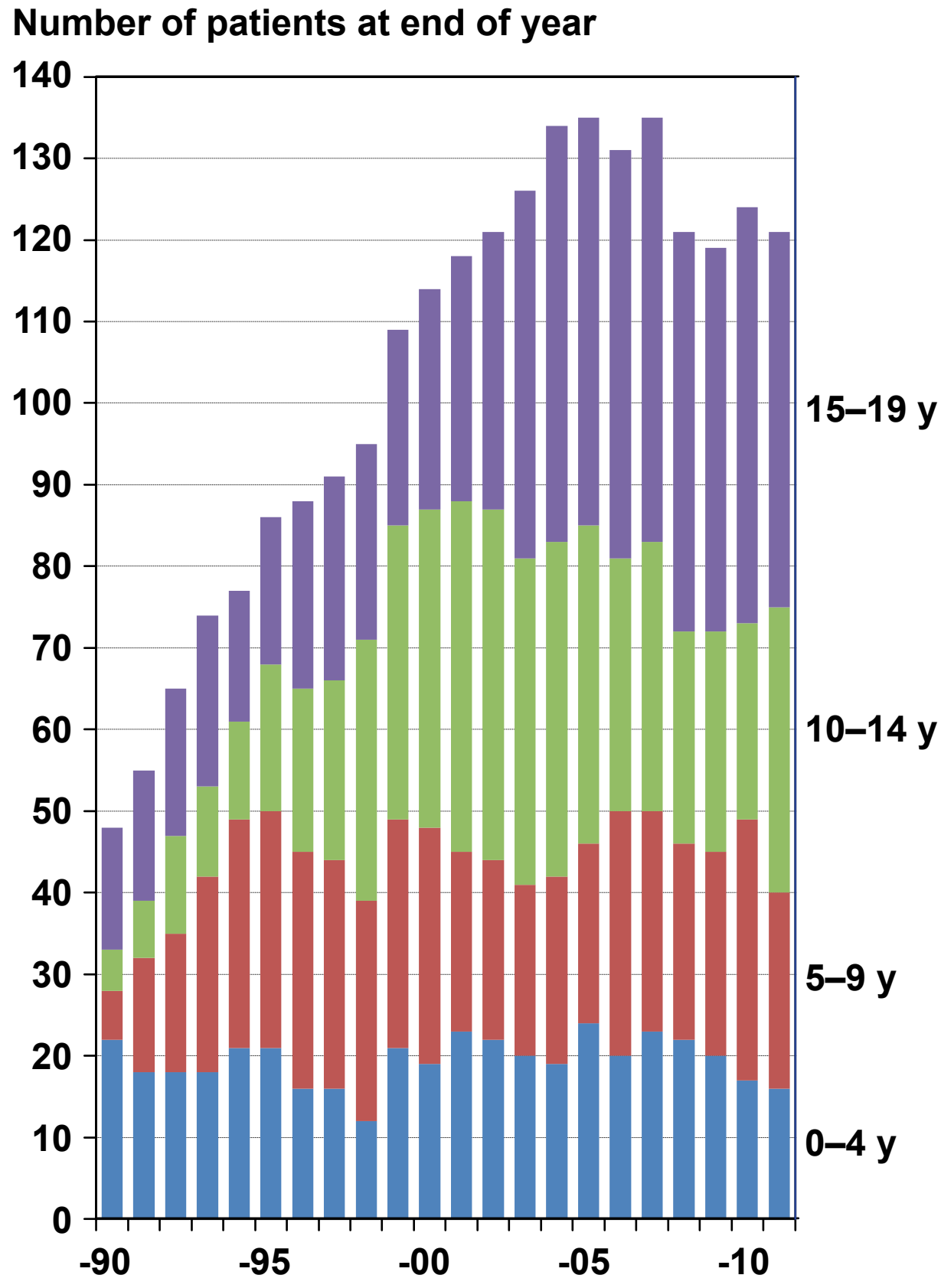
Report 2011

Finnish Registry for Kidney Diseases



Finnish Registry for Kidney Diseases – Report 2011

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Finnish Registry for Kidney Diseases 2011

Report 2011 of the Finnish Registry for Kidney Diseases presents current data regarding renal replacement therapy (RRT) in Finland. The term RRT includes both dialysis and kidney transplantation. The registry holds data on RRT patients since 1965. At the end of 2011, the registry contained information on 12 715 RRT patients, 4326 of whom were alive.

The annual number of patients entering RRT increased until the year 2004, exceeding 500 new patients a year. In recent years, the incidence has been approximately 10% lower. The number of new RRT patients younger than 65 years has decreased, while the number of patients older than 65 years has stabilized. The Finnish population is forecasted to increase and become older. Consequently, the number of patients entering RRT is expected to rise.

Approximately three-quarters of new RRT patients enter in-center hemodialysis as the first dialysis modality. One of four enters peritoneal dialysis and 2% home hemodialysis. Only very few receive a kidney transplant without a preceding period of dialysis. According to Table 5 on page 11, the proportions of various dialysis modalities at the start of RRT vary considerably across healthcare districts.

The number of patients on RRT has increased continuously. The growth has slowed down during recent years, but still persists. At the end of 2011, there were 2552 kidney transplantation patients and 1774 dialysis patients in Finland. The proportion of kidney transplantation patients has not differed markedly between healthcare districts, and dialysis patients appear to have an equal chance to receive a kidney transplant regardless of their location in the country. On the other hand, as shown on page 18, the distribution of dialysis modalities has varied considerably. In some healthcare districts, more than 30% of all dialysis patients perform dialysis at home (peritoneal dialysis or home hemodialysis), while in several districts this proportion remained under 15%.

In 2011, 25 years had passed since the first kidney transplantation was performed at the Children's Hospital in Helsinki. In honor of this, the theme of this report is pediatric nephrology, and special theme-related analyses are provided on pages 23–31. In Finland, the incidence and prevalence of RRT among children younger than 15 years are the highest in the world. This is due to the congenital nephrotic syndrome of the Finnish type, which is the most common cause of end-stage renal disease among Finnish children. At the end of 2011, 88% of all RRT patients younger than 20 years had a functioning kidney graft, and this proportion was among the highest in Europe (Report 2010 of the ESPN/ERA-EDTA Registry, www.espn-reg.org).

The Finnish Registry for Kidney Diseases is a national healthcare registry financed by the Finnish government through the National Institute for Health and Welfare. The Finnish Kidney and Liver Association is responsible for the technical maintenance of the registry. Statistics in this report were updated using data obtained from the Registry for the Follow-up of Kidney Transplantation Patients, maintained by the Kidney Transplantation Unit of Helsinki University Central Hospital. This registry also provided data on kidney donor type for the analysis of pediatric nephrology presented in this report. The Board of the Finnish Registry for Kidney Diseases thanks all supporters and participating hospitals for excellent cooperation.

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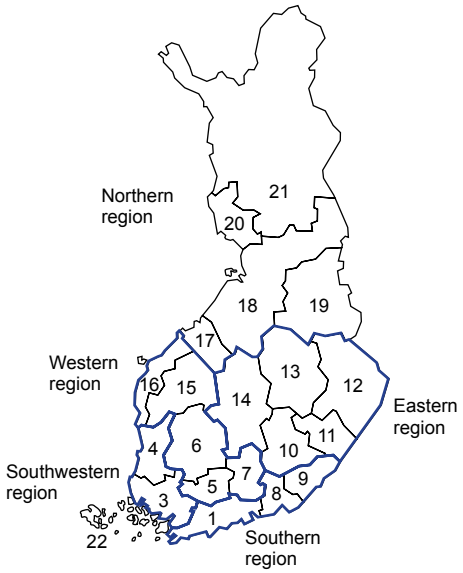
Table 1. The Finnish population and its distribution in healthcare districts
Finnish Registry for Kidney Diseases 2001–2011

Healthcare district		Year					Change (%) 2001–2011
		2001	2006	2009	2010	2011	
1	Helsinki-Uusimaa	1405	1463	1514	1528	1545	10.0
3	Varsinais-Suomi	453	461	466	468	470	3.9
4	Satakunta	231	228	226	226	225	–2.6
5	Kanta-Häme	166	170	174	175	175	5.9
6	Pirkanmaa	450	470	482	486	490	8.7
7	Päijät-Häme	209	211	212	213	213	2.0
8	Kymenlaakso	179	177	176	175	175	–2.5
9	Etelä-Karjala	136	134	133	133	133	–2.7
10	Etelä-Savo	112	109	107	106	105	–5.7
11	Itä-Savo	49	47	46	46	45	–7.7
12	Pohjois-Karjala	175	172	170	170	170	–3.2
13	Pohjois-Savo	253	249	248	248	248	–1.9
14	Keski-Suomi	267	270	273	274	274	2.9
15	Etelä-Pohjanmaa	200	199	198	198	199	–0.5
16	Vaasa	161	162	165	166	167	3.9
17	Keski-Pohjanmaa	74	74	75	75	75	0.9
18	Pohjois-Pohjanmaa	375	387	396	398	401	6.9
19	Kainuu	84	81	79	79	78	–7.7
20	Länsi-Pohja	68	66	65	65	65	–4.1
21	Lappi	121	119	118	118	118	–2.6
22	Åland	26	27	28	28	28	9.0
Region	South	1720	1775	1822	1837	1852	7.7
	Southwest	710	716	720	722	724	1.9
	West	1186	1212	1232	1238	1244	4.9
	East	855	847	843	843	843	–1.5
	North	723	727	733	736	738	2.0
Entire country		5195	5277	5351	5375	5401	4.0

Figure 1. Healthcare districts and regions in Finland
Finnish Registry for Kidney Diseases 2011



On 31 December 2011, the population of Finland was 5.401 million (Table 1, Source: Statistics Finland). During the past ten years the population of the country has increased by 4.0%, with the fastest increase occurring in the southern region. The population in the eastern region has decreased. Of the healthcare districts, the population has increased most in Helsinki-Uusimaa, Ahvenanmaa, Pirkanmaa, and Pohjois-Pohjanmaa. In the healthcare districts of Kainuu, Itä-Savo, and Etelä-Savo, the population has decreased especially rapidly.

The numbers in Figure 1 refer to the healthcare districts listed in Table 1. In this report, “region” refers to a university hospital region.

Figure 2. Age structure of the Finnish population
Finnish Registry for Kidney Diseases 1991–2011

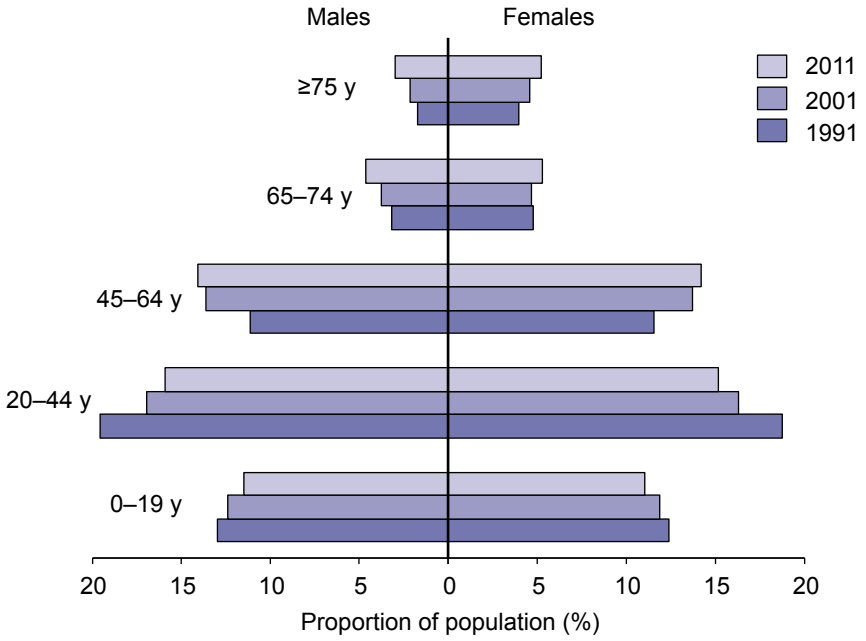


Figure 2 (Source: Statistic Finland) shows the change in the age distribution of the Finnish population since 1991. The population has become older. The proportion of inhabitants older than 45 years has increased and that of inhabitants younger than 45 years has decreased. In 1991–2011, the proportion of inhabitants older than 65 years increased from 14% to 18%, while the proportion of inhabitants younger than 20 years decreased from 25% to 23%. According to the projection of Statistics Finland, the proportion of inhabitants older than 65 years will be 26% in 2030.

Table 2. Number of new RRT patients and incidence of RRT by healthcare district and region
Finnish Registry for Kidney Diseases 2001–2011

Healthcare district		Number of new RRT patients						Incidence of RRT/million inhabitants					
		2001	2006	2009	2010	2011	2007–2011 on average	2001	2006	2009	2010	2011	2007–2011 on average
1	Helsinki-Uusimaa	100	90	107	108	111	109	71	62	71	71	72	72
3	Varsinais-Suomi	45	47	32	33	38	41	99	102	69	70	81	88
4	Satakunta	24	22	25	19	21	24	104	96	111	84	93	107
5	Kanta-Häme	18	8	17	20	29	19	109	47	98	115	165	112
6	Pirkanmaa	46	56	53	44	46	49	102	119	110	91	94	103
7	Päijät-Häme	20	20	14	22	18	20	96	95	66	103	84	96
8	Kymenlaakso	14	22	13	17	8	18	78	124	74	97	46	101
9	Etelä-Karjala	11	14	13	21	13	17	81	104	98	158	98	129
10	Etelä-Savo	12	10	14	8	8	9	107	92	131	76	76	84
11	Itä-Savo	1	8	9	5	5	5	20	169	196	110	111	113
12	Pohjois-Karjala	16	14	15	14	13	15	91	82	88	82	77	86
13	Pohjois-Savo	38	22	25	20	32	27	150	88	101	81	129	107
14	Keski-Suomi	25	23	19	24	22	23	94	85	70	88	80	85
15	Etelä-Pohjanmaa	17	19	16	17	24	17	85	96	81	86	121	87
16	Vaasa	7	7	15	16	16	16	43	43	91	96	96	96
17	Keski-Pohjanmaa	6	10	13	7	4	7	81	135	174	93	53	91
18	Pohjois-Pohjanmaa	49	30	28	35	21	30	131	77	71	88	52	77
19	Kainuu	8	14	5	6	5	6	95	173	63	76	64	76
20	Länsi-Pohja	7	11	6	5	3	7	103	166	92	77	46	107
21	Lappi	7	9	7	5	15	8	58	76	59	42	127	68
22	Åland	2	1	3	2	4	3	77	37	108	71	141	115
Region	South	125	126	133	146	132	144	73	71	73	79	71	79
	Southwest	71	70	60	54	63	68	100	98	83	75	87	95
	West	108	110	115	119	133	122	91	91	93	96	107	99
	East	92	77	82	71	80	79	108	91	97	84	95	93
	North	77	74	59	58	48	58	106	102	80	79	65	79
Entire country		473	457	449	448	456	471	91	87	84	83	84	88
	Children <15 y	11	7	6	8	6	7	12	8	7	9	7	8

Table 2 shows the number of new RRT patients and the incidence of RRT according to healthcare district and region. In the entire country, the incidence in 2011 was similar to that in 2009 and 2010, but 7% lower than in 2001 and 3% lower than in 2006.

In 2007–2011, the average incidence was highest in the western region and lowest in the southern and northern regions. In the healthcare districts, the average incidence in 2007–2011 was lowest in Lapland (68 new RRT patients/million inhabitants) and highest in Etelä-Karjala (129/million inhabitants).

Table 3. Number of new RRT patients by age group in healthcare districts and regions
Finnish Registry for Kidney Diseases 2007–2011

Healthcare district		Average annual number of new RRT patients in 2007–2011 by age group (y)						Incidence*/million inhabitants in 2007–2011 by age group (y)					
		0–19	20–44	45–64	65–74	≥75	Total	0–19	20–44	45–64	65–74	≥75	Total
1	Helsinki-Uusimaa	2.4	16.6	47.2	26.2	16.6	109	7	31	114	223	189	72
3	Varsinais-Suomi	0.6	5.6	17.4	11.8	5.4	41	6	38	132	267	132	88
4	Satakunta	0.2	3.2	10.2	6.6	4.0	24	4	51	150	268	180	107
5	Kanta-Häme	0	2.8	7.0	4.6	5.0	19	0	56	137	273	320	112
6	Pirkanmaa	0.4	5.0	18.0	14.8	11.2	49	4	31	136	338	287	103
7	Päijät-Häme	0	3.8	6.6	5.2	4.8	20	0	63	102	230	259	96
8	Kymenlaakso	0.2	2.8	6.6	4.6	3.6	18	5	58	121	242	209	101
9	Etelä-Karjala	0.2	0.8	6.2	5.0	5.0	17	7	22	152	341	375	129
10	Etelä-Savo	0.2	1.2	4.0	2.2	1.4	9	9	45	117	177	123	84
11	Itä-Savo	0.2	0.4	1.6	1.6	1.4	5	22	36	107	286	263	113
12	Pohjois-Karjala	0.2	2.0	4.4	5.0	3.0	15	5	43	82	284	186	86
13	Pohjois-Savo	1.2	3.8	10.8	6.4	4.4	27	22	54	143	260	189	107
14	Keski-Suomi	0.2	3.4	8.8	6.0	4.8	23	3	41	113	232	209	85
15	Etelä-Pohjanmaa	1.0	1.4	6.2	4.4	4.2	17	21	26	108	230	214	87
16	Vaasa	1.6	1.8	4.4	4.4	3.6	16	41	35	100	283	233	96
17	Keski-Pohjanmaa	0.4	1.0	2.8	1.8	0.8	7	21	46	135	261	124	91
18	Pohjois-Pohjanmaa	0.6	5.2	12.8	6.4	5.4	30	6	41	124	205	205	77
19	Kainuu	0	1.0	2.8	1.4	0.8	6	0	49	110	164	103	76
20	Länsi-Pohja	0.2	0.8	1.8	2.2	2.0	7	13	45	88	345	339	107
21	Lappi	0.4	0.4	3.4	3.0	0.8	8	15	12	90	246	81	68
22	Åland	0	0.4	1.4	0.8	0.6	3	0	47	175	301	259	115
Alue	South	2.8	20.2	60.0	35.8	25.2	144	7	32	118	237	212	79
	Southwest	0.8	9.2	29.0	19.2	10.0	68	5	42	139	268	153	95
	West	3.0	14.8	42.2	33.4	28.8	122	11	39	121	283	266	99
	East	2.0	10.8	29.6	21.2	15.0	79	11	45	116	246	190	93
	North	1.6	8.4	23.6	14.8	9.8	58	9	39	114	227	174	79
Entire country		10.2	63.4	184.4	124.4	88.8	471	8	38	121	253	208	88

*Average annual incidence of RRT in subgroup

Table 3 presents the average number of new RRT patients and incidence of RRT in 2007–2011 according to healthcare district, region, and age group. In most healthcare districts, the incidence was highest among 65–74-year-olds. In the age group of 75 years and older, the incidence varied considerably between healthcare districts, and a significant difference emerged between the regions. In small healthcare districts, chance can cause great variability in the incidence rates.

Table 4. Incidence of RRT by age group and gender
Finnish Registry for Kidney Diseases 2001–2011

Age group		Number of new RRT patients					Incidence/million inhabitants				
		2001	2006	2009	2010	2011	2001	2006	2009	2010	2011
0–19 y	Males	10	2	6	5	3	16	3	10	8	5
	Females	7	7	2	7	8	11	12	3	12	13
	Total	17	9	8	12	11	13	7	7	10	9
20–44 y	Males	46	44	41	37	37	52	51	48	43	43
	Females	27	30	24	16	20	32	36	29	20	24
	Total	73	74	65	53	57	42	44	39	32	34
45–64 y	Males	119	109	123	119	115	168	147	160	155	151
	Females	74	54	62	48	61	104	72	80	62	80
	Total	193	163	185	167	176	136	109	120	109	115
65–74 y	Males	65	81	78	91	86	334	380	348	387	343
	Females	59	38	40	41	42	242	151	154	152	147
	Total	124	119	118	132	128	283	256	244	261	239
≥75 y	Males	34	57	49	57	56	306	412	323	364	348
	Females	32	35	24	27	28	134	132	87	97	99
	Total	66	92	73	84	84	189	228	171	193	189
Total	Males	274	293	297	309	297	108	113	113	117	112
	Females	199	164	152	139	159	75	61	56	51	58
	Total	473	457	449	448	456	91	87	84	83	84

Table 4 shows the number of new RRT patients and the incidence of RRT according to age group and gender in 2001–2011. During recent years, the incidence of RRT has been approximately twice as high in men as in women, and the difference has been especially large in those older than 75 years. In those 75 years and older, the incidence was similar in 2011 and 2001. In the age groups 45–64 and 65–74 years, the incidence had decreased by 15% in the same period. In 2011, the incidence was highest among men older than 65 years.

Figure 3. Incidence of RRT by age group and gender
Finnish Registry for Kidney Diseases 2001–2011

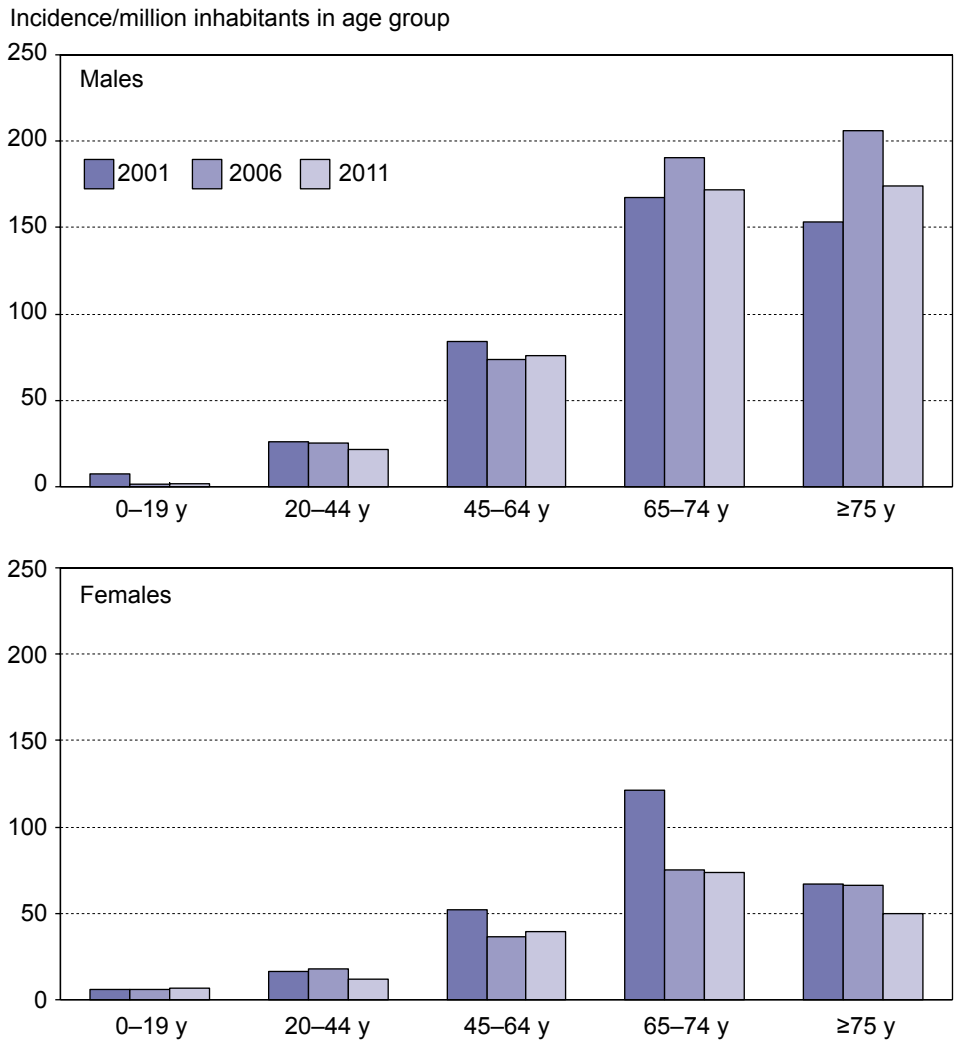


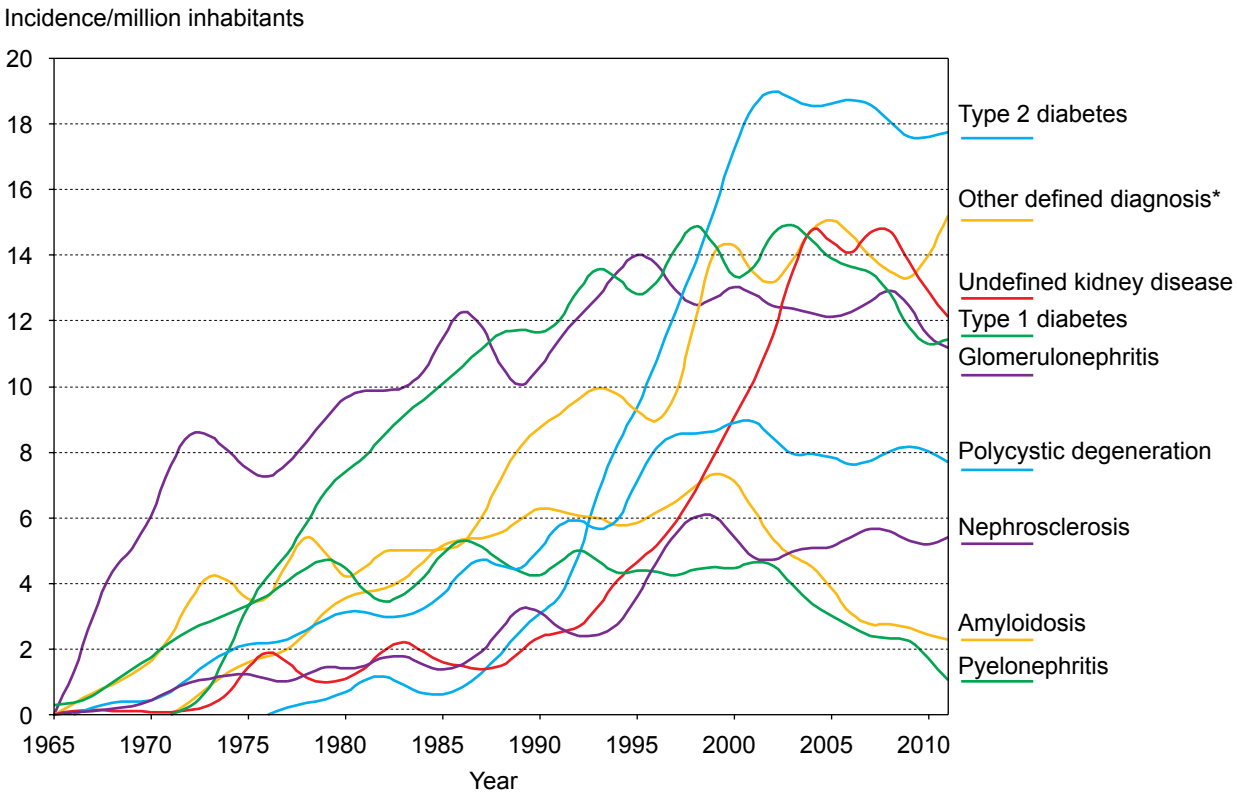
Figure 3 illustrates graphically the incidence rates of RRT presented in Table 4. Except for under 20-year-olds, the incidence in each age group was clearly higher among males than females. Among those older than 75 years, the incidence had decreased since 2006 in both men and women. Among 65–74-year-old women, the incidence of RRT was 39% lower in 2011 than in 2001. In the other age groups, no major changes in the incidence rates were observed.

Table 5. Number of new RRT patients according to type of treatment in healthcare districts
Finnish Registry for Kidney Diseases 2007–2011

Healthcare district		Average annual number of new RRT patients in 2007–2011 (%)						
		CAPD	APD	Home HD	In-center HD	HDF	Tx	Total
1	Helsinki-Uusimaa	13.8 (13)	14.0 (13)	8.6 (8)	71.6 (66)	1.0 (1)	0 (0)	109 (100)
3	Varsinais-Suomi	11.0 (27)	1.8 (4)	0 (0)	27.6 (68)	0.4 (1)	0 (0)	41 (100)
4	Satakunta	11.2 (46)	0.4 (2)	0 (0)	12.4 (51)	0.2 (1)	0 (0)	24 (100)
5	Kanta-Häme	2.0 (10)	5.4 (28)	0.2 (1)	11.6 (60)	0.2 (1)	0 (0)	19 (100)
6	Pirkanmaa	6.0 (12)	2.4 (5)	0 (0)	40.6 (82)	0.4 (1)	0 (0)	49 (100)
7	Päijät-Häme	1.2 (6)	2.0 (10)	0 (0)	17.0 (83)	0.2 (1)	0 (0)	20 (100)
8	Kymenlaakso	1.8 (10)	4.6 (26)	0 (0)	11.4 (64)	0 (0)	0 (0)	18 (100)
9	Etelä-Karjala	1.2 (7)	0 (0)	0 (0)	16.0 (93)	0 (0)	0 (0)	17 (100)
10	Etelä-Savo	1.6 (18)	0 (0)	0 (0)	7.4 (82)	0 (0)	0 (0)	9 (100)
11	Itä-Savo	0.6 (12)	0 (0)	0 (0)	4.6 (88)	0 (0)	0 (0)	5 (100)
12	Pohjois-Karjala	3.6 (25)	1.4 (10)	0 (0)	9.6 (66)	0 (0)	0 (0)	15 (100)
13	Pohjois-Savo	4.2 (16)	3.6 (14)	0.2 (1)	18.6 (70)	0 (0)	0 (0)	27 (100)
14	Keski-Suomi	3.8 (16)	0.2 (1)	0 (0)	19.2 (83)	0 (0)	0 (0)	23 (100)
15	Etelä-Pohjanmaa	2.2 (13)	0.4 (2)	0 (0)	14.4 (84)	0 (0)	0.2 (1)	17 (100)
16	Vaasa	2.0 (13)	2.4 (15)	0 (0)	11.2 (71)	0 (0)	0.2 (1)	16 (100)
17	Keski-Pohjanmaa	0.8 (12)	0.2 (3)	0 (0)	5.8 (85)	0 (0)	0 (0)	7 (100)
18	Pohjois-Pohjanmaa	2.4 (8)	4.8 (16)	0.2 (1)	22.6 (74)	0.4 (1)	0 (0)	30 (100)
19	Kainuu	0.4 (7)	1.8 (30)	0 (0)	3.8 (63)	0 (0)	0 (0)	6 (100)
20	Länsi-Pohja	1.2 (17)	0.2 (3)	0 (0)	4.8 (69)	0.8 (11)	0 (0)	7 (100)
21	Lappi	3.6 (45)	0.2 (3)	0 (0)	4.2 (53)	0 (0)	0 (0)	8 (100)
22	Åland	0 (0)	0 (0)	0 (0)	3.2 (100)	0 (0)	0 (0)	3 (100)
Region	South	16.8 (12)	18.6 (13)	8.6 (6)	99.0 (69)	1.0 (1)	0 (0)	144 (100)
	Southwest	22.2 (33)	2.2 (3)	0 (0)	43.2 (63)	0.6 (1)	0 (0)	68 (100)
	West	13.4 (11)	12.6 (10)	0.2 (0)	94.8 (78)	0.8 (1)	0.4 (0)	122 (100)
	East	13.8 (18)	5.2 (7)	0.2 (0)	59.4 (76)	0.0 (0)	0 (0)	79 (100)
	North	8.4 (14)	7.2 (12)	0.2 (0)	41.2 (71)	1.2 (2)	0 (0)	58 (100)
Entire country		74.6 (16)	45.8 (10)	9.2 (2)	337.6 (72)	3.6 (1)	0.4 (0)	471 (100)

Table 5 presents the number of patients who entered RRT in 2007–2011 according to the first type of treatment in healthcare districts and regions. In-center hemodialysis (in-center HD) was the first type of treatment among 72% of patients, with this proportion varying between 52% and 100% in the healthcare districts. Hemodiafiltration (HDF) was rarely the first type of treatment. Home hemodialysis (home HD) was the first type of treatment in 8% of the patients entering RRT in the healthcare district of Helsinki-Uusimaa and in 0–1% of patients in the other healthcare districts. Continuous ambulatory peritoneal dialysis (CAPD) was the first type of treatment in more than 40% of patients entering RRT in the healthcare districts of Satakunta and Lappi. Automatic peritoneal dialysis (APD) was most frequent in the healthcare districts of Kainuu, Kanta-Häme, and Kymenlaakso. In 2007–2011, only two patients received a kidney transplant without a preceding period of dialysis treatment; both of these patients were younger than 20 years.

Figure 4. Incidence of RRT according to diagnosis
Finnish Registry for Kidney Diseases 1965–2011



*Other systemic diseases, urinary tract obstruction, congenital diseases, and tubulointerstitial nephritis, among others

The incidence of RRT according to diagnosis appears as smoothed averages in Figure 4. From the 1960s until 1985, glomerulonephritis was the most common disease leading to RRT. In the latter half of the 1980s and in the 1990s, type 1 diabetes was as common as glomerulonephritis. In the 1990s, the number of type 2 diabetes patients entering RRT increased rapidly, but in recent years the number has stabilized. Since 1999, type 2 diabetes has been the most common cause of end-stage renal disease.

The annual number of amyloidosis patients entering RRT increased continuously up to the year 2000, thereafter decreasing substantially. The incidence of end-stage renal disease caused by pyelonephritis has also decreased, and in 2011 only three patients entered dialysis because of this disease.

Figure 5. International comparison of incidence of RRT in 2010
Finnish Registry for Kidney Diseases 2010

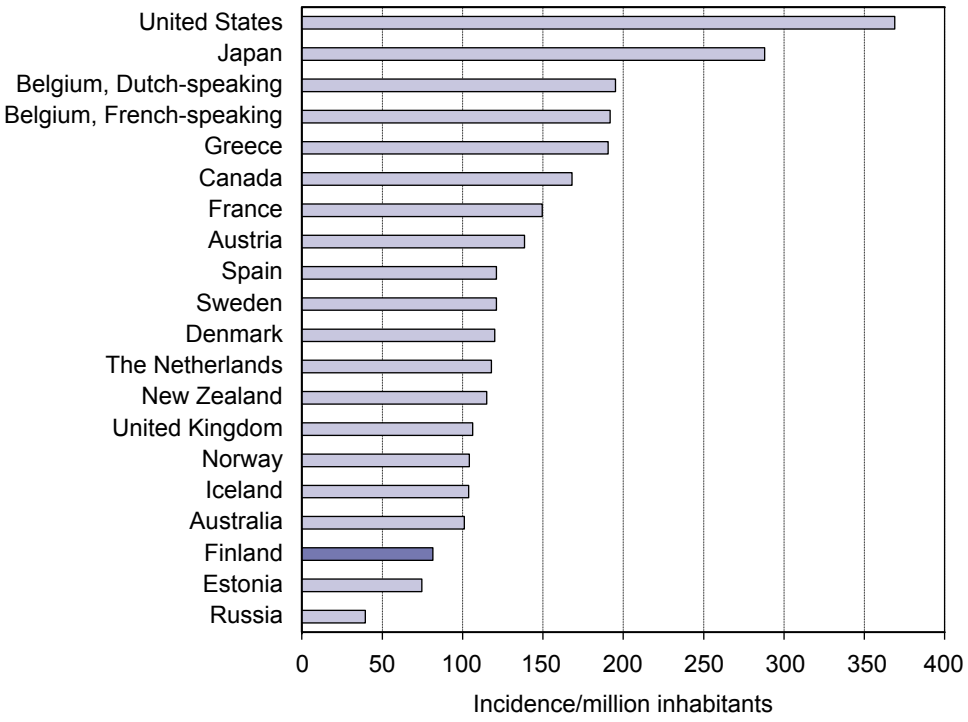


Figure 5 shows the incidence of RRT in 2010 in countries reporting to the ERA-EDTA Registry (Annual Report 2010, http://www.era-edta-reg.org) and in the United States, Canada, Australia, New Zealand, and Japan (The 2012 USRDS Annual Data Report Atlas, http://www.usrds.org). In 2010, the incidence of RRT in Finland was the lowest among the Nordic countries. Relative to Finland, the incidence in Sweden was 48% higher, in Denmark 47% higher, in Norway 28% higher, and in Iceland 27% higher.

Table 6. Patients on RRT at end of year according to healthcare district and region
Finnish Registry for Kidney Diseases 2001–2011

Healthcare district		Number of RRT patients					Prevalence of RRT/million inhabitants				
		2001	2006	2009	2010	2011	2001	2006	2009	2010	2011
1	Helsinki-Uusimaa	861	1011	1084	1124	1148	613	691	716	735	743
3	Varsinais-Suomi	295	352	394	398	404	651	763	845	850	859
4	Satakunta	164	209	234	236	230	709	916	1035	1045	1021
5	Kanta-Häme	83	112	130	135	145	501	659	748	773	827
6	Pirkanmaa	308	351	408	409	415	684	747	846	842	848
7	Päijät-Häme	102	164	172	178	175	488	779	810	836	821
8	Kymenlaakso	101	121	145	142	137	563	684	826	810	784
9	Etelä-Karjala	95	134	140	147	152	698	997	1051	1106	1147
10	Etelä-Savo	63	75	90	89	90	564	690	845	840	853
11	Itä-Savo	31	43	46	49	50	632	908	1003	1074	1105
12	Pohjois-Karjala	110	129	139	135	136	627	751	818	795	801
13	Pohjois-Savo	224	216	229	221	231	886	866	923	891	931
14	Keski-Suomi	135	156	173	182	190	507	579	634	665	692
15	Etelä-Pohjanmaa	91	110	113	120	133	456	554	569	605	669
16	Vaasa	73	98	108	117	118	453	603	653	704	705
17	Keski-Pohjanmaa	35	51	56	59	59	470	686	748	786	785
18	Pohjois-Pohjanmaa	226	272	281	288	282	602	702	710	723	703
19	Kainuu	55	73	63	62	61	651	904	795	788	782
20	Länsi-Pohja	43	56	67	64	59	634	845	1025	980	908
21	Lappi	67	79	75	74	84	551	666	634	626	710
22	Åland	18	15	23	24	27	692	557	829	857	952
Region	South	1057	1266	1369	1413	1437	615	713	751	769	776
	Southwest	477	576	651	658	661	672	804	904	911	913
	West	657	835	931	959	986	554	689	755	775	793
	East	563	619	677	676	697	658	731	803	802	827
	North	426	531	542	547	545	589	730	739	744	739
Entire country		3180	3827	4170	4253	4326	612	725	779	791	801

Table 6 presents the number of RRT patients and the prevalence of RRT on 31 December 2001–2011. In the entire country, the prevalence at the end of 2011 was 801 RRT patients per million inhabitants, and it had increased by 31% from 2001 and by 10% from 2006. On 31 December 2011, the prevalence was the highest in the southwestern region and the lowest in the northern region. In the healthcare districts, the prevalence varied between 669 and 1147 patients per million inhabitants.

Table 7. Patients on RRT according to age group and gender
Finnish Registry for Kidney Diseases 2001–2011

Age group		Number of RRT patients					Prevalence of RRT/million inhabitants				
		2001	2006	2009	2010	2011	2001	2006	2009	2010	2011
0–19 y	Males	77	77	68	70	66	120	123	109	112	106
	Females	41	54	51	54	55	66	90	85	90	92
	Total	118	131	119	124	121	94	107	97	102	99
20–44 y	Males	413	443	456	424	422	469	513	532	494	491
	Females	313	299	273	264	250	370	361	333	323	305
	Total	726	742	729	688	672	420	439	435	410	400
45–64 y	Males	915	1109	1222	1243	1236	1293	1492	1592	1624	1627
	Females	558	668	724	708	724	784	893	936	917	944
	Total	1473	1777	1946	1951	1960	1038	1192	1262	1269	1284
65–74 y	Males	344	420	540	606	648	1770	1972	2413	2575	2586
	Females	280	289	325	355	364	1150	1147	1252	1314	1276
	Total	624	709	865	961	1012	1426	1525	1790	1901	1888
≥75 y	Males	124	281	310	331	351	1116	2033	2046	2117	2179
	Females	115	187	201	198	210	482	704	729	709	743
	Total	239	468	511	529	561	683	1159	1196	1215	1264
Total	Males	1873	2330	2596	2674	2723	738	902	989	1013	1027
	Females	1307	1497	1574	1579	1603	492	556	577	577	583
	Total	3180	3827	4170	4253	4326	612	725	779	791	801

Figure 6. Standardized prevalence of RRT in regions
Finnish Registry for Kidney Diseases 2001–2011

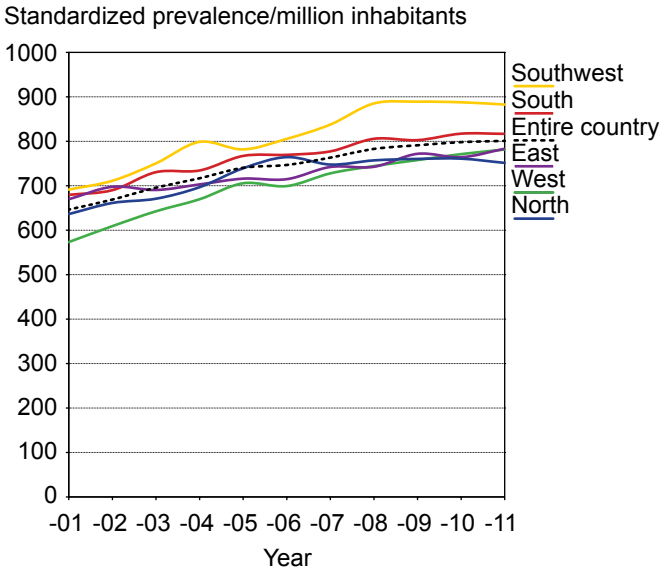
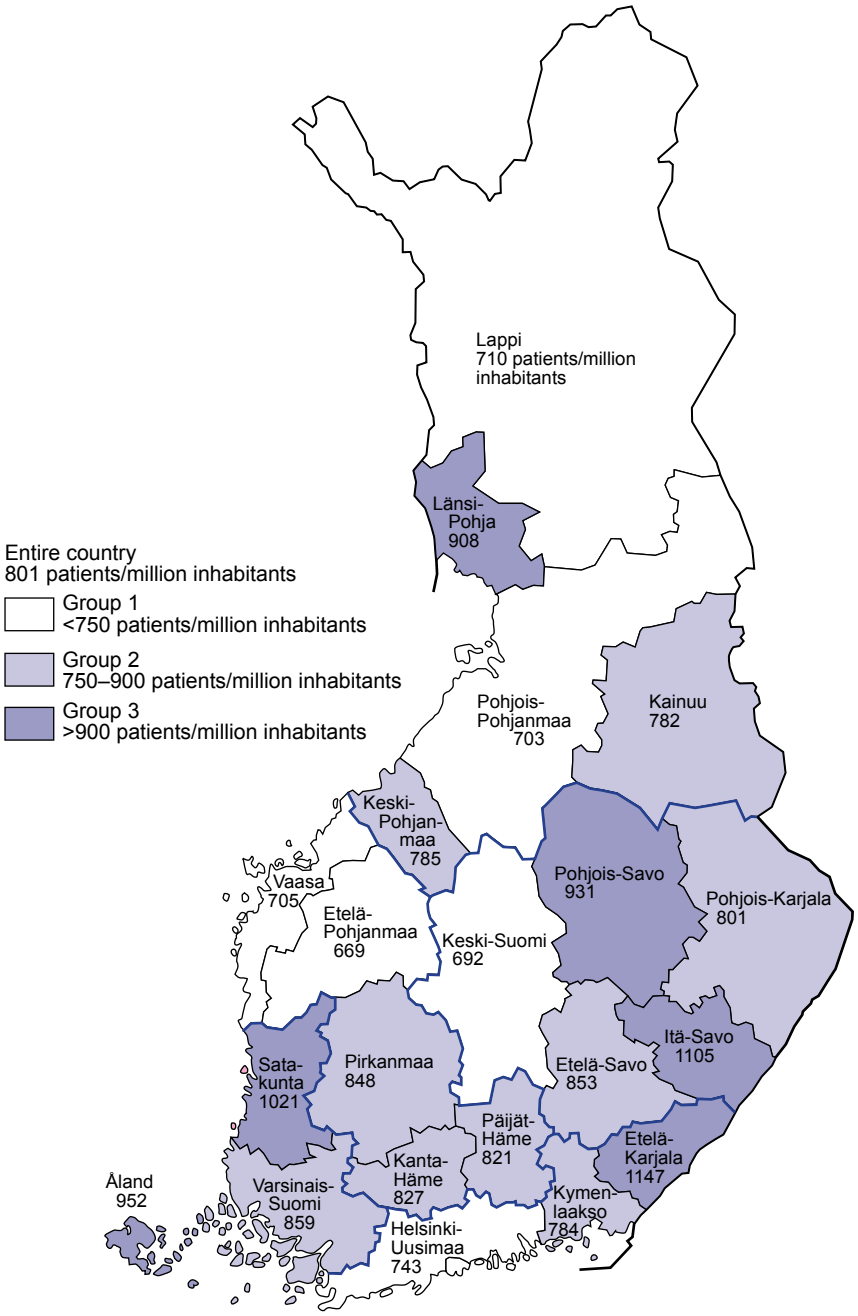


Table 7 shows the number of RRT patients and the prevalence of RRT on 31 December 2001–2011 according to age group and gender. The prevalence has increased by 31% since 2001. In the age group 75 years and older, the prevalence of RRT has increased by 85%. In 45–74-year-olds, the prevalence has increased by 24–32%, and in the age groups younger than 45 years, the prevalence has remained virtually unchanged. The highest prevalence, observed among men aged 65–74 years at the end of 2011, was 2586 cases per million inhabitants in this subgroup, which means that approximately every 387th man in this age group is on RRT. At the end of 2011, the prevalence was 76% greater among men than women, and the gender difference was even more pronounced in the older age groups.

Figure 6 shows the age- and gender-standardized prevalence rates for 2001–2011 using the Finnish general population on 31 December 2011 as the reference population. Population changes during this period have been taken into consideration. Standardization removes the effect of age and gender on regional differences in prevalence rates. After standardization, the prevalence differences between regions diminish slightly, but also in this analysis the prevalence is greatest in the southwestern region.

Figure 7. Prevalence of RRT in healthcare districts on 31 December 2011
Finnish Registry for Kidney Diseases 2011



The healthcare districts shown on the map are grouped according to the prevalence of RRT at the end of 2011 (Figure 7). The prevalence per million inhabitants was <750 in six districts, 750–900 in nine districts, and >900 in six districts. The borders of the regions are indicated with thick lines.

Figure 8. Prevalence of RRT at end of year according to type of treatment
Finnish Registry for Kidney Diseases 1965–2011

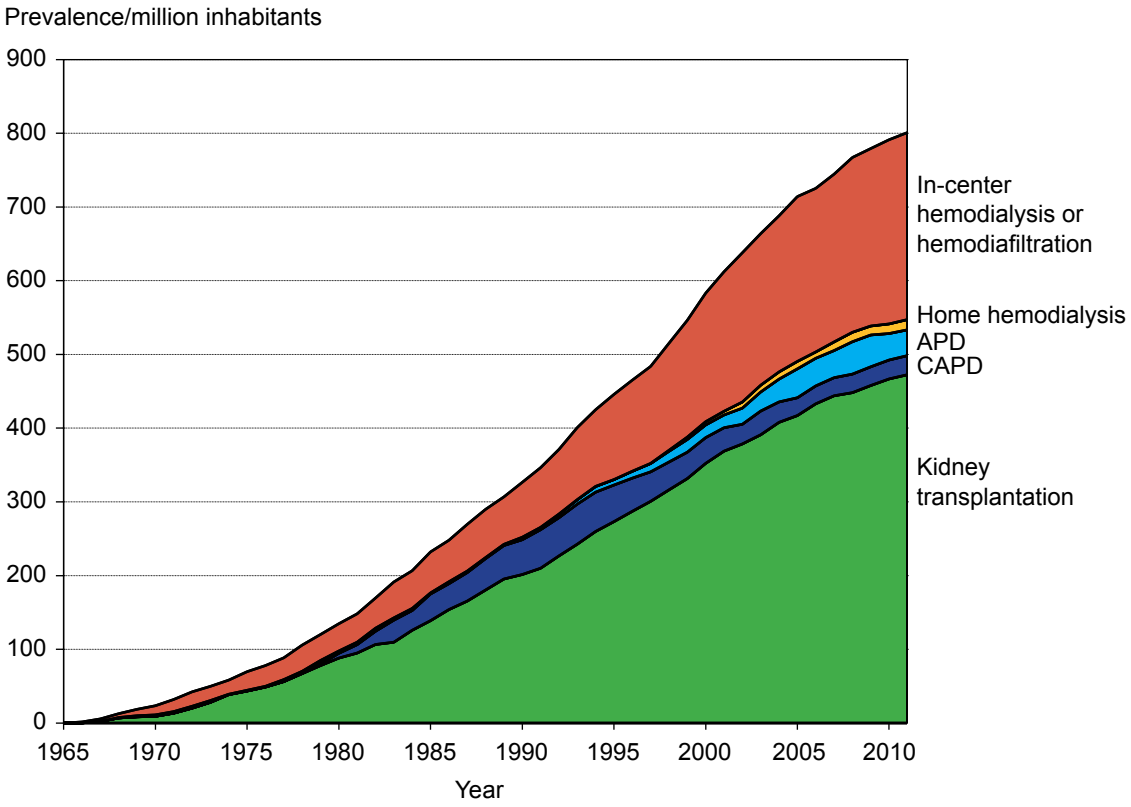


Figure 8 displays the prevalence of RRT according to treatment type. At the end of 2011, the prevalences of in-center HD, home HD, and kidney transplantation were higher than ever before. The prevalence of peritoneal dialysis has remained virtually unchanged for several years, but the proportion of automatic peritoneal dialysis (APD) has increased.

At the end of 2011, the proportion of in-center hemodialysis (in-center HD) patients of all RRT patients was 32%, that of home HD 2%, that of APD 4%, that of continuous peritoneal dialysis (CAPD) 3%, and that of kidney transplantation 59%.

Table 8. Number of patients on RRT according to type of treatment in healthcare districts
Finnish Registry for Kidney Diseases 2011

Healthcare district		Number of RRT patients on 31 December 2011 (%)						
		CAPD	APD	Home HD	In-center HD	HDF	Tx	Total
1	Helsinki-Uusimaa	40 (3)	47 (4)	38 (3)	240 (21)	71 (6)	712 (62)	1148 (100)
3	Varsinais-Suomi	11 (3)	22 (5)	10 (2)	75 (19)	37 (9)	249 (62)	404 (100)
4	Satakunta	13 (6)	12 (5)	2 (1)	42 (18)	12 (5)	149 (65)	230 (100)
5	Kanta-Häme	3 (2)	13 (9)	0 (0)	52 (36)	10 (7)	67 (46)	145 (100)
6	Pirkanmaa	13 (3)	10 (2)	4 (1)	124 (30)	28 (7)	236 (57)	415 (100)
7	Päijät-Häme	5 (3)	7 (4)	4 (2)	50 (29)	6 (3)	103 (59)	175 (100)
8	Kymenlaakso	4 (3)	13 (9)	2 (1)	41 (30)	8 (6)	69 (50)	137 (100)
9	Etelä-Karjala	4 (3)	1 (1)	2 (1)	47 (31)	19 (13)	79 (52)	152 (100)
10	Etelä-Savo	3 (3)	1 (1)	0 (0)	22 (24)	9 (10)	55 (61)	90 (100)
11	Itä-Savo	0 (0)	0 (0)	0 (0)	22 (44)	0 (0)	28 (56)	50 (100)
12	Pohjois-Karjala	3 (2)	4 (3)	0 (0)	48 (35)	0 (0)	81 (60)	136 (100)
13	Pohjois-Savo	4 (2)	8 (3)	4 (2)	69 (30)	10 (4)	136 (59)	231 (100)
14	Keski-Suomi	5 (3)	17 (9)	2 (1)	52 (27)	6 (3)	108 (57)	190 (100)
15	Etelä-Pohjanmaa	4 (3)	4 (3)	0 (0)	25 (19)	25 (19)	75 (56)	133 (100)
16	Vaasa	3 (3)	7 (6)	0 (0)	35 (30)	2 (2)	71 (60)	118 (100)
17	Keski-Pohjanmaa	4 (7)	1 (2)	0 (0)	22 (37)	0 (0)	32 (54)	59 (100)
18	Pohjois-Pohjanmaa	5 (2)	13 (5)	4 (1)	81 (29)	4 (1)	175 (62)	282 (100)
19	Kainuu	1 (2)	4 (7)	0 (0)	11 (18)	5 (8)	40 (66)	61 (100)
20	Länsi-Pohja	3 (5)	3 (5)	0 (0)	19 (32)	7 (12)	27 (46)	59 (100)
21	Lappi	12 (14)	2 (2)	2 (2)	20 (24)	0 (0)	48 (57)	84 (100)
22	Åland	0 (0)	0 (0)	1 (4)	10 (37)	4 (15)	12 (44)	27 (100)
Region	South	51 (4)	58 (4)	42 (3)	328 (23)	98 (7)	860 (60)	1437 (100)
	Southwest	24 (4)	34 (5)	13 (2)	127 (19)	53 (8)	410 (62)	661 (100)
	West	28 (3)	41 (4)	8 (1)	286 (29)	71 (7)	552 (56)	986 (100)
	East	15 (2)	30 (4)	6 (1)	213 (31)	25 (4)	408 (59)	697 (100)
	North	26 (5)	22 (4)	6 (1)	153 (28)	16 (3)	322 (59)	545 (100)
Entire country		140 (3)	189 (4)	75 (2)	1107 (26)	263 (6)	2552 (59)	4326 (100)

Table 8 presents the number of RRT patients according to type of treatment in healthcare districts and regions. The proportion of peritoneal dialysis was the greatest in Lapland, where 14% of the RRT patients were on continuous peritoneal dialysis (CAPD) and 2% on automatic peritoneal dialysis (APD) at the end of 2011. The proportion of home hemodialysis (home HD) was the highest, 3%, in the healthcare district of Helsinki-Uusimaa. The proportion of kidney transplantation patients did not vary considerably between healthcare districts.

Of all RRT patients, 23% were on home dialysis (CAPD, APD, or home HD) at the end of 2011. The proportion of home dialysis was higher than 30% in two healthcare districts (Lappi and Satakunta) and lower than 15% in six healthcare districts.

Figure 9. International comparison of prevalence of RRT on 31 December 2010
Finnish Registry for Kidney Diseases 2010

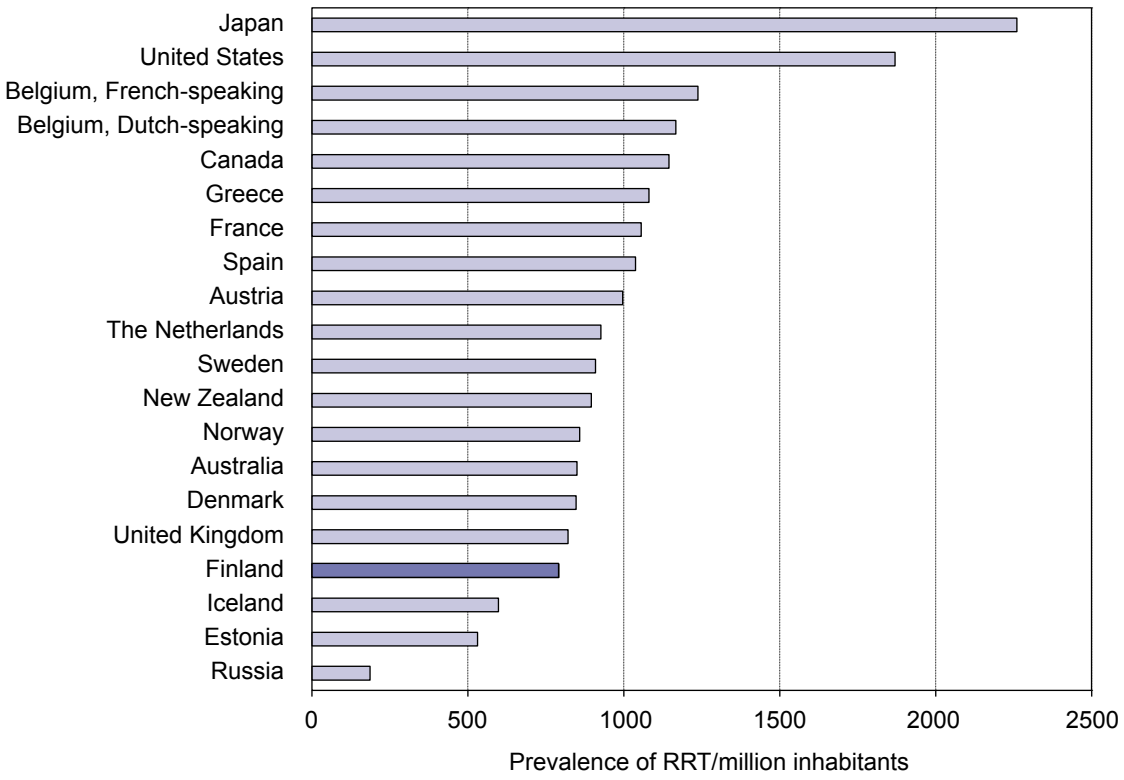


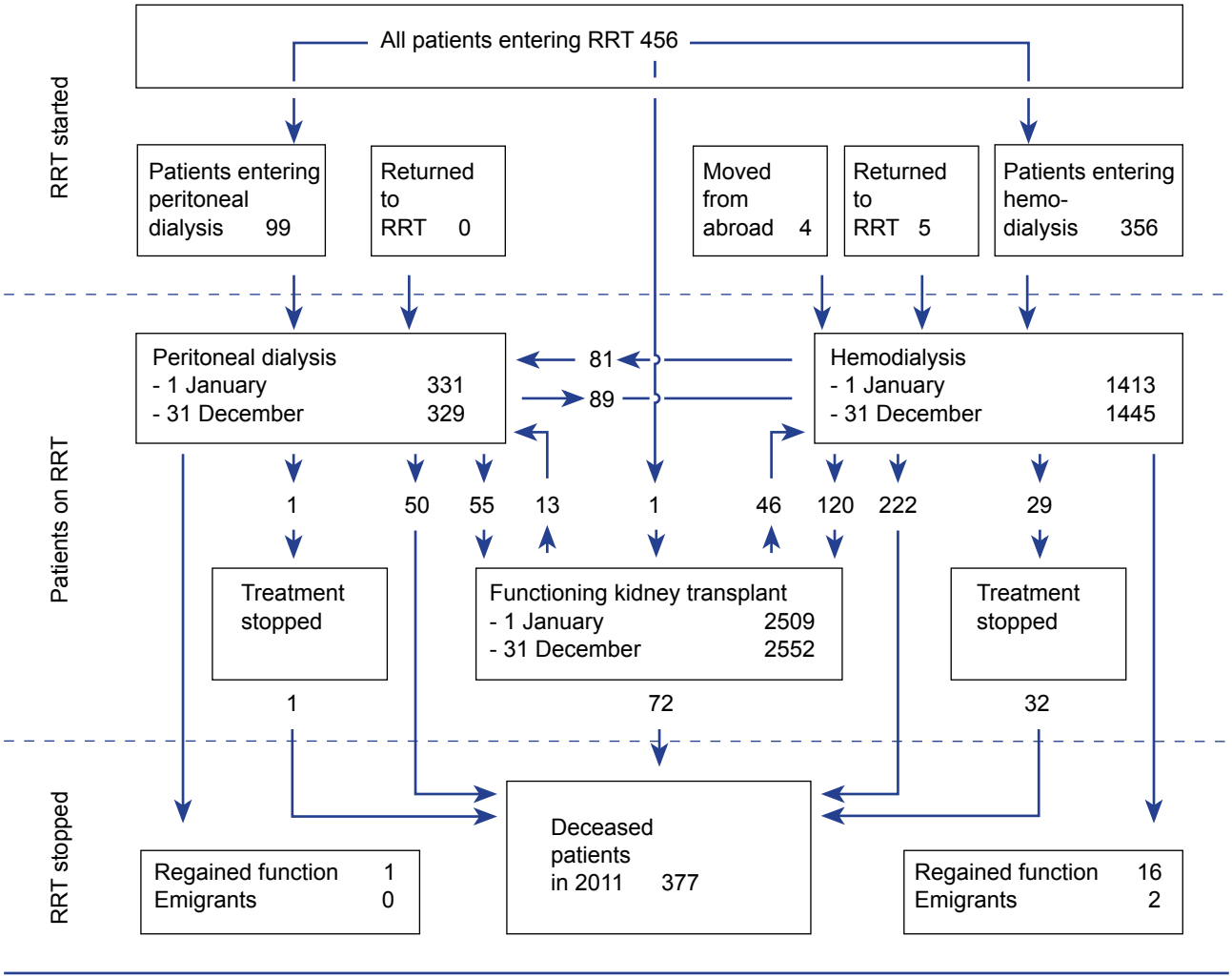
Figure 9 displays the prevalence of RRT on 31 December 2010 in countries reporting to the ERA-EDTA Registry (Annual Report 2010, http://www.era-edta-reg.org) and in the United States, Canada, Australia, New Zealand, and Japan (The 2012 USRDS Annual Data Report Atlas, http://www.usrds.org). The prevalence rate in Finland was the fourth lowest internationally and the second lowest in the Nordic countries. Relative to Finland, the prevalence in Sweden was 15% higher, in Norway 8% higher, and in Denmark 7% higher. Figure 5 shows the international incidence rates.

Table 9. Number of patient-years of all RRT patients according to diagnosis and type of treatment Finnish Registry for Kidney Diseases 2001–2011

Diagnosis	Number of patient-years in 2001 (%)				Number of patient-years in 2011 (%)			
	Peritoneal dialysis	Hemo-dialysis	Trans-plantation	Total	Peritoneal dialysis	Hemo-dialysis	Trans-plantation	Total
Glomerulonephritis	53 (19.8)	155 (16.0)	567 (30.2)	775 (24.9)	67 (20.3)	212 (15.0)	665 (26.2)	944 (22.0)
Type 1 diabetes	59 (22.3)	98 (10.1)	372 (19.8)	529 (17.0)	80 (24.3)	148 (10.5)	477 (18.8)	705 (16.5)
Polycystic degeneration	19 (7.1)	105 (10.8)	266 (14.2)	389 (12.5)	24 (7.3)	124 (8.8)	427 (16.8)	575 (13.4)
Undefined kidney disease	22 (8.3)	97 (10.0)	50 (2.7)	169 (5.4)	44 (13.2)	234 (16.5)	127 (5.0)	404 (9.4)
Type 2 diabetes	29 (11.0)	177 (18.3)	22 (1.2)	228 (7.3)	42 (12.8)	285 (20.1)	77 (3.0)	404 (9.4)
Pyelonephritis	14 (5.3)	52 (5.4)	203 (10.8)	269 (8.7)	6 (1.9)	50 (3.5)	198 (7.8)	254 (5.9)
Nephrosclerosis	19 (7.1)	67 (7.0)	43 (2.3)	129 (4.2)	20 (6.0)	97 (6.9)	70 (2.8)	187 (4.4)
Other systemic diseases	10 (3.8)	35 (3.6)	55 (2.9)	100 (3.2)	13 (3.8)	65 (4.6)	94 (3.7)	171 (4.0)
Urinary tract obstruction	7 (2.5)	26 (2.7)	74 (3.9)	106 (3.4)	6 (1.8)	51 (3.6)	95 (3.7)	152 (3.5)
Congenital diseases	6 (2.1)	10 (1.0)	80 (4.3)	95 (3.1)	7 (2.0)	19 (1.3)	101 (4.0)	126 (2.9)
Amyloidosis	10 (3.9)	82 (8.5)	43 (2.3)	135 (4.3)	7 (2.1)	42 (3.0)	38 (1.5)	87 (2.0)
Congenital nephrosis, Finnish type	5 (1.8)	1 (0.1)	46 (2.4)	51 (1.7)	5 (1.4)	7 (0.5)	69 (2.7)	81 (1.9)
Other kidney diseases	8 (2.9)	27 (2.8)	13 (0.7)	48 (1.5)	6 (1.8)	29 (2.0)	41 (1.6)	76 (1.8)
Tubulointerstitial nephritis	2 (0.9)	14 (1.5)	34 (1.8)	50 (1.6)	1 (0.3)	13 (0.9)	38 (1.5)	52 (1.2)
Malignancies	2 (0.8)	19 (1.9)	2 (0.1)	23 (0.7)	2 (0.5)	33 (2.4)	8 (0.3)	43 (1.0)
Metabolic diseases	1 (0.3)	4 (0.4)	7 (0.4)	12 (0.4)	2 (0.5)	5 (0.4)	15 (0.6)	22 (0.5)
All	266 (100)	967 (100)	1875 (100)	3108 (100)	330 (100)	1414 (100)	2539 (100)	4283 (100)

Table 9 presents the number of patient-years according to diagnosis of kidney disease and type of treatment in 2001 and 2011. The number of patient-years indicates time spent by patients in RRT during the year. Overall, the number of patient-years has increased by 38% since 2000. The number of patient-years has increased the most (46%) in hemodialysis. Glomerulonephritis is the most common diagnosis among all RRT patients and kidney transplantation patients; the proportion of patient-years due to glomerulonephritis was 22% in 2011. Type 1 diabetes is the second most common diagnosis among all RRT patients and the most common diagnosis among peritoneal dialysis patients. The number of patient-years due to type 2 diabetes has increased by 77% during the past decade, and in 2011, type 2 diabetes was the most common kidney disease diagnosis among hemodialysis patients. Among kidney transplantation patients, type 2 diabetes is a rare cause of end-stage renal disease. The proportions of patient-years due to amyloidosis and pyelonephritis have decreased since 2001.

Figure 10. Net changes in type of treatment
Finnish Registry for Kidney Diseases 2011



During 2011, 456 new patients entered RRT (Figure 10), and five patients returned to RRT. In all, 4253 patients were receiving RRT at the beginning of the year. Altogether 377 patients died and dialysis was discontinued for 17 patients because patients' own kidney function resumed. Of those who died, 72 had a functioning transplant, 50 were receiving peritoneal dialysis, and 222 were on hemodialysis. RRT was discontinued for 30 uremic patients, and the treatment of four patients who died in 2011 had been discontinued in 2010. One patient whose treatment was discontinued in 2011 died at the beginning of 2012. A total of 177 patients received a kidney transplant. One of these patients received a combined liver and kidney transplantation and one received a combined pancreas and kidney transplantation (source: Kidney Transplantation Unit, Helsinki University Central Hospital). Thirteen kidney transplants were received from living donors.

Table 10. Mortality of RRT patients by region
Finnish Registry for Kidney Diseases 2001–2011

Region	Deaths/1000 patient-years						Deaths/1000 patient-years[1)]					
	2001	2006	2009	2010	2011	2007–2011	2001	2006	2009	2010	2011	2007–2011
South	82	72	79	69	71	77	79	67	77	68	69	76
Southwest	86	88	73	74	85	78	78	87	73	72	84	77
West	130	134	99	96	109	99	117	128	93	91	105	94
East	107	105	81	97	92	94	89	103	80	94	92	93
North	95	89	86	88	94	99	90	89	86	88	92	98
Entire country	99	96	84	83	88	88	90	92	82	81	86	86

[1)]Patients who died within 90 days of start of RRT excluded

Figure 11. Standardized mortality of RRT patients by region
Finnish Registry for Kidney Diseases 2001–2011

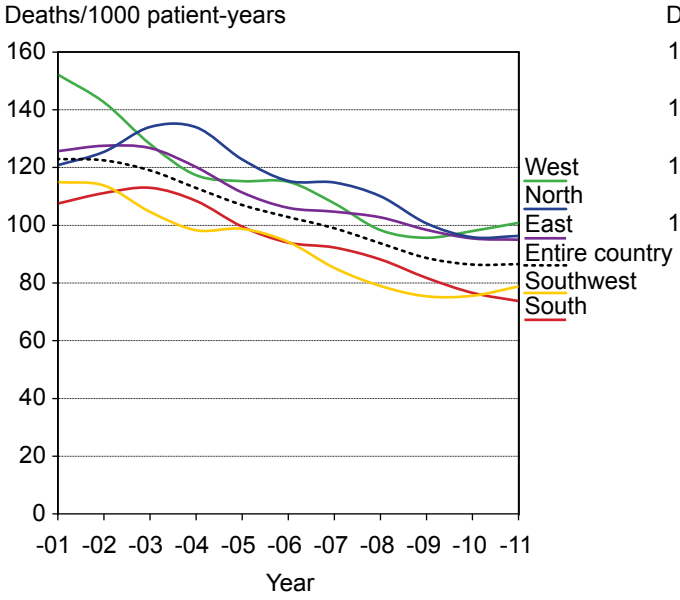


Figure 12. Standardized mortality of RRT patients by region (patients who died within 90 days of start of RRT excluded)
Finnish Registry for Kidney Diseases 2001–2011

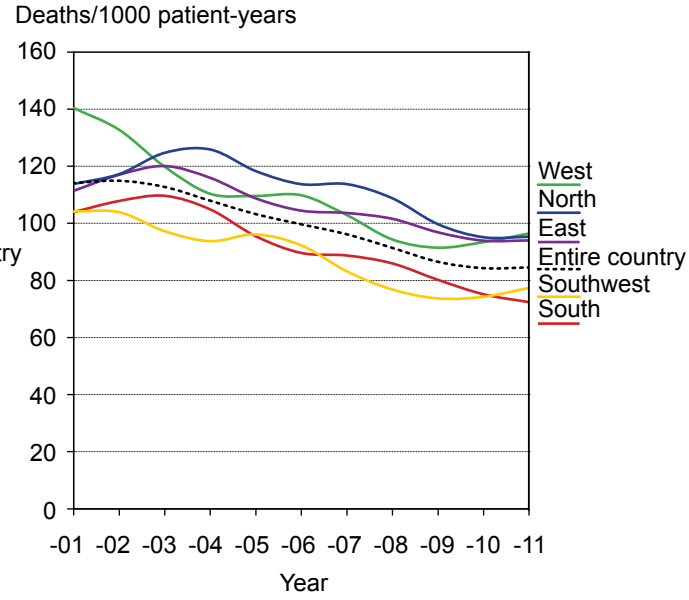


Table 10 shows RRT patients' mortality in 2001–2011 according to region. The mortality of patients who had been on RRT for at least 90 days is presented separately. The average mortality in 2007–2011 was lower in the southern and southwestern regions than elsewhere.

Figures 11 and 12 show regional mortality as smoothed averages. The regional mortality rates for 2001–2011 have been age- and gender-standardized using all patient-years in 2011 as the reference. Changes in age and gender distribution during this ten-year period have been taken into consideration. Patients who died within 90 days of the start of RRT were excluded from Figure 12. The standardized mortality rate has decreased in all regions over the past ten years, but in 2011 mortality was slightly higher than in 2010. Standardized mortality was lower in the southern and southwestern regions than elsewhere.

Table 11. Incidence of RRT among 0–19-year-olds
Finnish Registry for Kidney Diseases 1990–2011

Age group		Number of new RRT patients		Incidence/million inhabitants*	
		1990–1999	2000–2011	1990–1999	2000–2011
0 y	Males	24	24	76	67
	Females	18	21	59	62
	Total	42	45	67	64
1–4 y	Males	12	5	9	4
	Females	3	7	2	5
	Total	15	12	6	4
5–9 y	Males	12	6	7	3
	Females	3	7	2	4
	Total	15	13	5	4
10–14 y	Males	19	15	11	8
	Females	7	10	4	5
	Total	26	25	8	7
15–19 y	Males	15	26	9	13
	Females	11	18	7	9
	Total	26	44	8	11
0–19 y	Males	82	76	12	10
	Females	42	63	7	9
	Total	124	139	10	9

*Average annual incidence/million inhabitants in subgroup

From here onwards, we present special analyses of RRT in patients younger than 20 years. The following aspects are covered: incidence of RRT (pages 23–25), prevalence of RRT (pages 26 and 27), patient survival (page 28), probability of receiving a kidney graft (page 29), and graft survival (pages 30 and 31).

In 1990–2011, 263 patients younger than 20 years entered RRT (Table 11). In children younger than one year, the incidence of RRT was severalfold that seen in the other age groups, in which the annual incidence was 4–11 new RRT patients per million inhabitants. Among boys younger than 15 years, the mean annual incidence in 2000–2011 was 9 and among girls 8 new RRT patients per million inhabitants.

Figure 13. Number of new RRT patients younger than 20 years
Finnish Registry for Kidney Diseases 1990–2011

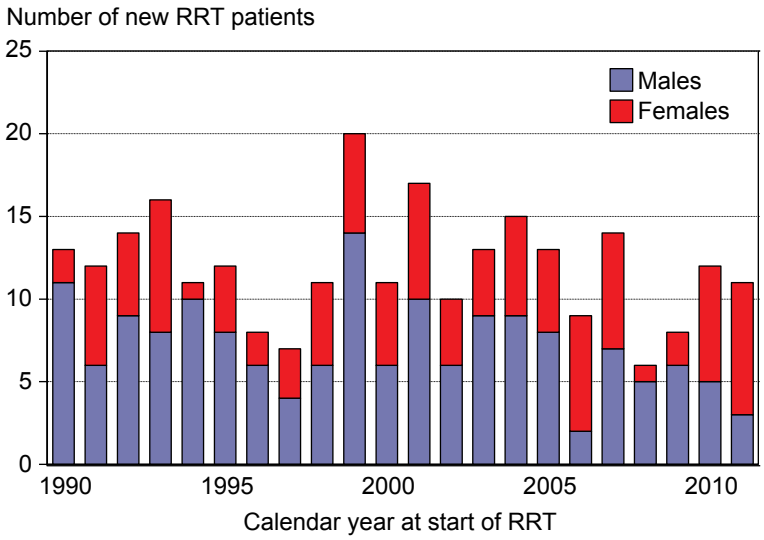
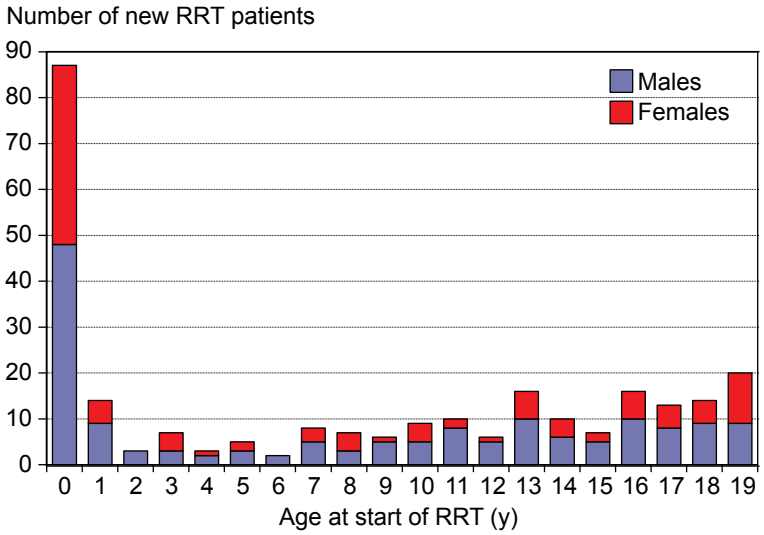


Figure 14. Number of new RRT patients younger than 20 years according to age
Finnish Registry for Kidney Diseases 1990–2011



In 1990–2011, 263 patients younger than 20 years entered RRT. Of these, 105 (40%) were girls. Each year, an average of 12 (range 6–20) new patients entered RRT (Figure 13).

Of patients younger than 20 years who entered RRT in 1990–2011, 87 (33%) were under one year of age (Figure 14). In these patients, the most common diagnosis was congenital nephrotic syndrome of the Finnish type; this was the cause of end-stage renal disease in 74% of patients in this age group.

Table 12. Number of new RRT patients younger than 20 years according to diagnosis
Finnish Registry for Kidney Diseases 1990–2011

Diagnosis	Age at start of RRT											
	0–4 y		5–9 y		10–14 y		15–19 y		0–19 y			
	M	F	M	F	M	F	M	F	M	F	Total (%)	
Congenital nephrosis, Finnish type	41	32							41	32	73	(28)
CAKUT	13	2	7	2	14	1	17	5	51	10	63	(24)
Cystic kidney diseases	4	8	7		9	6		6	20	20	40	(15)
Glomerulonephritis		1		1	5	4	11	7	16	13	29	(11)
Vasculitis					3	1	3	1	6	2	8	(3)
Alport's syndrome			1		1		3		5		5	(2)
Hemolytic uremic syndrome	2	1		1					2	2	4	(2)
Metabolic disorders	1	1				1	1		2	2	4	(2)
Pyelonephritis				1		1				2	2	(1)
Other defined kidney diseases	2	1	2	3	1	3	3	7	8	14	20	(8)
Undefined kidney disease	2	3	1	2	1		3	3	7	8	15	(6)
All	65	49	18	10	34	17	41	29	158	105	263	(100)

M=Males, F=Females
CAKUT=Congenital anomalies of the kidney and urinary tract

Table 13. Number of new RRT patients younger than 20 years according to first type of treatment
Finnish Registry for Kidney Diseases 1990–2011

Type of treatment	Age at start of RRT											
	0–4 y		5–9 y		10–14 y		15–19 y		0–19 y			
	1990–1999	2000–2011	1990–1999	2000–2011	1990–1999	2000–2011	1990–1999	2000–2011	1990–1999	2000–2011	Total (%)	
CAPD	6	8			1	1	6	4	13	13	26	(10)
APD	50	46	15	9	23	11	8	7	96	73	169	(64)
Hemodialysis		2		4	2	12	12	32	14	50	64	(24)
Transplantation	1	1				1		1	1	3	4	(2)
All	57	57	15	13	26	25	26	44	124	139	263	(100)

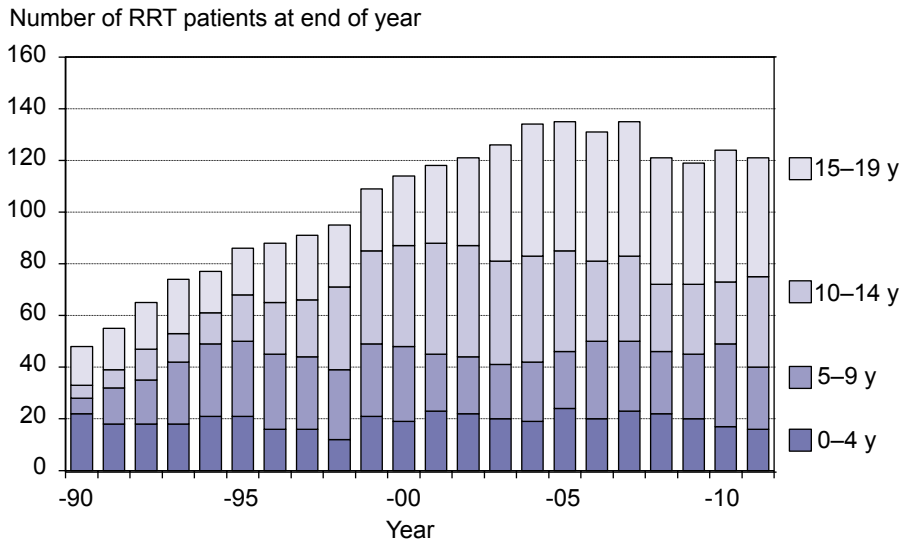
Table 12 presents the number of patients younger than 20 years who entered RRT in 1990–2011 according to diagnosis, age group, and gender. Congenital nephrotic syndrome of the Finnish type was the most common diagnosis, and it typically caused initiation of RRT at the age of 6–12 months. Congenital anomalies of the kidney and urinary tract constituted the second most common group of diagnoses. Cystic kidney diseases caused end-stage kidney disease in 40 patients (15%), and of these, 19 had nephronophthisis or medullary cystic kidney disease and 14 had polycystic kidney disease. Glomerulonephritis had led to initiation of RRT in 11% of the patients.

Automatic peritoneal dialysis (APD) was the first type of treatment in 64% of the patients who entered RRT in 1990–2011 (Table 13). Continuous ambulatory peritoneal dialysis (CAPD) was the first type of treatment in 10% and hemodialysis in 24% of the patients. The proportion of patients entering hemodialysis increased; in the 1990s, 11% and in 2000–2011 24% of the new RRT patients entered hemodialysis. Four patients received a kidney transplant without a preceding period of dialysis.

Table 14. Prevalence of RRT among 0–19-year-olds
Finnish Registry for Kidney Diseases 1990–2011

Age group		Number of RRT patients at end of year				Prevalence of RRT/million inhabitants			
		1990	2000	2010	2011	1990	2000	2010	2011
0–4 y	Males	17	13	10	9	106	87	65	58
	Females	5	6	7	7	33	42	47	47
	Total	22	19	17	16	70	65	56	53
5–9 y	Males	4	15	16	12	24	90	108	80
	Females	2	14	16	12	13	87	113	84
	Total	6	29	32	24	18	89	111	82
10–14 y	Males	3	27	14	19	18	166	92	127
	Females	2	12	10	16	13	77	69	112
	Total	5	39	24	35	15	122	81	119
15–19 y	Males	11	21	30	26	71	124	177	155
	Females	4	6	21	20	27	37	129	125
	Total	15	27	51	46	49	81	154	140
0–19 y	Males	35	76	70	66	54	117	112	106
	Females	13	38	54	55	21	61	90	92
	Total	48	114	124	121	38	90	102	99

Figure 15. Number of RRT patients younger than 20 years at end of year
Finnish Registry for Kidney Diseases 1990–2011



At the end of 2011, 121 patients under the age of 20 years were on RRT and the prevalence of RRT was 99 per million inhabitants in this age group (Table 14). The prevalence was lowest among 0–4-year-olds and highest among 15–19-year-olds. This is not because of a higher incidence of RRT in the oldest age group, but is caused by the cumulative number of patients entering RRT.

Figure 15 shows the number of RRT patients younger than 20 years according to age group at the end of each year. The number of 0–4-year-old patients did not increase in 1990–2011, the number of 5–9-olds increased until 1995, the number of 10–14-year-olds increased in 1995–2000, and the number of 15–19-year-olds increased in 2000–2005. From 2005 onwards, the number of RRT patients younger than 20 years has remained stable.

Table 15. Number of RRT patients younger than 20 years according to diagnosis
Finnish Registry for Kidney Diseases 2011

Diagnosis	Age at end of 2011											
	0–4 y		5–9 y		10–14 y		15–19 y		0–19 y			
	M	F	M	F	M	F	M	F	M	F	Total	(%)
Congenital nephrosis, Finnish type	7	5	7	8	8	5	7	7	29	25	54	(45)
CAKUT	1		3		6	2	9	3	19	5	24	(20)
Cystic kidney diseases				3	1	4	4	3	5	10	15	(12)
Glomerulonephritis		1				1		4		6	6	(5)
Hemolytic uremic syndrome	1		1			1			2	1	3	(2)
Metabolic disorders					1	1			1	1	2	(2)
Vasculitis					1		1		2		2	(2)
Alport's syndrome							1		1		1	(1)
Other defined kidney diseases				1	2	1	2	1	4	3	7	(6)
Undefined kidney disease		1	1			1	2	2	3	4	7	(6)
All	9	7	12	12	19	16	26	20	66	55	121	(100)

CAKUT=Congenital anomalies of the kidney and urinary tract

Table 16. Number of RRT patients younger than 20 years according to type of treatment
Finnish Registry for Kidney Diseases 2000–2011

Type of treatment	Age at end of 2011									
	0–4 y		5–9 y		10–14 y		15–19 y		0–19 y	
	2000	2011	2000	2011	2000	2011	2000	2011	2000 (%)	2011 (%)
CAPD	1	1					1		2 (2)	1 (1)
APD	3	5	1		5		2	1	11 (10)	6 (5)
Hemodialysis	1				2	2	3	6	6 (5)	8 (7)
Transplantation	14	10	28	24	32	33	21	39	95 (83)	106 (88)
All	19	16	29	24	39	35	27	46	114 (100)	121 (100)

Congenital nephrotic syndrome of the Finnish type was the cause of end-stage renal disease in 45% of all RRT patients younger than 20 years at the end of 2011 (Table 15), and this proportion was larger than the corresponding proportion for patients entering RRT (28%, Table 12). This is due to the fact that congenital nephrotic syndrome of the Finnish type is usually diagnosed when the patient is aged under one year, and the patients remain in RRT for a long period before reaching the age of 20 years. The second most common cause of end-stage renal disease was congenital anomalies of the kidney and urinary tract, and the third most common cause was cystic kidney diseases.

The number of RRT patients younger than 20 years at the end of 2000 and 2011 is shown according to type of treatment and age group in Table 16. At the end of 2011, 88% of the patients had a functioning kidney graft, 7% were on hemodialysis, and 6% were on peritoneal dialysis.

Figure 16. Survival of patients younger than 20 years entering RRT according to age group
Finnish Registry for Kidney Diseases 1990–2011

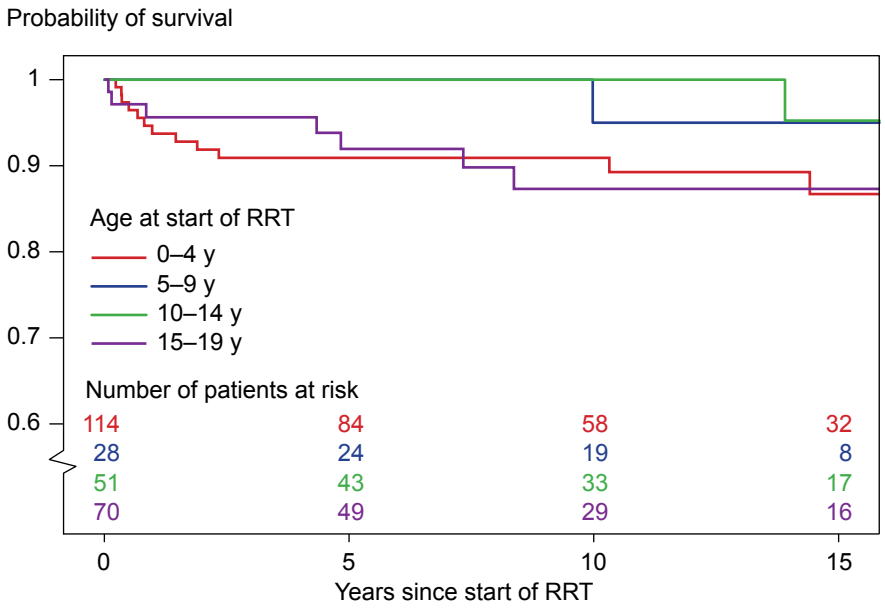
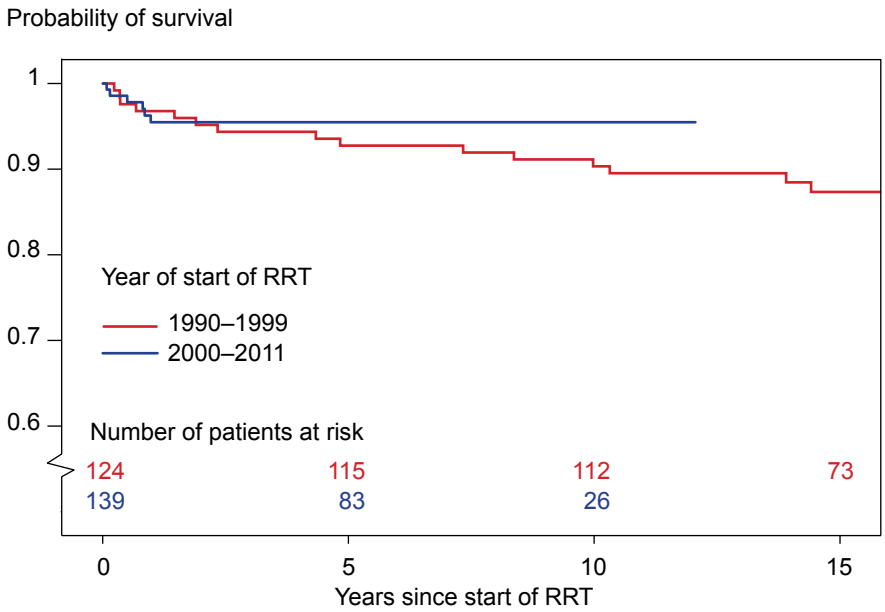


Figure 17. Survival of patients younger than 20 years entering RRT according to year of start of RRT
Finnish Registry for Kidney Diseases 1990–2011



During 1990–2011, 263 patients younger than 20 years entered RRT; 22 of these patients died before the end of 2011. The probability of survival was 94% at 5 years and 92% at 10 years from start of RRT. Figure 16 shows the probability of survival by age group. The survival probability of 0–4-year-olds and 15–19-year-olds appears slightly lower than that of 5–14-year-olds, but the difference was not significant (p=0.127). Neither gender nor kidney disease diagnosis was significantly associated with survival.

No significant difference in survival was present between patients entering RRT in 2000–2011 and 1990–1999 (Figure 17). However, it is noteworthy that among patients entering RRT in 2000–2011 no deaths occurred after the first year of RRT.

Figure 18. 0–19-year-old RRT patients' probability of receiving a kidney transplant according to age group
Finnish Registry for Kidney Diseases 1990–2011

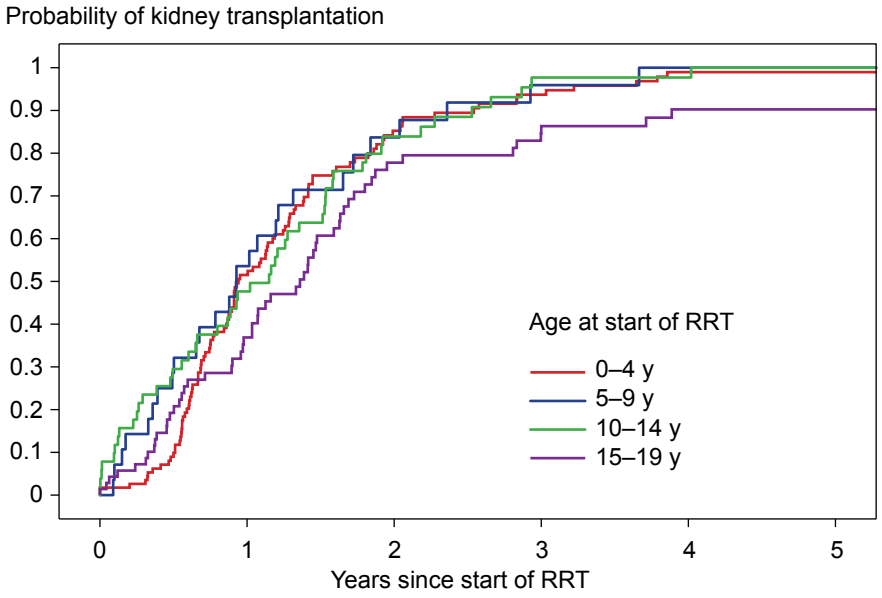
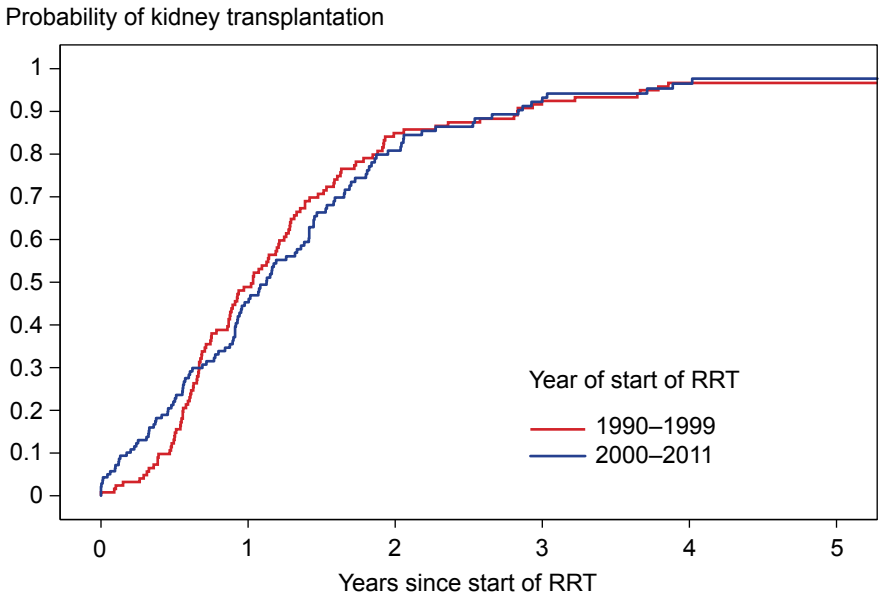


Figure 19. 0–19-year-old RRT patients' probability of receiving a kidney transplant according to year of start of RRT
Finnish Registry for Kidney Diseases 1990–2011



Of the 263 patients who entered RRT in 1990–2011, 237 (90%) had received a kidney graft from a living (n=55, 23%) or deceased (n=182) donor before the end of 2011. Patients who received a graft from a living donor spent a shorter time in dialysis before the transplantation (median 0.6 vs. 1.2 years, p<0.001).

Figure 18 shows the probability of receiving the first kidney graft (from either a living or deceased donor) according to age group. The probability of receiving a kidney graft differed between age groups (p=0.048). Patients aged 15–19 years waited a longer time for the graft than younger patients, and they more seldom received a graft from a living donor (12% of grafts from living donor) than patients who were younger than 15 years (27%).

In the age group of 0–4-year-olds, the majority were younger than one year when entering RRT, and this is apparently the reason for the somewhat lower probability of kidney transplantation during the first months of RRT in this age group.

No difference was observed in probability of receiving the first kidney graft between patients entering RRT in 1990–1999 and those entering in 2000–2011 (Figure 19). Neither gender nor kidney disease diagnosis was associated with probability of receiving a kidney graft.

Figure 20. Kidney graft survival among 0–19-year-old kidney transplantation patients according to age group
Finnish Registry for Kidney Diseases 1990–2011

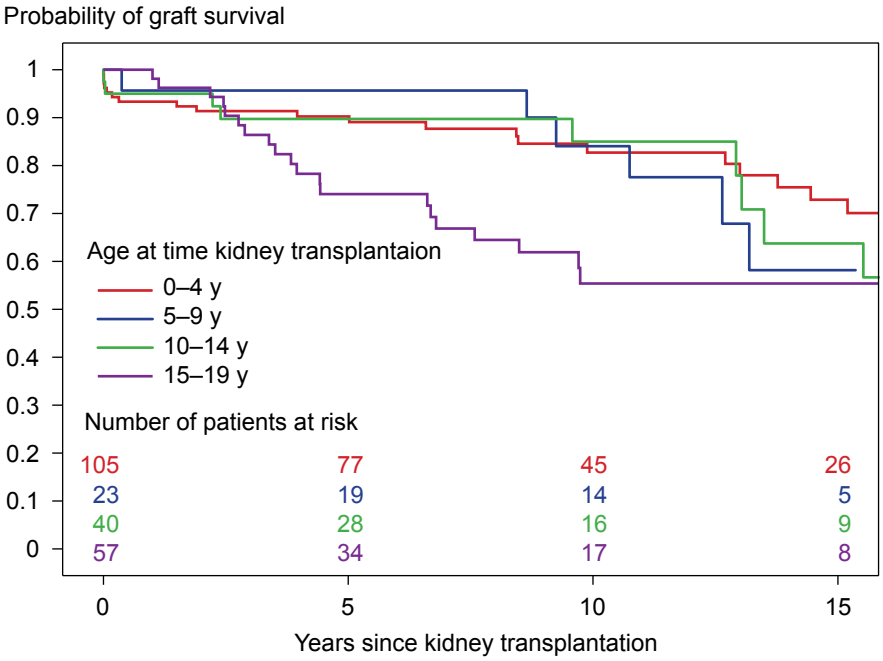
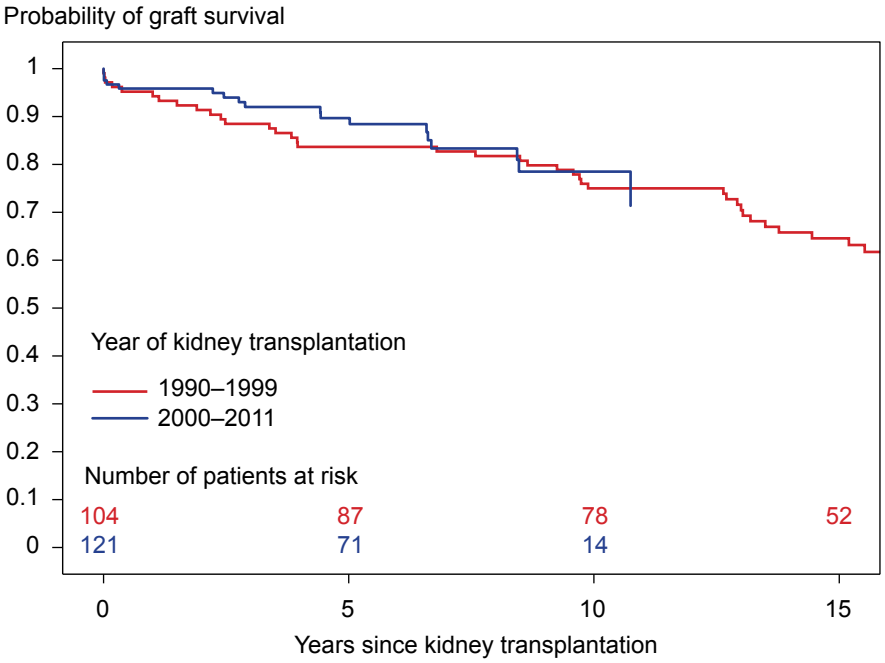


Figure 21. Kidney graft survival among 0–19-year-old kidney transplantation patients according to year of start of RRT
Finnish Registry for Kidney Diseases 1990–2011



During 1990–2011, 225 patients younger than 20 years received their first kidney transplant. Before the end of 2011, 63 (28%) of these patients had lost their graft (56 had entered dialysis and 7 had died). The probability of graft survival is shown by age group in Figure 20. Graft survival was lower among 15–19-year old (55% at 10 years after transplantation) than 0–14-year old (83%, p=0.013) kidney transplantation patients.

No difference in graft survival was observed between those receiving their graft in the 1990s and those receiving it in 2000–2011 (Figure 21, p=0.802). Patients' gender was not associated with graft survival.

Figure 22. Kidney graft survival among 0–19-year-old kidney transplantation patients according to donor status
Finnish Registry for Kidney Diseases 1990–1999

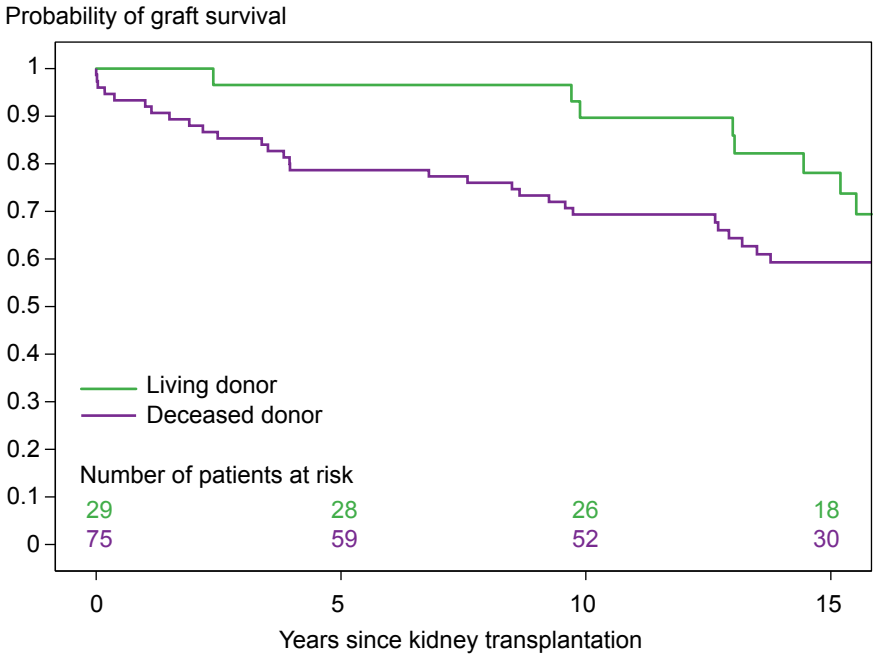


Figure 23. Kidney graft survival among 0–19-year-old kidney transplantation patients according to donor status
Finnish Registry for Kidney Diseases 2000–2011

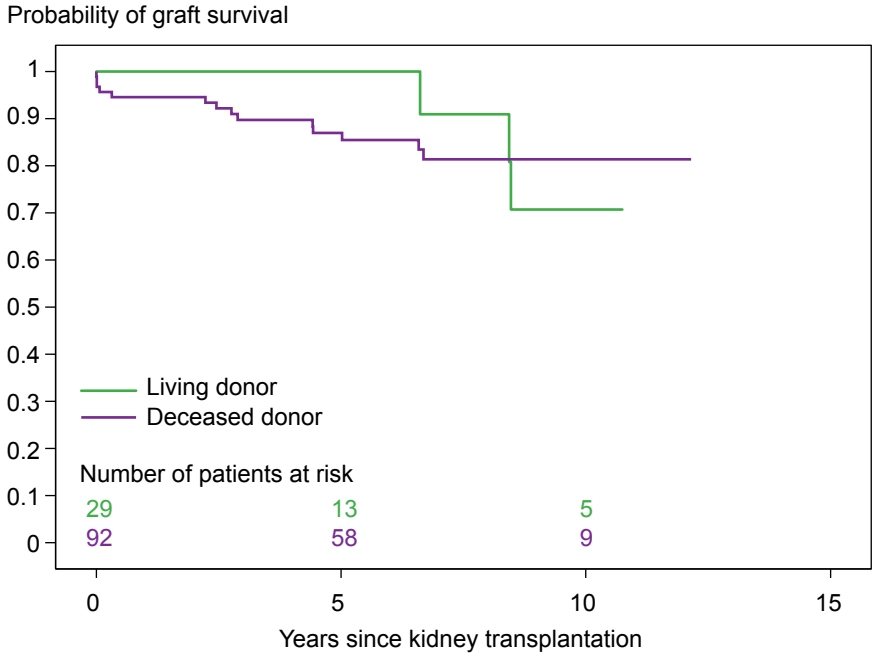


Figure 22 presents the probability of graft survival among patients younger than 20 years who received their kidney graft in 1990–1999 according to donor type. Of the grafts, 29 were received from a living donor and 75 from a deceased donor. Survival of the grafts from living donors was better during the first years, but after 15 years the survival curves approached each other and no significant difference was observed (p=0.299).

Figure 23 is similar to Figure 22, but presents patients who received their first kidney transplant in 2000–2011. No statistically significant difference existed in survival between grafts received from living (n=29) and deceased (n=92) donors. Five years after the transplantation, survival of grafts from living donors was 100% and from deceased donors 87%. In countries reporting to the ERA-EDTA Registry, the corresponding probabilities of graft survival were 83% and 78% among patients receiving their first kidney graft in 2001–2005 (Annual Report 2010, http://www.era-edta-reg.org).

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Finnish Registry for Kidney Diseases

Report 2011

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