)	2188 (1825.5)	1239 (3561.4)	1474 (3885.2)
Denmark	93 (67.9)	997 (551.1)	1930 (1283.5)	1019 (1915.5)	706 (1809.2)
Finland	123 (100.7)	684 (408.0)	1945 (1263.3)	961 (1943.7)	529 (1226.5)
France (20 of 26 regions)	507 (45.0)	7686 (515.1)	18 890 (1518.6)	9929 (2593.4)	12 336 (2869.3)
Greece	108 (49.2)	1723 (430.4)	4190 (1419.3)	3024 (2731.7)	3166 (3007.8)
Iceland	5 (55.5)	53 (472.1)	70 (908.2)	36 (1792.4)	26 (1402.7)
Italy (8 of 20 regions)[b]	96 (33.8)	2246 (424.1)	5853 (1380.5)	3945 (2477.8)	4455 (2743.2)
Norway	78 (62.8)	819 (491.3)	1735 (1391.2)	902 (2372.6)	661 (1876.3)
Romania[c]	115 (25.7)	2552 (300.5)	5506 (1043.7)	2593 (1431.6)	1319 (952.4)
Spain					
Andalusia	101 (54.6)	1665 (511.5)	3452 (1702.4)	1832 (2800.0)	1508 (2464.4)
Aragon	10 (41.1)	218 (444.2)	578 (1675.2)	307 (2618.0)	367 (2443.7)
Asturias	6 (39.0)	168 (447.3)	433 (1370.4)	225 (2158.9)	245 (1818.1)
Basque country	32 (84.8)	373 (482.3)	938 (1541.8)	546 (2701.5)	407 (1849.1)
Canary Islands	9 (21.3)	445 (509.1)	997 (1858.2)	550 (3425.9)	436 (3400.6)
Cantabria[a]		84 (386.6)	228 (1402.5)	126 (2565.2)	96 (1567.9)
Castile and León[a]		368 (420.8)	1010 (1470.3)	544 (2184.1)	687 (2069.5)
Castile-La Mancha[a]		352 (435.6)	767 (1566.0)	471 (2859.8)	445 (2160.6)
Catalonia	91 (61.1)	1421 (483.7)	3318 (1797.5)	2042 (3415.2)	2056 (3206.3)
Extremadura	4 (17.9)	212 (536.1)	448 (1617.8)	225 (2305.8)	218 (1899.0)
Galicia	13 (29.5)	525 (531.1)	1206 (1623.1)	745 (2581.4)	671 (1997.1)
Valencian region	65 (64.4)	907 (459.7)	2161 (1697.8)	1346 (3008.5)	1299 (3180.0)
Sweden	159 (72.7)	1429 (465.7)	3570 (1481.3)	2018 (2205.9)	1349 (1687.9)
The Netherlands	260 (66.3)	2754 (503.1)	6358 (1366.2)	3386 (2399.2)	2625 (2272.1)
UK, All countries[a]		11 654 (547.5)	21 481 (1351.9)	9917 (1836.7)	8035 (1638.1)
England[a]		9692 (539.3)	17 973 (1357.5)	8290 (1847.6)	6720 (1631.3)
Northern Ireland[a]		348 (555.9)	571 (1321.1)	312 (2178.8)	263 (2242.1)
Scotland	94 (80.0)	1080 (618.0)	1880 (1324.1)	786 (1658.6)	594 (1464.1)
Wales[a]		534 (567.9)	1057 (1324.4)	529 (1790.2)	458 (1743.4)
All countries	2071 (51.87)	42 314 (479.4)	95 383 (1429.2)	51 632 (2309.8)	48 688 (2277.5)

[a]Patients <20 years of age are not reported.
[b]The overall prevalence of RRT is underestimated by ∼11% due to an estimated 25–30% under-reporting of patients living on a functioning graft.
[c]The overall prevalence of RRT is underestimated by ∼3% due to an estimated 30% under-reporting of patients living on a functioning graft.

Table 6. Prevalence of RRT on 31 December 2010 among patients aged 0–19, by age group, as counts (*N*) and pmarp, unadjusted

Cohort	0–4 years *N* (pmarp)	5–9 years *N* (pmarp)	10–14 years *N* (pmarp)	15–19 years *N* (pmarp)	0–19 years *N* (pmarp)
All countries	185 (19.9)	313 (34.1)	509 (55.8)	1019 (105.3)	2026 (54.4)

ranging from 952 pmp in Romania to 3902 pmp in Dutch-speaking Belgium. Table 6 shows the prevalence for the age group 0–19 years, averaged for 2009 and 2010.

As presented in Table 7, the prevalence of HD at 31 December 2010 was highest in Portugal (955 pmp) and Greece (800 pmp) and lowest in Ukraine (92 pmp) and Russia (132 pmp). The prevalence of PD was highest in Spain, Galicia (99 pmp) and Denmark (98 pmp), whereas the lowest prevalence of this treatment was reported in Russia (12 pmp) and FYR of Macedonia (13 pmp). Finally, the prevalence of patients living on a functioning graft was highest in Spain, the Basque country (623 pmp) and Spain, Catalonia (613 pmp).

Renal transplants

The overall number of renal transplantations performed in 2010 among all registries reporting to the ERA–EDTA Registry was 21 740 (29.2 pmp). Of these, 14 261 (19.2 pmp) renal transplantations were performed with a kidney obtained from a deceased donor, 4312 (5.8 pmp) with a kidney from a living donor and for 6137 (4.3 pmp) transplantations the type of donor was unknown. Figure 4 shows that the highest overall transplant rates were reported from Spain, Cantabria (73 pmp), Spain, Catalonia (62 pmp), and Spain, Basque country (56 pmp). Countries with the highest transplant rates with living donor kidneys included the Netherlands (28 pmp), UK, Northern Ireland (23 pmp), Sweden (18 pmp) and Denmark (18 pmp).

Patient and graft survival

Survival analysis used the data from 19 registries in 12 countries that provided individual patient records for the period from 2001 to 2008. Four Spanish regions were also included in the analyses based on the cohort 2004–08

Table 7. Prevalence of RRT on 31 December 2010 by treatment modality for countries/regions providing individual patient data/and for countries/regions providing aggregated data, as counts (*N*) and per million population (pmp), unadjusted

Country	HD *N* (pmp)	PD *N* (pmp)	Tx *N* (pmp)	Unkn/Miss *N* (pmp)
Regions providing individual patient data				
Austria	3872 (461.5)	384 (45.8)	4099 (488.6)	0 (0)
Belgium				
Dutch-speaking[a]	3926 (625.2)	398 (63.4)	2998 (477.4)	0 (0)
French-speaking[a]	3091 (669.6)	292 (63.3)	2329 (504.5)	0 (0)
Denmark	2042 (364.4)	550 (98.1)	2130 (380.1)	23 (4.1)
Finland	1411 (263.1)	320 (59.7)	2511 (468.2)	0 (0)
France (20 of 26 regions)	25 744 (550.6)	2139 (45.7)	21 110 (451.5)	355 (7.6)
Greece	9048 (800.2)	755 (66.8)	2409 (213.0)	0 (0)
Iceland	60 (188.7)	12 (37.7)	118 (371.0)	0 (0)
Italy (8 of 20 regions)[b]	10 583 (678.9)	1208 (77.5)	4798 (307.8)	6 (0.4)
Norway	1000 (204.5)	220 (45.0)	2975 (608.5)	0 (0)
Romania	9707 (452.8)	1525 (71.1)	853 (39.8)	0 (0)
Spain				
Andalusia	4102 (488.5)	361 (43.0)	4095 (487.6)	0 (0)
Aragon	636 (472.3)	39 (29.0)	804 (597.0)	1 (0.7)
Asturias[b]	406 (374.4)	63 (58.1)	608 (560.7)	0 (0)
Basque country	749 (343.3)	187 (85.7)	1360 (623.4)	0 (0)
Canary Islands[b]	1268 (597.4)	132 (62.2)	1036 (488.1)	1 (0.5)
Cantabria[a]	190 (320.6)	40 (67.5)	304 (512.9)	0 (0)
Castile and León[a]	1100 (429.9)	162 (63.3)	1325 (517.8)	22 (8.6)
Castile-La Mancha[a]	857 (406.8)	95 (45.1)	1074 (509.8)	9 (4.3)
Catalonia[b]	3970 (528.5)	357 (47.5)	4601 (612.5)	0 (0)
Extremadura[b]	560 (505.3)	65 (58.6)	482 (434.9)	0 (0)
Galicia[b]	1445 (516.7)	278 (99.4)	1437 (513.8)	0 (0)
Valencian region	3214 (628.8)	241 (47.1)	2323 (454.4)	0 (0)
Sweden	2930 (312.4)	848 (90.4)	4746 (506.1)	1 (0.1)
The Netherlands	5222 (314.3)	1135 (68.3)	9025 (543.2)	1 (0.1)
UK, All countries[a,b]	22 970 (368.9)	3960 (63.6)	23 235 (373.2)	922 (14.8)
England[a,b]	19 215 (367.9)	3392 (64.9)	19 166 (366.9)	902 (17.3)
Northern Ireland[a,b]	744 (413.4)	69 (38.3)	680 (377.8)	1 (0.6)
Scotland	1909 (365.5)	292 (55.9)	2225 (426.1)	8 (1.5)
Wales[a,b]	1113 (370.2)	218 (72.5)	1236 (411.1)	11 (3.7)
All countries	120 114 (469.7)	15 777 (61.7)	102 857 (402.2)	1341 (5.2)
Regions providing aggregated data				
Bosnia and Herzegovina	2305 (657.1)	111 (31.6)	166 (47.3)	9 (2.6)
Croatia	2692 (606.7)	234 (52.7)	1250 (281.7)	0 (0)
Czech Republic	5820 (552.5)	498 (47.3)	3900 (370.3)	0 (0)
Estonia	237 (176.9)	76 (56.7)	398 (297.0)	0 (0)
France (23 of 26 regions)	34 850 (550.8)	2579 (40.8)	29 841 (471.6)	0 (0)
FYR of Macedonia	1312 (648.9)	26 (12.9)	140 (69.2)	0 (0)
Israel[b]	5175 (678.9)	341 (44.7)		0 (0)
Italy (14 of 20 regions)[b]	28 861 (751.1)	2535 (66.0)		3413 (88.8)
Latvia	414 (185.7)	110 (49.3)	458 (205.5)	0 (0)
Montenegro	112 (180.6)	13 (21.0)	81 (130.6)	0 (0)
Poland	17 193 (474.7)	1099 (30.3)	8042 (222.0)	0 (0)
Portugal	10 152 (955.3)	660 (62.1)	5976 (562.3)	0 (0)
Russia	18 722 (131.9)	1757 (12.4)	5848 (41.2)	0 (0)
Serbia	4081 (542.1)	468 (62.2)	997 (132.4)	0 (0)
Slovakia[b]	2918 (553.4)	102 (19.3)		0 (0)
Spain (18 of 19 regions)	21 680 (475.8)	2410 (52.9)	23 140 (507.9)	0 (0)
Turkey	41 296 (671.5)	4393 (71.4)	6422 (104.4)	0 (0)
Ukraine	4181 (92.2)	650 (14.3)	772 (17.0)	0 (0)
All countries	202 001 (414.0)	18 062 (37.0)	87 431 (200.2)	3422 (7.0)

HD, haemodialysis; PD, peritoneal dialysis; Tx, transplant; Unkn/Miss, unknown/missing.
[a]Patients <20 years of age are not reported.
[b]Data include dialysis patients only.

because for these registries, complete data were available from 2002. In Table 8, we present the results of the unadjusted and adjusted survival analyses for all countries together. The adjusted analyses used fixed values for age, gender and distribution of primary renal disease (PRD). The precise methodology of the survival analyses is described in the Appendix.

To calculate the expected remaining lifetimes, we used data from 19 national and regional renal registries in 12 countries that provided individual patient records from 2001 until 2010 (Table 9). The expected remaining lifetimes for patients on RRT are much lower than for the general population, whereas those of dialysis patients are even more reduced than those of transplant recipients. The size of the reduction does, however, depend on the patient's age category: the younger the patient, the more his/her remaining lifetime in years will be reduced.

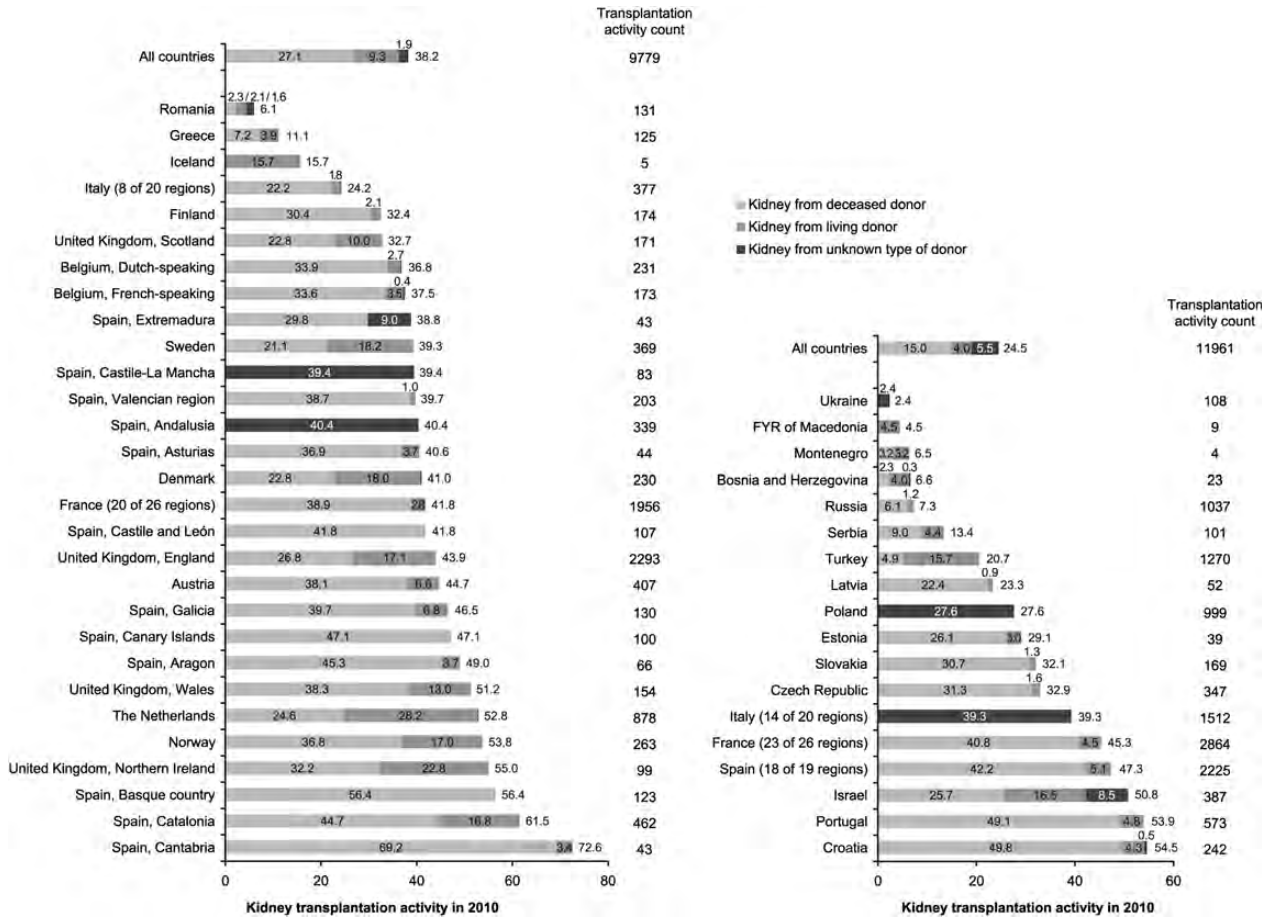

Fig. 4. Renal transplants performed pmp in 2010, by donor type, unadjusted. Figures include data from renal registries providing individual patient data (left figure) and aggregated data (right figure). For Romania, the transplantation activity reflects 70% of the total transplantation activity in the country, because there is an under-reporting of pre-emptive transplantations. We used data from NHS Blood and Transplant Service, Centro Nazionale Trapianti, the Slovak Centre of Organ Transplantation and the Organización Nacional de Trasplantes (ONT) for UK, Italy (14 of 20 regions), Slovakia and Spain (18 of 19 regions), respectively.

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Conflict of interest statement. None declared.

Appendix

Statistical methods

Table 8 presents data on the survival of incident patients on RRT and of patients receiving a first transplant between 2001 and 2005 or between 2004 and 2008 with 95% CIs. Patients were followed until 31 December 2010. Statistical analysis of unadjusted survival was performed by the Kaplan–Meier method, while for the adjusted survival analyses the Cox regression model was used.

For the analysis of patient survival on RRT, the day of the start of RRT was taken as the starting point and the event studied was death. Censored observations were recovery of renal function, loss to follow-up and end of follow-up time. Regarding the analysis of patient survival on dialysis, the first day on dialysis was the starting point, the event was death and reasons for censoring were recovery of renal function, loss to follow-up, end of follow-up time and renal transplantation. In the Cox regression model, we adjusted for fixed values of age (60 years), gender (60% men) and PRD (20% diabetes mellitus, 17% hypertension/renal vascular disease, 15% glomerulonephritis and 48% other causes).

For the analysis of patient and graft survival after transplantation, the date of the first renal transplantation was defined as the first day of follow-up. The event studied for the patient survival after transplantation was death, while for the graft survival the events were graft failure and death. The reasons for censoring were loss to follow-up and end of follow-up time. In the adjusted analyses, we adjusted for fixed values of age (45 years), gender (60% men) and PRD (10% diabetes mellitus, 8% hypertension/renal vascular disease, 28% glomerulonephritis and 54% other causes). Patients for whom age, gender or PRD was missing were excluded.

Affiliated registries

Belgium, Dutch-speaking: B. De Moor and H. Augustijn; Belgium, French-speaking: J.M. des Grottes; Bosnia-

Table 8. The 1-, 2- and 5-year survival probabilities (95% CI) for patients who started RRT/dialysis or underwent renal transplantation between 2000 and 2004 and between 2004 and 2008

	Cohort 2001–2005[a]			Cohort 2004–2008[b]	
	1 year	2 year	5 year	1 year	2 year
Patient survival on RRT					
Unadjusted	80.6 (80.4–80.8)	69.1 (68.9–69.3)	46.2 (46.0–46.3)	82.2 (82.0–82.4)	71.3 (71.1–71.5)
Adjusted[c]	87.7 (87.5–87.9)	79.0 (78.7–79.3)	57.1 (56.7–57.5)	88.7 (88.5–88.9)	80.7 (80.5–81.0)
Patient survival on dialysis					
Unadjusted	79.9 (79.7–80.1)	67.1 (66.8–67.3)	38.6 (38.5–38.8)	81.3 (81.1–81.5)	69.2 (69.0–69.4)
Adjusted[c]	85.9 (85.7–86.2)	76.0 (75.7–76.3)	50.3 (49.8–50.8)	87.5 (87.3–87.7)	78.5 (78.2–78.8)
Patient survival after first transplant (deceased donor)					
Unadjusted	95.5 (95.2–95.8)	93.4 (93.0–93.8)	86.6 (86.1–87.1)	95.9 (95.6–96.2)	94.0 (93.7–94.4)
Adjusted[d]	97.1 (96.9–97.4)	95.7 (95.4–96.0)	91.0 (90.5–91.5)	97.4 (97.1–97.6)	96.1 (95.8–96.4)
Patient survival after first transplant (living donor)					
Unadjusted	97.6 (97.0–98.0)	96.6 (96.0–97.1)	94.1 (93.4–94.8)	98.3 (97.9–98.6)	97.5 (97.0–97.9)
Adjusted[d]	97.7 (97.2–98.2)	96.8 (96.2–97.4)	94.2 (93.4–95.1)	98.5 (98.2–98.9)	97.8 (97.4–98.3)
Graft survival after first transplant (deceased donor)					
Unadjusted	89.6 (89.2–90.1)	86.6 (86.1–87.1)	76.9 (76.4–77.5)	90.2 (89.7–90.6)	87.4 (86.9–87.8)
Adjusted[d]	90.7 (90.2–91.2)	87.9 (87.4–88.5)	78.9 (78.2–79.7)	91.1 (90.7–91.6)	88.6 (88.1–89.1)
Graft survival after first transplant (living donor)					
Unadjusted	93.8 (93.0–94.4)	91.8 (91.0–92.6)	85.9 (84.9–86.8)	94.8 (94.2–95.3)	92.9 (92.2–93.5)
Adjusted[d]	93.5 (92.7–94.3)	91.4 (90.5–92.4)	85.2 (83.9–86.4)	94.4 (93.8–95.1)	92.5 (91.7–93.2)

[a]Based on the data from Austria, Belgium (Dutch-speaking), Belgium (French-speaking), Denmark, Finland, Greece, Iceland, Italy (Calabria), Norway, Spain (Andalusia), Spain (Asturias), Spain (Basque country), Spain (Cantabria), Spain (Catalonia), Spain (Valencian region), Sweden, the Netherlands, UK (England and Wales) and UK (Scotland).
[b]Based on the data from Austria, Belgium (Dutch-speaking), Belgium (French-speaking), Denmark, Finland, Greece, Iceland, Italy (Calabria), Norway, Spain (Andalusia), Spain (Aragon), Spain (Asturias), Spain (Basque country), Spain (Cantabria), Spain (Castile and León), Spain (Castile-La Mancha), Spain (Catalonia), Spain (Extremadura), Spain (Valencian region), Sweden, the Netherlands, UK (England and Wales) and UK (Scotland).
[c]Analyses were adjusted using fixed values: age (60 years), gender (60% men) and PRD (20% diabetes mellitus, 17% hypertension/renal vascular disease, 15% glomerulonephritis and 48% other causes).
[d]Analyses were adjusted using fixed values: age (45 years), gender (60% men) and PRD (10% diabetes mellitus, 8% hypertension/renal vascular disease, 28% glomerulonephritis and 54% other causes).

Table 9. Expected remaining lifetimes (years) of the general population in 2005, and of prevalent dialysis and transplant patients in 2009 and 2010 (includes mortality in the first 90 days)[a]

General population				Dialysis patients				Transplant patients			
Age	All	Men	Women	Age	All	Men	Women	Age	All	Men	Women
0	79.4	76.7	81.9	0–19	36.5	37.9	34.4	0–19	61.4	61.0	62.1
5	74.8	72.2	77.3								
10	69.8	67.2	72.3								
15	64.9	62.2	67.4								
20	60.0	57.4	62.4	20–24	19.9	20.6	18.9	20–24	43.5	42.8	44.9
25	55.1	52.6	57.5	25–29	17.1	17.5	16.4	25–29	39.2	38.5	40.4
30	50.3	47.8	52.6	30–34	14.6	14.8	14.2	30–34	35.1	34.3	36.4
35	45.4	43.0	47.7	35–39	12.4	12.5	12.3	35–39	31.0	30.2	32.5
40	40.6	38.3	42.9	40–44	10.7	10.6	10.7	40–44	27.0	26.2	28.3
45	35.9	33.6	38.1	45–49	9.2	9.2	9.3	45–49	23.1	22.4	24.5
50	31.3	29.1	33.4	50–54	7.8	7.7	7.9	50–54	19.7	19.0	20.8
55	26.9	24.7	28.8	55–59	6.7	6.6	6.9	55–59	16.4	15.8	17.3
60	22.6	20.6	24.4	60–64	5.6	5.5	5.8	60–64	13.4	13.0	14.0
65	18.6	16.7	20.1	65–69	4.9	4.8	5.1	65–69	10.4	10.1	10.9
70	14.8	13.1	16.1	70–74	4.2	4.1	4.3	70–74	7.8	7.7	8.1
75	11.3	10.0	12.3	75–79	3.4	3.4	3.5				
80	8.4	7.4	9.0	80–84	2.5	2.5	2.5				
85	6.2	5.5	6.5								

[a]Based on the data from Austria, Belgium (Dutch-speaking), Belgium (French-speaking), Denmark, Finland, Greece, Iceland, Italy (Calabria), Norway, Spain (Andalusia), Spain (Asturias), Spain (Basque Country), Spain (Cantabria), Spain (Catalonia), Spain (Valencian region), Sweden, the Netherlands, UK (England and Wales), UK (Scotland).

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