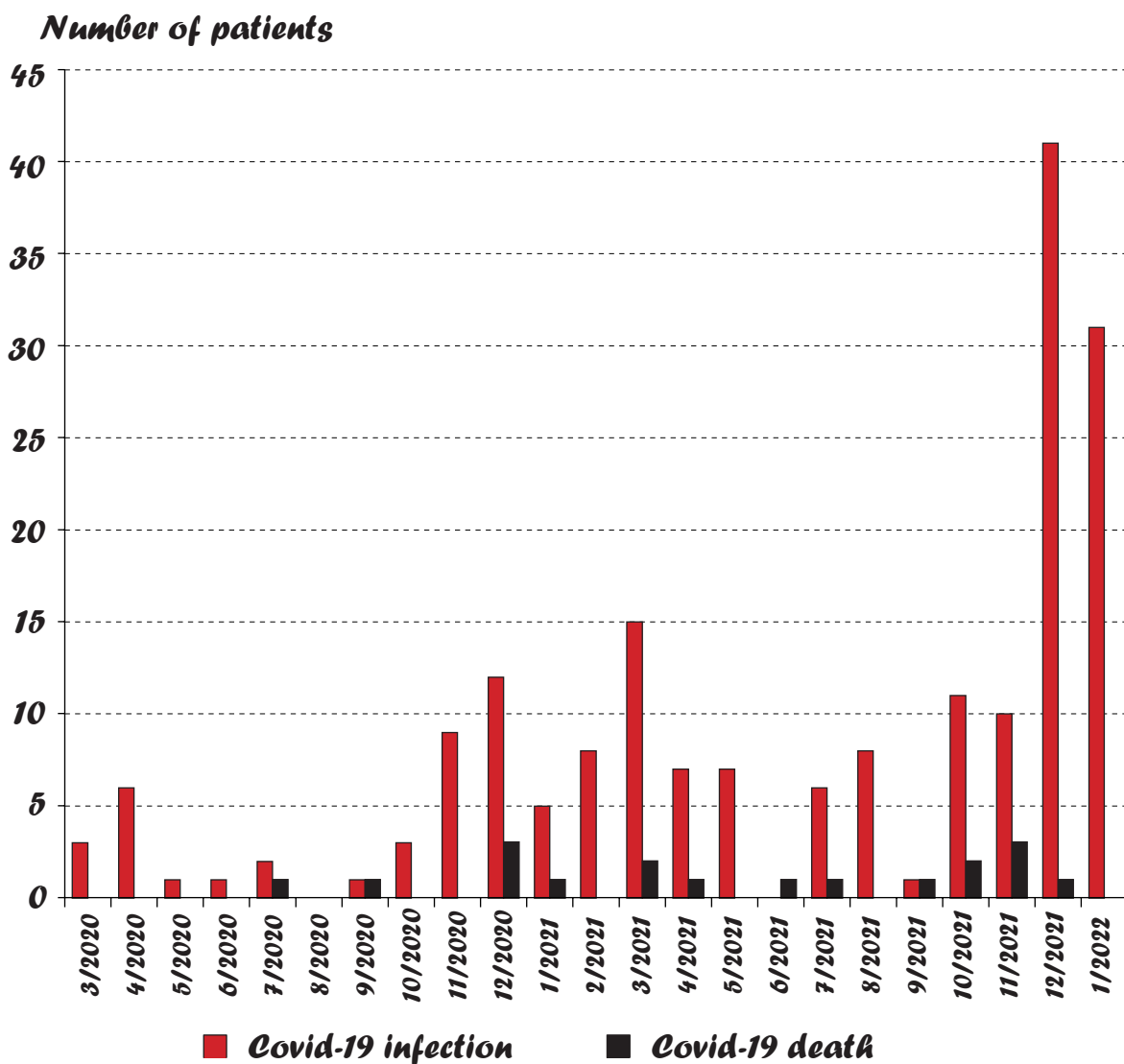


Report 2020

Finnish Registry for Kidney Diseases



Finnish Registry for Kidney Diseases – Report 2020

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Finnish Registry for Kidney Diseases 2020

The Finnish Registry for Kidney Diseases has for over three decades annually published a report on patients initiating and currently on kidney replacement therapy (KRT). The register contains information on virtually every KRT patient in Finland since 1965. For almost ten years, the report has also included a section on quality of care, presenting the main quality of care indicators and the changing quality analyses. Thus, the Finnish Registry for Kidney Diseases is one of the most advanced and longest-running healthcare quality registers in Finland. This has been a good starting point for the involvement of this registry as one of nine quality registers in the Finnish Institute of Health and Welfare's quality register project, which aims to develop collaborative quality registers. The future aim is to combine data from different registers, thereby improving the possibilities for monitoring the quality of care and addressing potential problems. This requires the acquisition of a statutory status for these registers, and the Finnish Registry for Kidney Diseases is involved in this plan. However, ongoing funding of the registries is essential before the plans can move forward.

In the 2020 report, we show that the number of patients on KRT, especially those who have received a kidney transplant, continues to rise steadily. At the end of 2020, there were 1972 patients on dialysis and 3324 patients with a functioning kidney transplant. The number of patients on KRT increased by 2% during 2020. In 2020, altogether 522 patients started KRT and 263 patients received a kidney transplant, with these numbers remaining at the same level as in previous years.

This report includes analyses of the effect of the Covid-19 pandemic on patients receiving KRT. By January 2022, a total of 188 Covid-19 infections had been reported among KRT patients, and 18 patients had died because of the disease. The number of infections was the highest in the southern capital region and in men aged 50–69 years. Type 2 diabetes has most often been the primary kidney disease in patients with fatal Covid-19 infection.

Funding of the Finnish Registry for Kidney Diseases has been challenging for several years. Therefore, the recent decision of the Funding Centre for Social Welfare and Health to continue the funding of our register in 2022, as in the previous four years, was crucial. Our goals for this year are to make logging onto the registry system more secure, to update the database program, and to increase treatment modality options to meet the current needs. We thank all of our partners for great co-operation!

Jaakko Helve
Administrative Director

Patrik Finne
Chairman of the Board

Summary of Report

Finnish population (pages 9–10)

The Finnish population increased by 2.9% in 2010–2020. The population has grown in seven healthcare districts, most in Helsinki-Uusimaa, Åland, and Pirkanmaa, and the population has decreased in 14 healthcare districts, most in Itä-Savo, Kainuu, Länsi-Pohja, and Etelä-Savo. The proportion of inhabitants older than 65 years has increased in all healthcare districts in 2010–2020. In 2020, the proportion of inhabitants under the age of 20 years was highest in the northern region (23%), inhabitants aged 20–64 years in the southern region (60%), and inhabitants over 75 years in the eastern, western, and south-western regions (11%).

Incidence of KRT, number of patients entering KRT (pages 11–18)

In 2020, the incidence of kidney replacement therapy (KRT) was 94 patients per million inhabitants. Age- and sex-standardized incidence increased in 2013–2016, decreasing thereafter. Variation between regions has been small, although the incidence increased in the northern region more during the last years than in the other regions. Significant variation has emerged in the incidence of KRT between healthcare districts in 2016–2020, ranging from 61 patients per year per million inhabitants in Åland to 147 in Keski-Pohjanmaa. The difference is explained at least partly by differences in the age structure of the population. The number of new KRT patients has been higher during the last years than a decade ago, with the increase being greatest in the age group over 65 years and in women. Of new KRT patients, the incidence of KRT is the highest in the group of men 75 years or older. During the last five years the incidence was the highest in the age group 65–74 years in all regions other than the southern region where the incidence was the highest in the age group of 75 years and over. The incidence of RRT in Finland is still low in an international comparison.

In 2020, the most common kidney disease diagnosis of patients entering KRT was type 2 diabetes, as in

the last 20 years. Glomerulonephritis and type 1 diabetes were the second most common kidney disease diagnoses. The incidence of polycystic degeneration and nephrosclerosis has increased in this millennium, while the incidence of amyloidosis and tubulointerstitial nephritis has decreased. In 2020, three months after the start of KRT, one-third of the patients were on home dialysis (peritoneal dialysis or home hemodialysis) or had received a kidney transplantation; this proportion has been stable over the past ten years. The proportion of patients receiving kidney transplantation within three months of KRT start has increased to 4–5%. The proportion of home dialysis has varied between 0% and 45% in healthcare districts, but the variation was smaller between regions (24–36%).

Prevalence of KRT, number of patients at end of year (pages 19–26)

At the end of 2020, there were 1972 dialysis patients and 3324 kidney transplantation patients in Finland. The number of dialysis patients decreased by 1% and the number of kidney transplantation patients increased by 4% relative to the end of 2019. The prevalence of KRT was 957 per million inhabitants. The prevalence has increased by 20% in ten years, increasing in all regions. The prevalence has increased the most in the age group 75 years and over (34%) and the least in the age group 65–74 years (5%). The prevalence ranged from 803 to 1269 patients per million inhabitants in healthcare districts. Of all dialysis patients, 22% were on hemodialysis (16% on peritoneal dialysis and 6% on home hemodialysis) at the end of 2020. In the healthcare districts, the proportion of home dialysis varied from 0% to 44%. The most frequent kidney disease diagnosis of all KRT patients and kidney transplantation patients was glomerulonephritis. The most frequent kidney disease diagnosis of hemodialysis patients was type 2 diabetes and of peritoneal dialysis patients type 1 diabetes. The number of patient-years in patients with type 2 diabetes with kidney transplantation has increased by 64% in ten years.

Changes in type of treatment (page 27)

In 2020, altogether 522 new patients started KRT, 409 patients died, and dialysis was discontinued in 21 patients after recovery of kidney function. Treatment was terminated in 61 patients, most of whom had been on hemodialysis (56 patients). During the year 263 patients received a kidney transplant, which is at the same level as in previous years despite the impact of Covid-19. The number of kidney transplantation patients increased by 4%, the number of home hemodialysis patients decreased by 15%, and the number of peritoneal dialysis patients and in-center hemodialysis patients remained unchanged in 2020.

KRT patients' mortality (page 28)

In 2020, the mortality of KRT patients was 78 deaths per 1000 patient-years. During the past ten years age- and sex-standardized mortality has decreased.

Quality of care (pages 29–42)

Since Report 2012, analyses of quality of care have been presented openly according to healthcare district and region. The most central analyses are repeated in each annual report.

At the end of 2020, 81% of dialysis patients reached a hemoglobin concentration of ≥ 100 g/l, but the proportion of patients with a hemoglobin concentration < 100 g/l has increased in ten years from 14% to 19%. No temporal changes have occurred in serum phosphorus concentrations, nor have significant differences emerged between healthcare districts and regions in the treatment of hyperphosphatemia. Serum PTH ranged from 150 to 600 ng/l in 62% of dialysis patients in 2020. In recent years, there has been no significant change in this proportion, but between healthcare districts significant differences are present. The median estimated GFR of those who started KRT in 2020 was 7.7 ml/min/1.73 m². There were significant differences between healthcare districts and regions in estimated GFR levels of patients starting KRT between 2016 and 2020. No regional differences emerged in estimated GFR levels in those living with a functioning kidney transplant. The proportion of survivors five years after kidney transplantation

with a functioning transplant decreased from 86% to 80% when compared over the years 2000–2004 and 2015–2020. The explanation for this is probably the expanded criteria for transplant recipients and donors. There was no difference between regions. In 2020, the proportion of fistula or graft for vascular access in new hemodialysis patients was 39%. The proportion has decreased from the past five years' level and has varied significantly between healthcare districts and regions. In all patients on hemodialysis, the proportion of catheters was 15% at the end of 2020. Of patients on hemodialysis at the end of 2020, the proportion reaching therapeutic goals in blood pressure management of $< 140/90$ mmHg increased from 39% to 43% compared with 2019. The proportion of kidney transplant patients reaching the blood pressure target level of $< 130/80$ mmHg has increased gradually but was still only 22%. In 2020, 72% of the kidney transplant patients reached a target serum LDL cholesterol level of < 2.6 mmol/l, but the proportion varied significantly between healthcare districts and regions. In 2020, 10% of patients were waitlisted for kidney transplantation at the beginning of KRT. The proportion has increased significantly from previous years. However, the proportion of those who were waitlisted within 180 days of start of KRT was unchanged compared with previous years. Younger patients were waitlisted faster than older patients. Within 90 days of start of KRT, 12% of patients had been waitlisted, and the proportion varied significantly by region (7–15%).

Covid-19 (pages 43–44)

Altogether 188 Covid-19 infections were reported in KRT patients by 17 January 2022. Most of the infections were in the Helsinki and Uusimaa healthcare district and the highest incidence of infections was in men aged 50–69 years. The number of infections has followed the national epidemic situation. The number of Covid-19-related deaths in these patients was 18. Patients with type 2 diabetes had the highest number of Covid-19 infections and deaths relative to patient-years. Of all Covid-19-infected KRT patients, 9.6% died of the disease.

Table 1. The Finnish population (as thousands of inhabitants) and its distribution in healthcare districts
Finnish Registry for Kidney Diseases 2010–2020

Healthcare district		Year					Change (%) 2010–2020
		2010	2015	2018	2019	2020	
1	Helsinki-Uusimaa	1528	1616	1667	1686	1699	11,2
3	Varsinais-Suomi	468	477	481	482	484	3,4
4	Satakunta	226	223	219	217	215	-4,6
5	Kanta-Häme	175	175	171	171	171	-2,3
6	Pirkanmaa	511	527	535	537	540	5,6
7	Päijät-Häme	213	212	211	210	209	-1,6
8	Kymenlaakso	175	172	167	164	163	-7,2
9	Etelä-Karjala	133	131	129	128	127	-4,5
10	Etelä-Savo	106	103	100	99	98	-8,0
11	Itä-Savo	46	43	41	40	40	-12,6
12	Pohjois-Karjala	170	168	166	164	164	-3,7
13	Pohjois-Savo	248	248	246	244	244	-1,8
14	Keski-Suomi	248	252	253	253	253	1,7
15	Etelä-Pohjanmaa	198	197	194	193	192	-3,2
16	Vaasa	166	170	170	169	169	1,9
17	Keski-Pohjanmaa	78	79	78	77	77	-1,2
18	Pohjois-Pohjanmaa	395	407	409	410	411	4,0
19	Kainuu	79	75	73	72	72	-8,9
20	Länsi-Pohja	65	63	61	60	60	-8,6
21	Lappi	118	118	117	117	117	-1,0
22	Åland	28	29	30	30	30	7,6
Region							
	South	1837	1919	1963	1978	1989	8,3
	Southwest	888	900	900	898	899	1,2
	West	1097	1111	1112	1111	1112	1,4
	East	818	815	805	800	797	-2,5
	North	736	742	739	737	737	0,1
Entire country		5375	5487	5518	5525	5534	2,9

Figure 1. Healthcare districts and regions in Finland
Finnish Registry for Kidney Diseases 2020

On 31 December 2020, the population of Finland was 5.534 million (Table 1, Source: Statistics Finland). During the past ten years the population of the country has increased by 2.9%, 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 (more than 5%) in Helsinki-Uusimaa, Åland, and Pirkanmaa. In the healthcare districts of Itä-Savo, Kainuu, Länsi-Pohja, Etelä-Savo, and Kymenlaakso, 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.

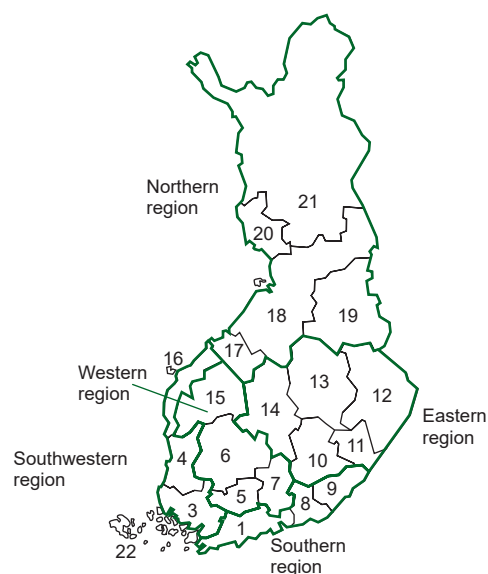


Table 2. The Finnish population (as thousands of inhabitants) according to region, age group, and sex
Finnish Registry for Kidney Diseases 2010–2020

Region	2010					2020				
	0– 19 y (%)	20– 64 y (%)	65– 74 y (%)	≥75 y (%)	Total	0– 19 y (%)	20– 64 y (%)	65– 74 y (%)	≥75 y (%)	Total
South										
Men	212 (24)	566 (64)	71 (8)	42 (5)	891 (100)	214 (22)	596 (61)	100 (10)	64 (7)	974 (100)
Women	204 (22)	576 (61)	86 (9)	79 (8)	945 (100)	205 (20)	588 (58)	120 (12)	102 (10)	1015 (100)
Total	416 (23)	1142 (62)	158 (9)	121 (7)	1837 (100)	419 (21)	1184 (60)	219 (11)	166 (8)	1989 (100)
Southwest										
Men	100 (23)	264 (60)	42 (10)	30 (7)	436 (100)	94 (21)	253 (57)	58 (13)	40 (9)	445 (100)
Women	95 (21)	258 (57)	47 (10)	52 (12)	452 (100)	89 (20)	243 (53)	64 (14)	59 (13)	454 (100)
Total	195 (22)	522 (59)	90 (10)	82 (9)	888 (100)	182 (20)	496 (55)	122 (14)	100 (11)	899 (100)
West										
Men	126 (23)	328 (61)	50 (9)	34 (6)	538 (100)	118 (21)	311 (57)	72 (13)	48 (9)	549 (100)
Women	121 (22)	318 (57)	58 (10)	63 (11)	559 (100)	112 (20)	299 (53)	80 (14)	72 (13)	563 (100)
Total	246 (22)	645 (59)	108 (10)	97 (9)	1097 (100)	230 (21)	610 (55)	152 (14)	120 (11)	1112 (100)
East										
Men	90 (22)	245 (61)	40 (10)	28 (7)	404 (100)	80 (20)	221 (56)	58 (15)	37 (9)	396 (100)
Women	87 (21)	233 (56)	44 (11)	49 (12)	414 (100)	77 (19)	211 (52)	60 (15)	54 (13)	402 (100)
Total	177 (22)	479 (59)	84 (10)	78 (9)	818 (100)	156 (20)	432 (54)	118 (15)	91 (11)	797 (100)
North										
Men	95 (26)	221 (60)	32 (9)	22 (6)	369 (100)	88 (24)	206 (55)	48 (13)	30 (8)	371 (100)
Women	90 (25)	206 (56)	34 (9)	36 (10)	366 (100)	84 (23)	191 (52)	49 (13)	42 (11)	366 (100)
Total	185 (25)	427 (58)	66 (9)	58 (8)	736 (100)	172 (23)	397 (54)	97 (13)	71 (10)	737 (100)
Entire country										
Men	623 (24)	1624 (62)	235 (9)	156 (6)	2638 (100)	593 (22)	1587 (58)	336 (12)	219 (8)	2734 (100)
Women	597 (22)	1591 (58)	270 (10)	279 (10)	2737 (100)	566 (20)	1532 (55)	372 (13)	329 (12)	2800 (100)
Total	1220 (23)	3214 (60)	505 (9)	436 (8)	5375 (100)	1159 (21)	3119 (56)	708 (13)	548 (10)	5534 (100)

Table 2 shows the age and sex distribution of the Finnish population at the end of 2010 and 2020. The age of the Finnish population has increased during the past ten years. The proportion of inhabitants older than 75 years has increased from 8% to 10%, and the proportion of 65–74-year-olds from 9% to 13%.

At the end of 2020, the proportion of inhabitants older than 65 years was the smallest, 19%, in the southern region, while it was 23–26% in the other regions. During the past ten years the proportion of inhabitants older than 65 years has increased by 33% in the entire country, and the

growth has been the largest in the southern region.

The proportion of inhabitants aged 20–64 years was largest in the southern region, 60%, while it was 54–55% in the other regions. The proportion of 20–64-year-olds country-wide has decreased from 60% to 56%.

At the end of 2020, the proportion of inhabitants younger than 20 years was the largest, 23%, in the northern region, and it was 20–21% in the other regions. The number of inhabitants younger than 20 years has decreased by 5% during the past ten years.

Table 3. Number of new KRT patients and incidence of KRT by healthcare district and region
Finnish Registry for Kidney Diseases 2010–2020

Healthcare district	Number of new KRT patients						Incidence of KRT/million inhabitants						
	2010	2015	2018	2019	2020	2016–2020 on average	2010	2015	2018	2019	2020	2016–2020 on average	
1	Helsinki-Uusimaa	118	128	144	149	124	143	77	79	86	88	73	86
3	Varsinais-Suomi	33	46	43	44	46	49	70	96	89	91	95	103
4	Satakunta	19	22	25	22	17	25	84	99	114	101	79	113
5	Kanta-Häme	20	21	19	21	19	21	115	120	111	123	111	121
6	Pirkanmaa	45	53	48	67	60	57	88	101	90	125	111	107
7	Päijät-Häme	22	16	11	19	19	20	103	75	52	90	91	96
8	Kymenlaakso	17	18	14	15	16	14	97	105	84	91	98	83
9	Etelä-Karjala	21	17	14	13	11	15	158	130	109	102	87	113
10	Etelä-Savo	8	16	11	6	11	10	76	155	110	61	113	96
11	Itä-Savo	5	7	1	4	3	4	110	161	24	99	75	87
12	Pohjois-Karjala	14	25	26	13	15	18	82	149	157	79	92	111
13	Pohjois-Savo	21	33	29	16	32	25	85	133	118	66	131	103
14	Keski-Suomi	22	21	18	24	20	23	89	83	71	95	79	90
15	Etelä-Pohjanmaa	18	20	17	18	23	21	91	101	87	93	120	110
16	Vaasa	15	19	16	17	16	18	90	112	94	100	94	106
17	Keski-Pohjanmaa	7	13	13	13	15	11	90	165	167	168	195	147
18	Pohjois-Pohjanmaa	35	26	36	43	50	40	89	64	88	105	122	99
19	Kainuu	6	13	8	12	8	9	76	173	109	166	112	123
20	Länsi-Pohja	5	9	10	13	6	8	77	143	163	216	101	134
21	Lappi	6	7	11	10	11	10	51	59	94	86	94	82
22	Åland	2	5	3	2	0	2	71	173	101	67	0	61
Region	South	156	163	172	177	151	172	85	85	88	89	76	87
	Southwest	69	92	87	85	79	94	78	102	97	95	88	105
	West	105	110	95	125	121	120	96	99	85	112	109	108
	East	70	102	85	63	81	80	86	125	106	79	102	99
	North	59	68	78	91	90	79	80	92	106	123	122	106
Entire country		459	535	517	541	522	544	85	97	94	98	94	99
	Children <15 y	8	13	8	5	8	7	9	15	9	6	9	8

Table 3 shows the number of new KRT (dialysis and kidney transplantation) patients and the incidence of KRT according to healthcare district and region. In 2020, the incidence was 94 new patients per million inhabitants. In 2016–2020, the average incidence was highest in the western region and lowest in the southern region. In the healthcare districts, the average incidence during the same period was lowest in Åland (61 new KRT patients per million inhabitants) and highest in Keski-Pohjanmaa (147 per million inhabitants).

Figure 2. Incidence of KRT by healthcare district
Finnish Registry for Kidney Diseases 2020



The healthcare districts shown on the map are grouped according to the incidence of KRT at the end of 2020 (Figure 2). The incidence per million inhabitants was <90 in six districts, 90–110 in seven districts, and >110 in eight districts. The borders of the regions are indicated with thick lines.

Table 4. Number of new KRT patients by age group in healthcare districts and regions
Finnish Registry for Kidney Diseases 2016–2020

Healthcare district		Average annual number of new KRT patients in 2016–2020 by age group (y)						Incidence*/million inhabitants in 2016–2020 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	3.6	22.4	48.4	37.2	31.6	143	10	38	115	218	268	86
3	Varsinais-Suomi	0.4	5.8	15.2	17.0	11.0	49	4	38	124	272	228	103
4	Satakunta	0.4	4.2	10.2	6.8	3.2	25	9	71	176	211	124	113
5	Kanta-Häme	0.2	3.8	7.6	4.8	4.4	21	6	82	162	200	242	121
6	Pirkanmaa	0.6	8.2	20.6	18.6	9.4	57	5	47	156	284	186	107
7	Päijät-Häme	0.0	2.4	8.8	5.6	3.4	20	0	42	156	177	146	96
8	Kymenlaakso	0.2	1.4	5.0	4.6	2.6	14	6	32	107	181	131	83
9	Etelä-Karjala	0.0	2.4	5.0	4.2	3.0	15	0	68	141	223	193	113
10	Etelä-Savo	0.0	2.4	3.6	2.2	1.4	10	0	98	127	136	108	96
11	Itä-Savo	0.0	0.6	0.8	1.2	1.0	4	0	66	66	167	171	87
12	Pohjois-Karjala	0.2	2.2	7.6	6.2	2.2	18	6	48	170	254	120	111
13	Pohjois-Savo	1.0	3.8	8.6	7.2	4.6	25	20	54	130	212	176	103
14	Keski-Suomi	0.8	4.0	8.6	6.0	3.4	23	15	50	138	189	142	90
15	Etelä-Pohjanmaa	0.6	3.8	6.4	6.4	4.2	21	14	73	127	239	197	110
16	Vaasa	0.8	1.8	3.8	5.4	6.2	18	21	34	94	261	354	106
17	Keski-Pohjanmaa	0.0	1.6	2.8	3.2	3.8	11	0	74	148	314	490	147
18	Pohjois-Pohjanmaa	1.0	5.4	10.6	14.8	8.6	40	9	42	109	330	260	99
19	Kainuu	0.2	0.8	4.0	2.4	1.6	9	14	44	192	213	181	123
20	Länsi-Pohja	0.0	0.8	3.6	2.4	1.4	8	0	51	216	265	209	134
21	Lappi	0.2	2.0	4.2	2.6	0.6	10	9	60	129	163	49	82
22	Åland	0.0	0.2	0.8	0.4	0.4	2	0	23	99	107	142	61
Region South		3.8	26.2	58.4	46.0	37.2	172	9	39	117	214	242	87
Southwest		1.6	12.0	30.0	29.6	20.8	94	9	44	131	249	221	105
West		1.4	18.2	43.4	35.4	21.4	120	6	55	152	239	189	108
East		2.0	13.0	29.2	22.8	12.6	80	12	57	137	201	144	99
North		1.4	10.6	25.2	25.4	16.0	79	8	49	135	278	233	106
Entire country		10.2	80.0	186.2	159.2	108.0	544	9	46	132	232	209	99

*Average annual incidence of KRT in subgroup

Table 4 presents the average annual number of new KRT patients and the incidence of KRT in 2016–2020 according to healthcare district, region, and age group. The incidence was highest among 65–74-year-olds and varied in this age group from 107 to 330 in the healthcare districts.

In the age group of 75 years and over, the incidence was 209 new KRT patients per million age-related inhabitants, with a range of 49–490 in healthcare districts and a range of 144–242 in regions.

Table 5. Number of new KRT patients by age group and sex
Finnish Registry for Kidney Diseases 2010–2020

Age group		Number of new KRT patients					Incidence of KRT/million inhabitants				
		2010	2015	2018	2019	2020	2010	2015	2018	2019	2020
0–19 y	Men	5	10	8	4	7	8	16	13	7	12
	Women	7	8	4	3	4	12	14	7	5	7
	Total	12	18	12	7	11	10	15	10	6	9
20–44 y	Men	40	50	41	46	44	47	57	46	52	49
	Women	18	32	24	28	44	22	39	29	33	53
	Total	58	82	65	74	88	35	48	38	43	51
45–64 y	Men	120	131	125	108	102	157	180	178	154	147
	Women	49	68	69	69	63	63	92	98	99	91
	Total	169	199	194	177	165	110	136	137	127	119
65–74 y	Men	92	114	103	105	103	391	375	313	313	307
	Women	42	40	49	58	52	155	118	135	156	140
	Total	134	154	152	163	155	265	240	219	231	219
≥75 y	Men	58	54	65	77	71	371	296	325	373	325
	Women	28	32	29	43	32	100	107	93	135	97
	Total	86	86	94	120	103	197	179	184	229	188
Total	Men	315	359	342	340	327	119	133	126	125	120
	Women	144	180	175	201	195	53	65	63	72	70
	Total	459	539	517	541	522	85	98	94	98	94

Table 5 shows the number of new KRT patients and the incidence of KRT according to age group and sex in 2010–2020. The number of new KRT patients has been bigger during the last years. The increase was mainly observed in the age groups of 65 years and over and in women. Of the new KRT patients in 2020, 63% were men.

The incidence was 94 new patients per million inhabitants in 2020. The highest incidence was in the group of men 75 years and over. The incidence of KRT in men compared to women has slightly decreased during the last ten years.

Figure 3. Standardized incidence of KRT in regions
Finnish Registry for Kidney Diseases 2010–2020

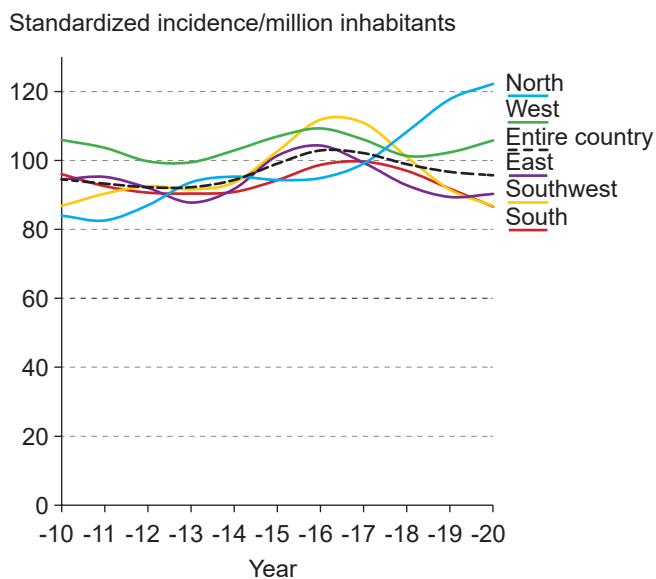


Figure 4. Standardized incidence of KRT in regions
90 days after start of KRT
Finnish Registry for Kidney Diseases 2010–2020

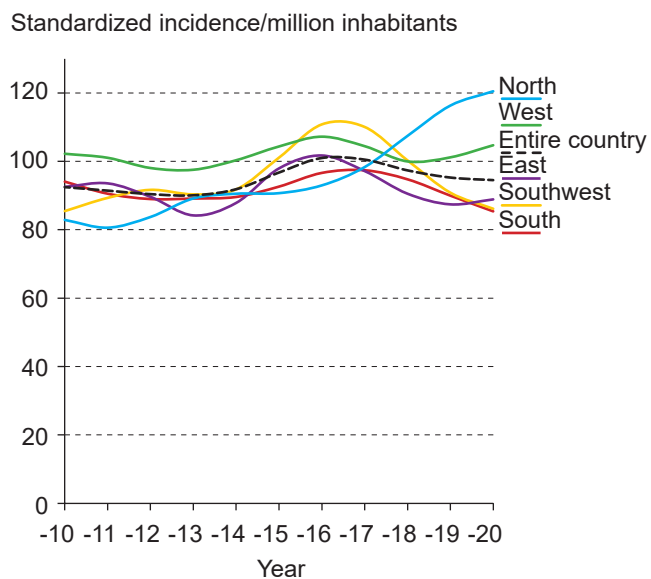
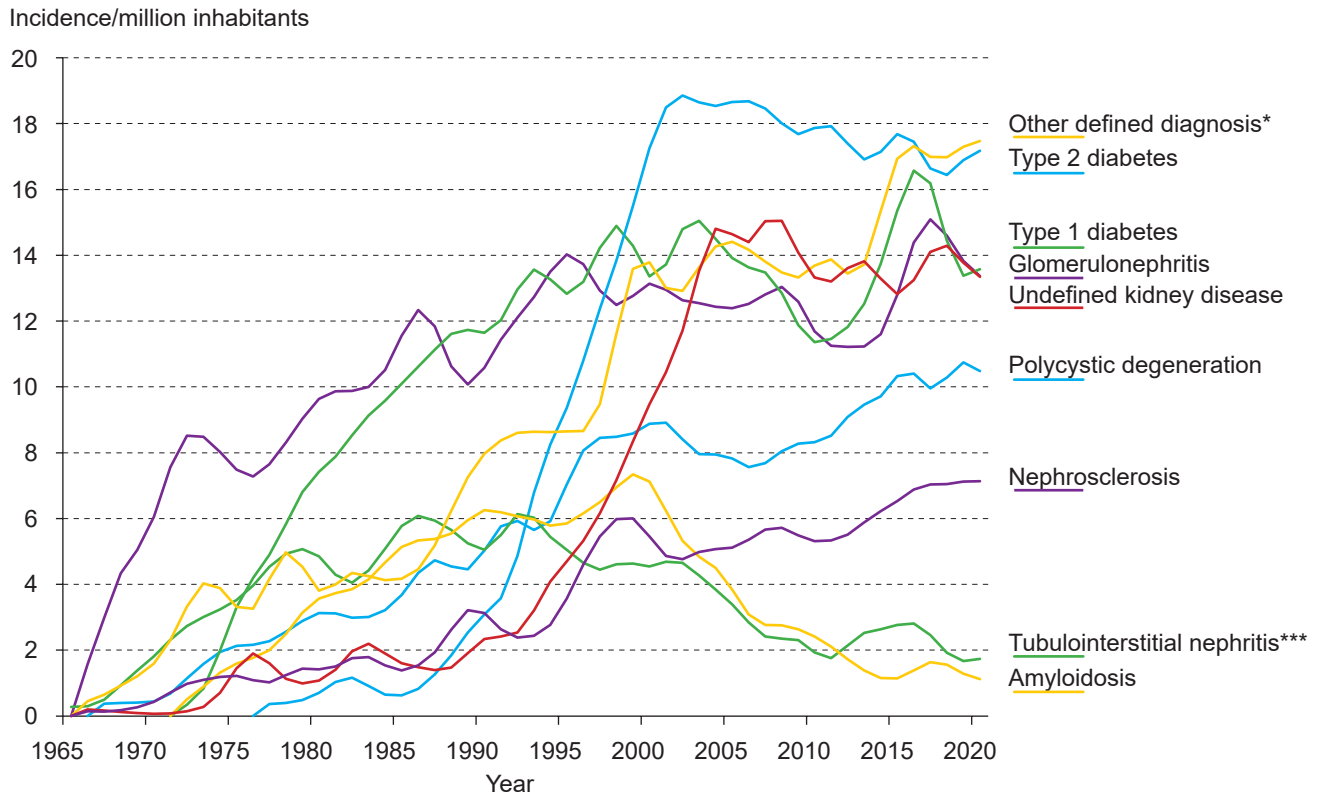


Figure 3 shows the regional incidence of KRT in 2010–2020 as smoothed averages. The incidence rates are age- and sex-standardized using the Finnish general population on 31 December 2020 as the reference. Population changes in 2010–2020 have been taken into consideration. Standardization removes the effect of age and sex on regional differences in incidence rates. Nationwide, the standardized incidence increased since 2014, but has decreased again after 2017. Regional differences in standardized incidence are small.

Figure 4 shows the age- and sex-standardized regional incidence of KRT 90 days after the start of KRT. The Finnish Registry for Kidney Diseases does not store data on patients who have regained renal function within 90 days of start of KRT because in that case KRT is not considered chronic. However, the registry does store information on patients who died or moved abroad within 90 days of start of KRT, but these patients were excluded from Figure 4.

Figure 5. Incidence of KRT according to diagnosis
Finnish Registry for Kidney Diseases 1965–2020



*For example, other systemic diseases, urinary tract obstruction, congenital diseases, and malignancies
 **ICD-10 codes I12, I13, I70.1, and N28.0
 ***ICD-10 codes N10, N11, and N12

The incidence of KRT according to diagnosis appears as smoothed averages in Figure 5. Until the end of the 1990s, the incidence increased in almost all diagnostic groups, but thereafter the increase stopped. In the beginning of the 2010s the incidence of type 1 diabetes and glomerulonephritis was larger than before, but now the incidence of these diagnoses have decreased. The incidence of nephrosclerosis and polycystic degeneration has steadily increased. The incidence of tubulointerstitial nephritis and amyloidosis has decreased.

Type 2 diabetes has been the leading cause of end-stage renal disease since 1999, and glomerulonephritis and type 1 diabetes have been the next most common causes. The group of other defined diagnoses has grown considerably, being larger than type 2 diabetes in 2020.

In 2020, altogether 96 new KRT patients had been assigned the “other defined diagnosis”. The most common diagnoses were urinary tract obstruction (n=18), vasculitis (n=10), myeloma (n=9), systemic lupus erythematosus (n=4), thrombotic microangiopathy (n=3), Alport syndrome (n=2), and congenital nephrosis of Finnish type (n=2).

Of the 96 patients, 32 had an ICD-10 code of N18.8, indicating other defined kidney disease, but no further specification was given. All of these patients had an ERA-EDTA diagnosis code, specifying the diagnosis for 13 patients, whereas for 19 patients the kidney disease remained unknown.

An ICD-10 code was N18.9, indicating undefined kidney disease, in 62 patients. Of these patients, ERA-EDTA diagnosis code specified the diagnosis for 4 patients.

Figure 6. Type of treatment at 90 days from start of KRT
Finnish Registry for Kidney Diseases 2010–2020

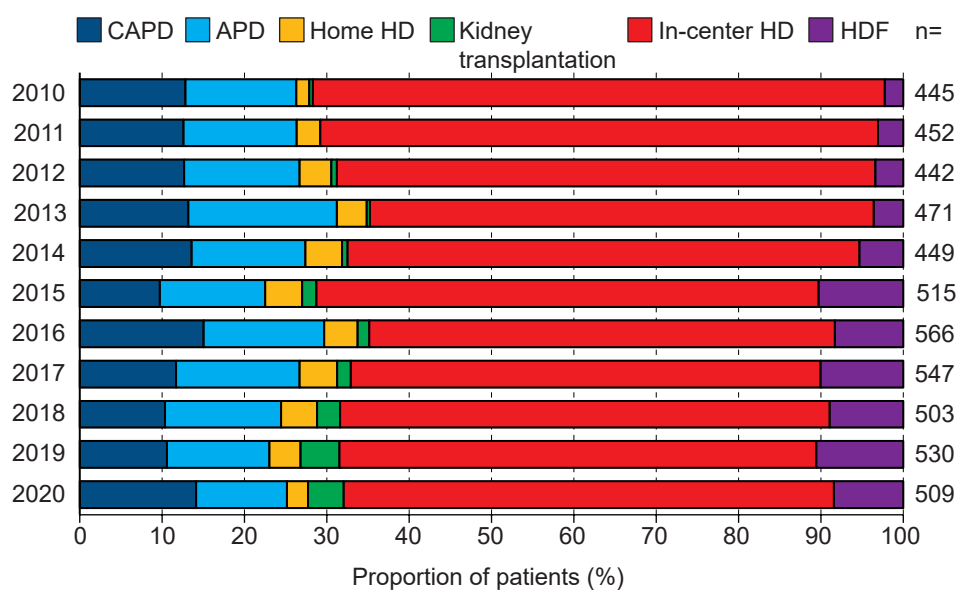


Figure 7. Type of treatment at 90 days from start of KRT in healthcare districts and regions
Finnish Registry for Kidney Diseases 2016–2020

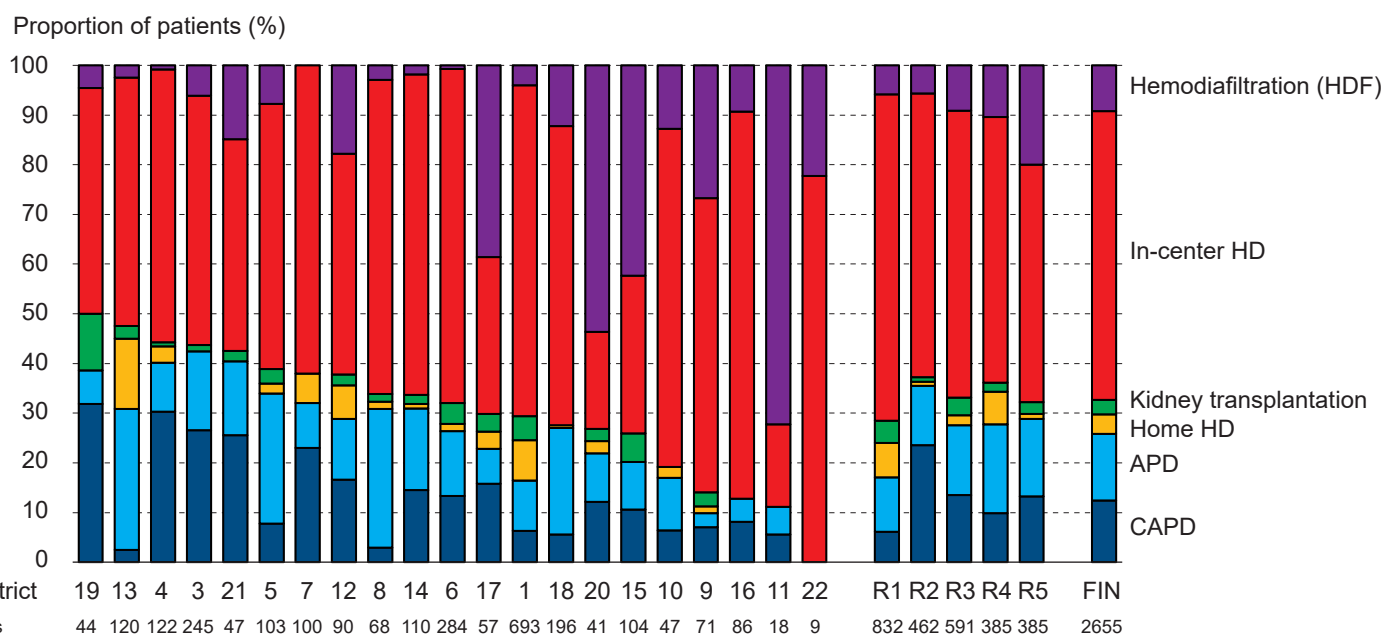


Figure 6 presents the number of KRT patients aged 20 years and over at 90 days from start of KRT in 2010–2020 according to type of treatment. The proportion of patients on in-center hemodialysis and hemodiafiltration has remained stable at an average of 68%. However, the proportion of patients on hemodiafiltration has increased. During the last years the proportion of patients on home hemodialysis (home HD) has decreased from 5% to 3%. The proportion of patients receiving a kidney transplant at 90 days from start of KRT has increased to 4–5% when it was previously less than 1%. The proportion of patients on continuous ambulatory peritoneal dialysis (CAPD) or automated peritoneal dialysis (APD) has varied between 23% and 31%. The proportion of patients on CAPD in all peritoneal dialysis

patients increased in 2020 compared to the previous years.

Figure 7 shows according to healthcare district and region the distribution of KRT modalities at 90 days from start of KRT in 2016–2020 of patients older than 20 years. The proportion of patients on home dialysis (CAPD, APD, or home HD) varied in healthcare districts from 0% to 45%. The proportion of APD patients in patients on peritoneal dialysis varied between 18% and 92% in healthcare districts. In southern region the proportion of home dialysis was 24% compared to 30–36% in other regions. The proportion of patients receiving kidney transplant was the highest in southern region. Otherwise there was less variation in distribution of KRT modalities between regions than between healthcare districts.

Figure 8. International comparison of incidence of KRT in 2019
Finnish Registry for Kidney Diseases 2020

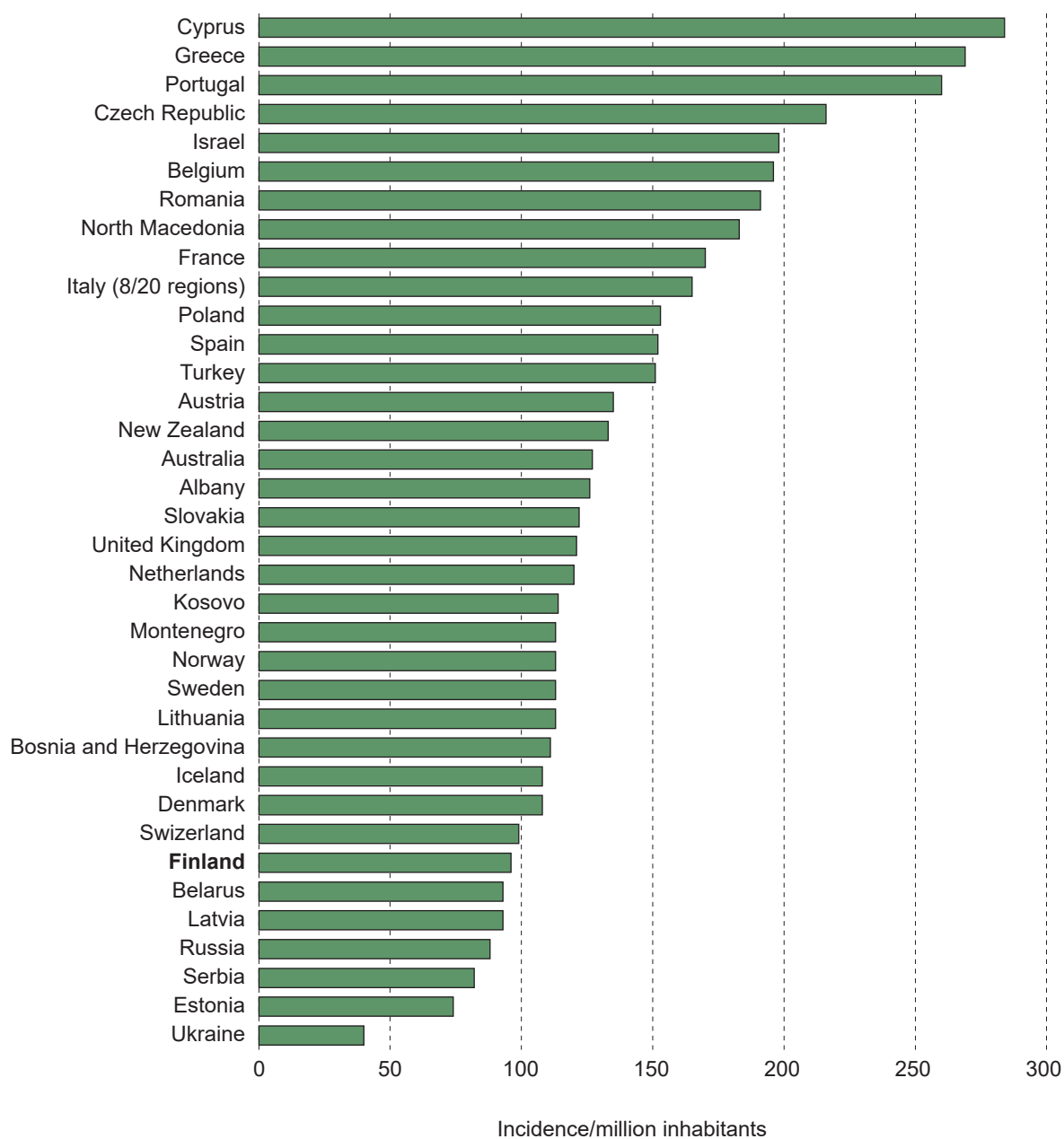


Figure 8 shows the incidence of KRT in 2019 in countries reporting to the ERA-EDTA Registry (Annual Report 2019, <http://www.era-online.org/registry/AnnRep2019.pdf>) and in Australia, and New Zealand (ANZDATA 43rd Annual Report 2020, www.anzdata.org.au). In 2019, the incidence of KRT in Finland was one of the lowest in Europe. In the Nordic countries, relative to Finland, the incidence in Norway and Sweden was 18% higher, and in Denmark and Iceland 13% higher. In Cyprus, Greece and Portugal, the incidence was more than 2.5-fold that in Finland.

Table 6. Patients on KRT at end of year according to healthcare district and region
Finnish Registry for Kidney Diseases 2010–2020

Healthcare district		Number of KRT patients					Prevalence of KRT/million inhabitants				
		2010	2015	2018	2019	2020	2010	2015	2018	2019	2020
1	Helsinki-Uusimaa	1145	1303	1451	1460	1485	749	806	870	866	874
3	Varsinais-Suomi	396	429	456	465	468	845	899	947	964	967
4	Satakunta	238	219	255	248	237	1054	982	1166	1144	1100
5	Kanta-Häme	134	157	173	180	190	768	899	1010	1053	1114
6	Pirkanmaa	434	481	521	544	563	849	913	974	1013	1043
7	Päijät-Häme	178	183	203	210	211	836	861	961	1000	1007
8	Kymenlaakso	142	142	134	132	134	810	827	804	803	823
9	Etelä-Karjala	147	153	164	160	161	1106	1167	1274	1252	1269
10	Etelä-Savo	89	101	100	100	100	840	978	998	1012	1025
11	Itä-Savo	49	51	50	49	47	1074	1174	1218	1217	1179
12	Pohjois-Karjala	135	146	164	160	161	795	867	991	973	984
13	Pohjois-Savo	223	264	276	270	281	899	1064	1124	1105	1154
14	Keski-Suomi	156	182	205	208	215	628	722	811	823	851
15	Etelä-Pohjanmaa	124	131	161	163	172	625	664	829	844	895
16	Vaasa	112	142	158	164	168	674	834	931	968	992
17	Keski-Pohjanmaa	61	69	80	81	88	782	878	1030	1048	1141
18	Pohjois-Pohjanmaa	286	308	339	342	356	723	756	828	834	866
19	Kainuu	62	69	72	76	77	788	916	985	1051	1074
20	Länsi-Pohja	64	55	59	65	61	980	872	964	1078	1023
21	Lappi	74	79	87	93	94	626	671	741	796	803
22	Åland	24	25	30	29	27	857	863	1007	970	896
Region	South	1434	1598	1713	1752	1780	781	833	873	886	895
	Southwest	770	815	899	906	900	867	906	999	1009	1001
	West	870	952	1058	1097	1136	793	857	951	987	1021
	East	652	744	795	787	804	797	913	987	983	1008
	North	547	580	637	657	676	744	782	862	892	918
Entire country		4273	4689	5102	5199	5296	795	855	925	941	957

Table 6 presents the number of KRT patients and the prevalence of KRT on 31 December 2010–2020. In the entire country, the prevalence at the end of 2020 was 957 KRT patients per million inhabitants. On 31 December 2020, the prevalence was the highest in the western region and the lowest in the southern region. In the healthcare districts, the prevalence varied between 803 and 1269 patients per million inhabitants.

In the entire country, the prevalence has increased by 20%

since 2010 and by 12% since 2015. Since 2015, the prevalence has increased in all regions, the least in the southern region (7%) and the most in the western region (19%). In the healthcare districts, the prevalence has increased over 25% during the past five years in Etelä-Pohjanmaa and Keski-Pohjanmaa. In Kymenlaakso the prevalence slightly decreased and in Etelä-Savo, Itä-Savo, and Åland the prevalence has increased the least.

Table 7. Patients on KRT according to age group and sex
Finnish Registry for Kidney Diseases 2010–2020

Age group		Number of KRT patients					Prevalence of KRT/million inhabitants				
		2010	2015	2018	2019	2020	2010	2015	2018	2019	2020
0–19 y	Men	70	69	74	70	73	112	113	123	117	123
	Women	53	52	51	52	54	89	89	89	91	95
	Total	123	121	125	122	127	101	101	106	104	110
20–44 y	Men	428	449	485	497	498	499	514	547	558	559
	Women	266	242	288	290	310	325	292	344	346	370
	Total	694	691	773	787	808	414	406	448	456	467
45–64 y	Men	1248	1248	1255	1238	1243	1631	1711	1782	1771	1786
	Women	709	739	783	799	793	918	1005	1108	1142	1142
	Total	1957	1987	2038	2037	2036	1273	1357	1444	1456	1465
65–74 y	Men	609	803	910	940	920	2588	2638	2768	2806	2741
	Women	357	435	477	491	506	1321	1287	1310	1321	1359
	Total	966	1238	1387	1431	1426	1911	1927	2002	2025	2014
≥75 y	Men	334	430	485	512	560	2136	2359	2425	2477	2562
	Women	199	222	294	310	339	713	744	942	975	1029
	Total	533	652	779	822	899	1224	1356	1522	1567	1641
Total	Men	2689	2999	3209	3257	3294	1019	1110	1178	1194	1205
	Women	1584	1690	1893	1942	2002	579	607	677	694	715
	Total	4273	4689	5102	5199	5296	795	855	925	941	957

Figure 9. Standardized prevalence of KRT in regions
Finnish Registry for Kidney Diseases 2010–2020

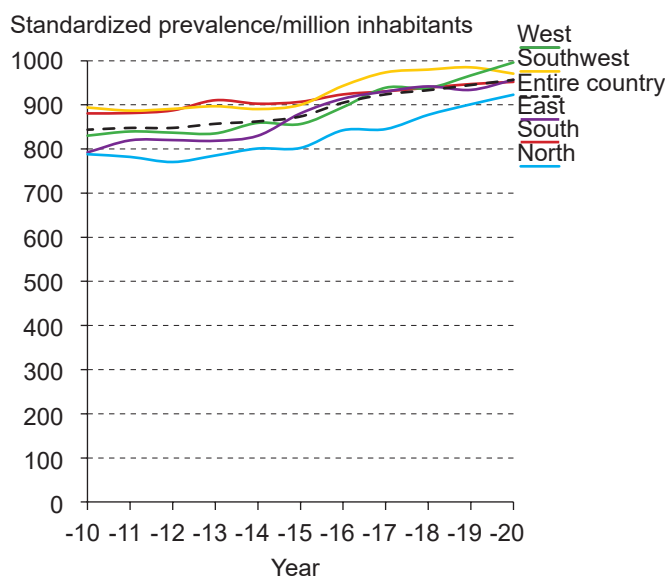
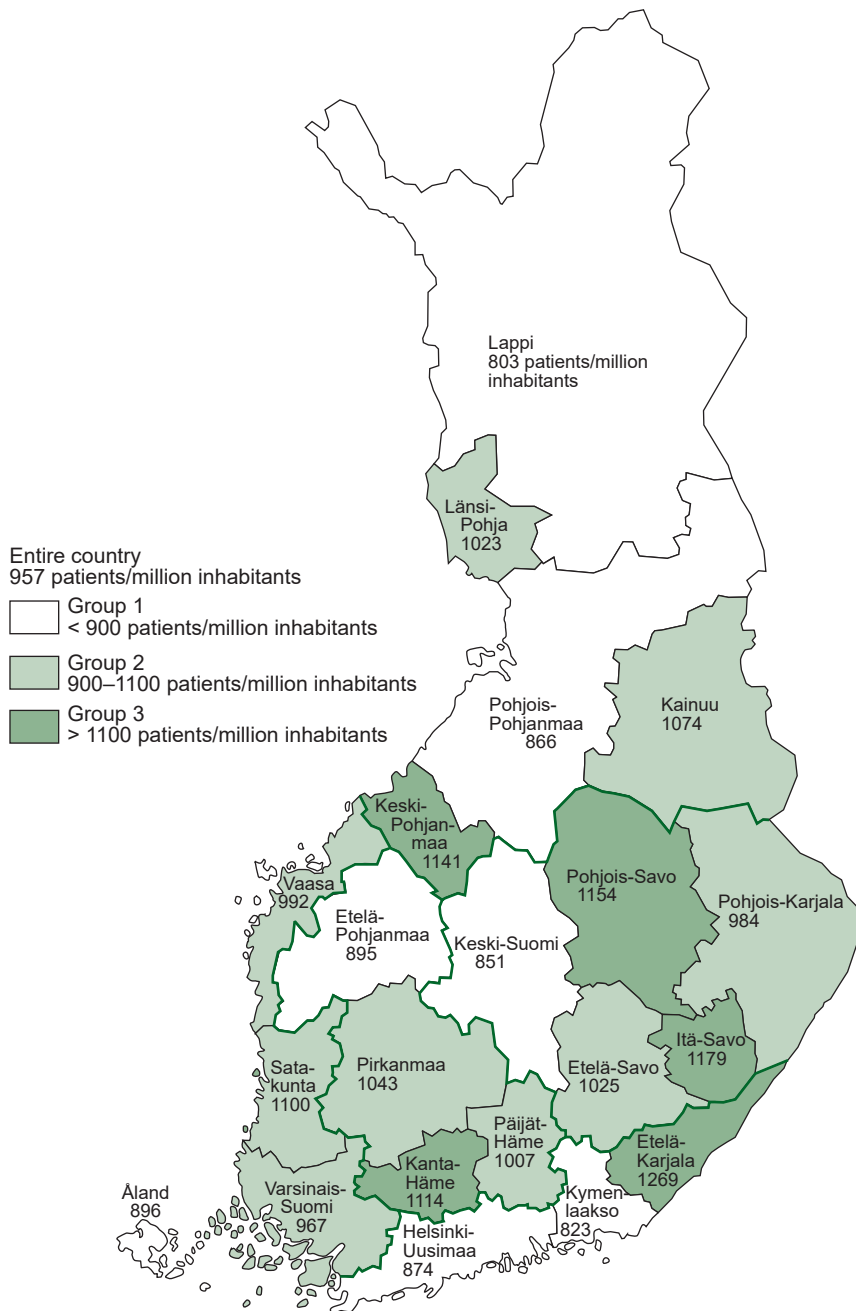


Table 7 shows the number of KRT patients and the prevalence of KRT on 31 December 2010–2020 according to age group and sex. The prevalence has increased by 34% in the age group 75 years and over, by 5% in 65–74-year-olds, by 15% in 45–64-year-olds, by 13% in 20–44-year-olds, and by 9% in 0–19-year-olds. The highest prevalence, observed among men aged 65–74 years at the end of 2020, was 2741 cases per million age-related inhabitants. At the end of 2020, the prevalence was 69% greater among men than among women, and the sex difference was even more pronounced in the oldest age group, in which the prevalence was 2.5-fold higher in men than in women.

Figure 9 shows the age- and sex-standardized prevalence rates for 2010–2020 using the Finnish general population on 31 December 2020 as the reference. The changes in the distribution of age and sex in 2010–2020 have been taken into account. The standardized prevalence rates have increased slowly in recent years, and the differences between regions are small.

Figure 10. Prevalence of KRT on 31 December 2020
Finnish Registry for Kidney Diseases 2020



The healthcare districts shown on the map are grouped according to the prevalence of KRT at the end of 2020 (Figure 10). The prevalence per million inhabitants was <900 in seven districts, 900–1100 in nine districts, and >1100 in five districts. The borders of the regions are indicated with thick lines.

Figure 11. Prevalence of KRT at end of year according to type of treatment
Finnish Registry for Kidney Diseases 1965–2020

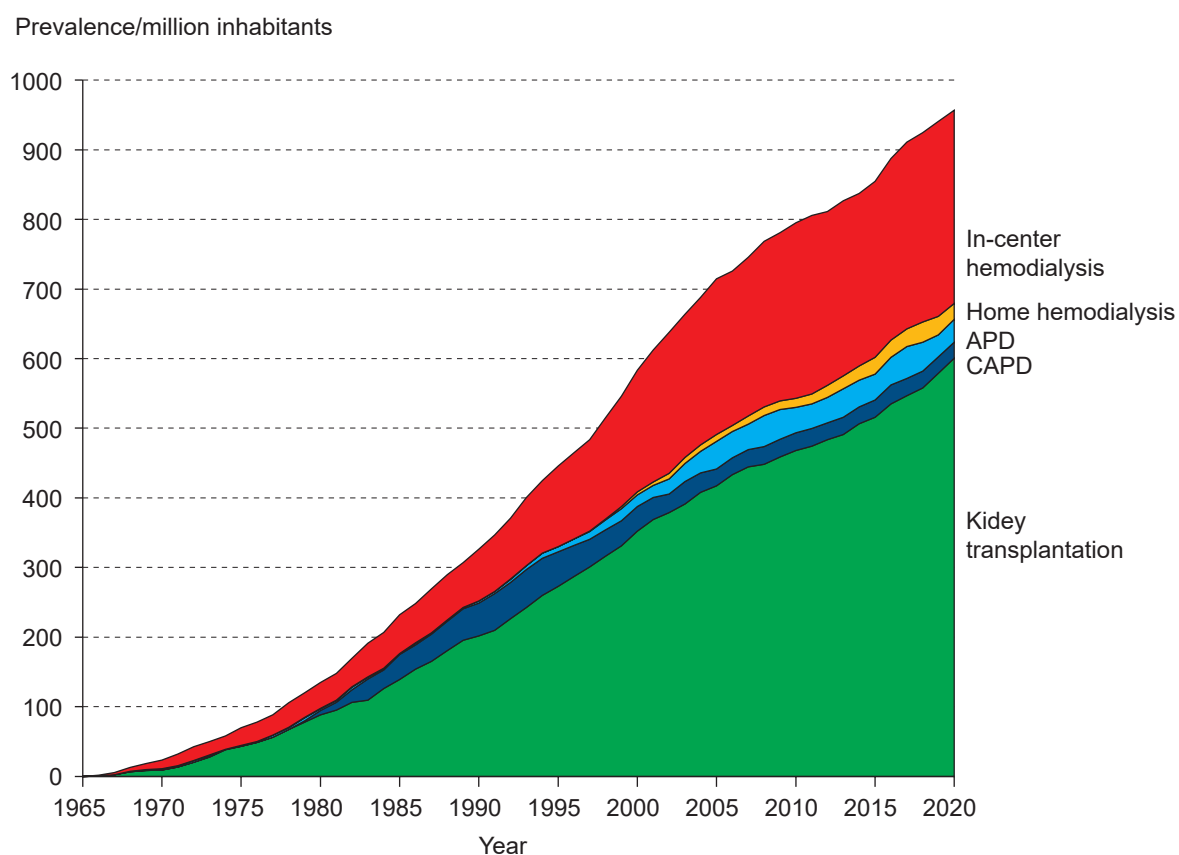


Figure 11 displays the prevalence of KRT according to treatment type. The prevalence of kidney transplantation has grown steadily, increasing by 28% during 2010–2020. At the same time the prevalence of in-center hemodialysis patients increased by 10%, the prevalence of peritoneal dialysis patients decreased by 10%, and the prevalence of home hemodialysis patients 70%. In 2010–2020, the pro-

portion of patients on in-center hemodialysis decreased from 32% to 29%, the proportion of patients with kidney transplantation increased from 59% to 63%, the proportion of patients on home hemodialysis stayed in 2%, and the proportion of patients on peritoneal dialysis decreased from 8% to 6%. Since 2005, the proportion of APD patients of all PD patients has been about 61%.

Table 8. Prevalence of dialysis and kidney transplantation in healthcare districts and regions
Finnish Registry for Kidney Diseases 2010–2020

Healthcare district		Number of dialysis patients/ million inhabitants					Number of kidney transplant patients/ million inhabitants				
		2010	2015	2018	2019	2020	2010	2015	2018	2019	2020
1	Helsinki-Uusimaa	285	301	326	327	319	464	505	522	539	555
3	Varsinais-Suomi	316	379	399	384	374	529	520	548	581	593
4	Satakunta	421	368	485	429	334	633	614	682	715	766
5	Kanta-Häme	424	406	414	445	422	344	492	595	608	692
6	Pirkanmaa	368	374	361	372	393	481	539	613	640	650
7	Päijät-Häme	343	348	374	419	401	493	513	587	581	606
8	Kymenlaakso	433	425	348	365	375	376	402	456	438	448
9	Etelä-Karjala	527	457	528	446	449	579	709	746	806	819
10	Etelä-Savo	340	387	419	385	390	500	591	579	627	636
11	Itä-Savo	482	460	463	422	351	592	713	755	795	828
12	Pohjois-Karjala	318	404	429	377	349	477	463	562	596	636
13	Pohjois-Savo	355	367	366	356	365	544	697	757	749	788
14	Keski-Suomi	250	278	297	285	301	378	445	514	538	550
15	Etelä-Pohjanmaa	272	324	458	419	411	353	339	371	424	484
16	Vaasa	247	311	401	425	390	427	523	530	543	602
17	Keski-Pohjanmaa	410	369	438	466	506	372	509	592	582	635
18	Pohjois-Pohjanmaa	283	282	342	341	372	440	474	486	493	494
19	Kainuu	318	266	287	263	279	470	651	698	788	795
20	Länsi-Pohja	521	460	490	514	436	460	412	474	564	587
21	Lappi	212	229	196	205	231	415	441	545	590	573
22	Åland	464	276	369	301	232	393	587	638	669	664
Region	South	317	323	341	338	332	464	510	531	547	563
	Southwest	334	360	419	400	363	532	546	580	609	638
	West	355	365	389	400	402	438	491	563	587	620
	East	320	355	369	345	344	477	558	619	638	665
	North	310	297	336	339	360	434	485	527	552	558
Entire country		327	339	367	362	356	468	516	558	579	601

Table 8 presents the prevalence of dialysis and kidney transplantation per million inhabitants in healthcare districts and regions in 2010–2020. The prevalence of dialysis has increased by 9% and that of kidney transplantation by 28% during the past ten years. Over the past five years, the prevalence of dialysis has increased by 5% and the prevalence of kidney transplantation by 17%. At the end of 2020, the prevalence of dialysis varied in healthcare districts between 231 and 506 per million inhabitants and that of kidney transplantation between 448 and 828 per million inhabitants. In regions, the prevalence of dialysis varied between 332 and 402 per million inhabitants and that of kidney transplantation between 558 and 665 per million inhabitants.

Table 9. Number of KRT patients at end of year according to type of treatment in healthcare districts and regions
Finnish Registry for Kidney Diseases 2020

Healthcare district		Number of patients on 31 December 2020 (%)						
		CAPD	APD	Home HD	In-center HD	HDF	Tx	Total
1	Helsinki-Uusimaa	31 (2)	29 (2)	57 (4)	314 (21)	111 (7)	944 (64)	1486 (100)
3	Varsinais-Suomi	14 (3)	30 (6)	11 (2)	60 (13)	66 (14)	287 (61)	468 (100)
4	Satakunta	12 (5)	3 (1)	3 (1)	46 (19)	8 (3)	165 (70)	237 (100)
5	Kanta-Häme	3 (2)	12 (6)	2 (1)	29 (15)	26 (14)	118 (62)	190 (100)
6	Pirkanmaa	16 (3)	18 (3)	3 (1)	138 (25)	37 (7)	351 (62)	563 (100)
7	Päijät-Häme	9 (4)	11 (5)	7 (3)	48 (23)	9 (4)	127 (60)	211 (100)
8	Kymenlaakso	2 (1)	6 (4)	4 (3)	30 (22)	19 (14)	73 (54)	134 (100)
9	Etelä-Karjala	0 (0)	0 (0)	9 (6)	6 (4)	42 (26)	104 (65)	161 (100)
10	Etelä-Savo	2 (2)	1 (1)	0 (0)	20 (20)	15 (15)	62 (62)	100 (100)
11	Itä-Savo	0 (0)	2 (4)	0 (0)	1 (2)	11 (23)	33 (70)	47 (100)
12	Pohjois-Karjala	5 (3)	2 (1)	10 (6)	14 (9)	26 (16)	104 (65)	161 (100)
13	Pohjois-Savo	2 (1)	13 (5)	13 (5)	36 (13)	25 (9)	192 (68)	281 (100)
14	Keski-Suomi	3 (1)	11 (5)	1 (0)	31 (14)	30 (14)	139 (65)	215 (100)
15	Etelä-Pohjanmaa	2 (1)	3 (2)	0 (0)	12 (7)	62 (36)	93 (54)	172 (100)
16	Vaasa	4 (2)	5 (3)	2 (1)	21 (13)	34 (20)	102 (61)	168 (100)
17	Keski-Pohjanmaa	6 (7)	5 (6)	1 (1)	2 (2)	25 (28)	49 (56)	88 (100)
18	Pohjois-Pohjanmaa	5 (1)	20 (6)	2 (1)	45 (13)	81 (23)	203 (57)	356 (100)
19	Kainuu	4 (5)	3 (4)	0 (0)	8 (10)	5 (6)	57 (74)	77 (100)
20	Länsi-Pohja	3 (5)	0 (0)	0 (0)	2 (3)	21 (34)	35 (57)	61 (100)
21	Lappi	5 (5)	6 (6)	1 (1)	7 (7)	8 (9)	67 (71)	94 (100)
22	Åland	0 (0)	0 (0)	0 (0)	1 (4)	6 (22)	20 (74)	27 (100)
Region South		33 (2)	35 (2)	70 (4)	350 (20)	172 (10)	1120 (63)	1780 (100)
Southwest		30 (3)	38 (4)	16 (2)	128 (14)	114 (13)	574 (64)	900 (100)
West		30 (3)	44 (4)	12 (1)	227 (20)	134 (12)	689 (61)	1136 (100)
East		12 (1)	29 (4)	24 (3)	102 (13)	107 (13)	530 (66)	804 (100)
North		23 (3)	34 (5)	4 (1)	64 (9)	140 (21)	411 (61)	676 (100)
Entire country		128 (2)	180 (3)	126 (2)	871 (16)	667 (13)	3324 (63)	5296 (100)

Table 9 presents the number of KRT patients according to type of treatment in healthcare districts and regions at the end of 2020. The proportion of peritoneal dialysis patients was the greatest in the healthcare district of Lappi, where 41% of all dialysis patients were receiving either continuous ambulatory peritoneal dialysis (CAPD) or automated peritoneal dialysis (APD). The proportion of dialysis patients on home hemodialysis (home HD) was largest, 18%, in the healthcare district of Pohjois-Karjala. Six healthcare districts had no home HD patients.

Of all dialysis patients, 22% were on home dialysis (CAPD, APD, or home HD) at the end of 2020. The pro-

portion of home dialysis was highest (44%) in the healthcare district of Lappi and higher than 30% also in Varsinais-Suomi, Päijät-Häme, Kainuu, and Keski-Pohjanmaa and lower than 10% in three healthcare districts.

Of patients on in-center hemodialysis, 43% were on hemodiafiltration and this proportion varied between 15% and 93% in healthcare districts and between 33% and 69% in regions.

The proportion of kidney transplantation patients varied between 54% and 74% in healthcare districts and between 61% and 66% in regions.

Figure 12. International comparison of prevalence of KRT on 31 December 2019
Finnish Registry for Kidney Diseases 2020

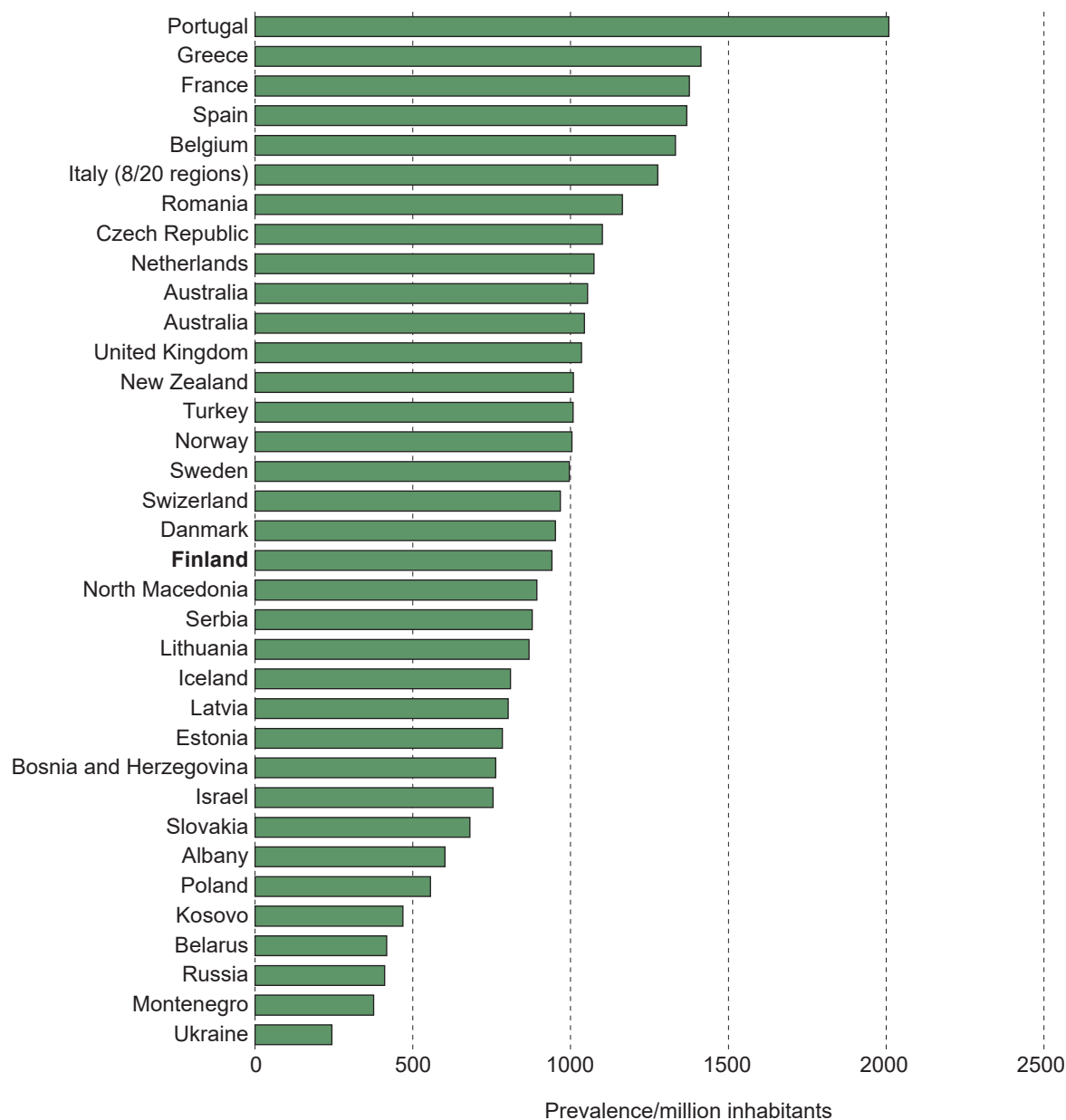


Figure 12 displays the prevalence of KRT on 31 December 2019 in countries reporting to the ERA-EDTA Registry (Annual Report 2019, <http://www.era-online.org/registry/AnnRep2019.pdf>) and in Australia and New Zealand (ANZ-DATA 43rd Annual Report 2020, www.anzdata.org.au). The prevalence rates in the Nordic countries were similar. Relative to Finland, the prevalence in Denmark was 1% higher, in Sweden 6% higher, in Norway 7% higher, and in Iceland 14% lower. In Portugal the prevalence was more than two-fold.

Table 10. Number of patient-years of all KRT patients according to diagnosis and type of treatment
Finnish Registry for Kidney Diseases 2010–2020

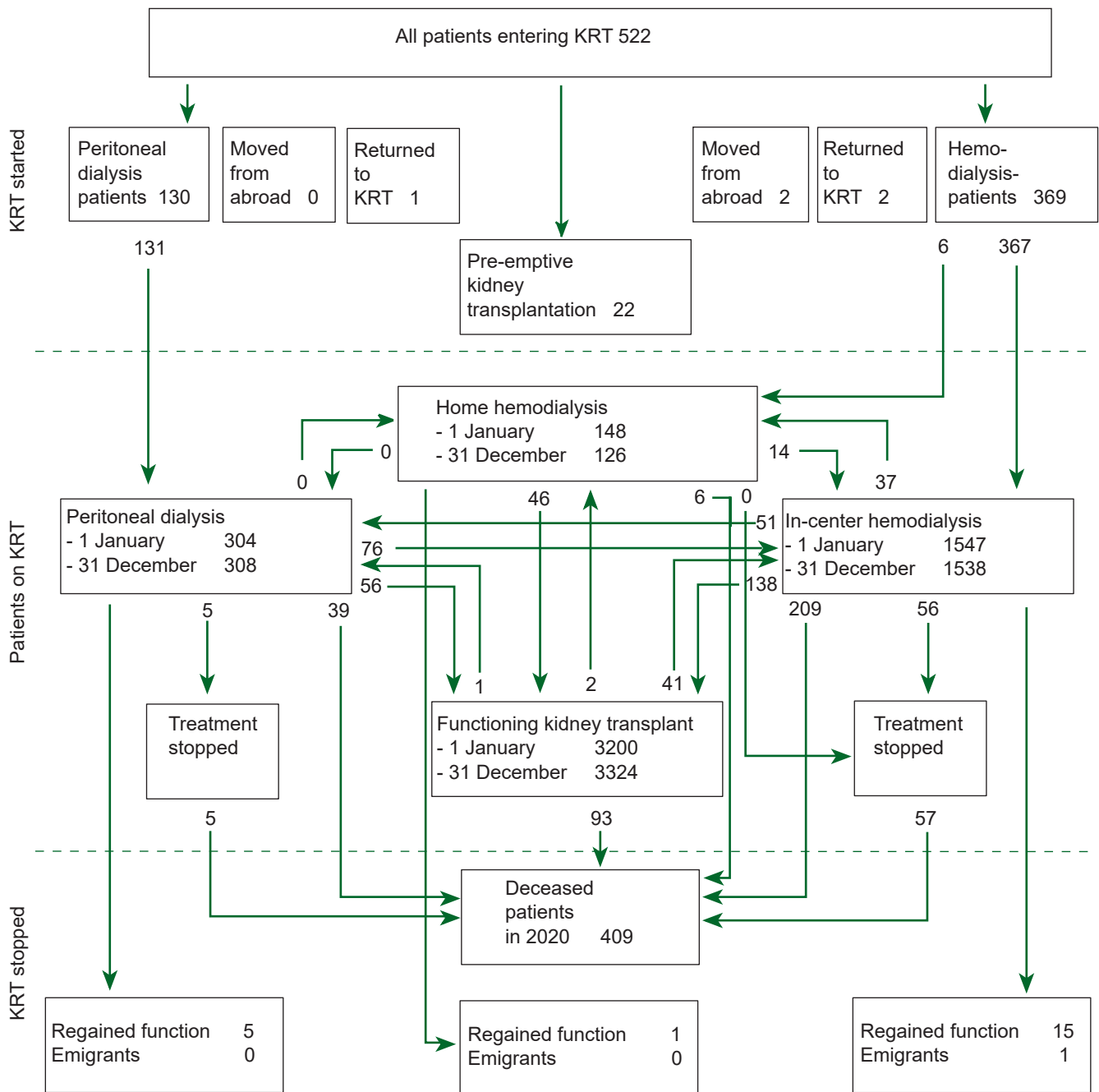
Diagnosis	Number of patient-years in 2010(%)				Number of patient-years in 2020 (%)			
	Peritoneal dialysis	Hemo-dialysis	Trans-plantation	Total	Peritoneal dialysis	Hemo-dialysis	Trans-plantation	Total
Glomerulonephritis	68 (19.2)	211 (15.2)	666 (26.9)	945 (22.4)	53 (17)	256 (15.2)	841 (25.8)	1149 (21.9)
Type 1 diabetes	89 (25.3)	145 (10.4)	467 (18.8)	701 (16.6)	56 (18.1)	221 (13.2)	554 (17)	831 (15.8)
Polycystic degeneration	21 (6.1)	124 (8.9)	415 (16.7)	560 (13.3)	20 (6.5)	170 (10.1)	590 (18.1)	780 (14.9)
Undefined kidney disease	44 (12.5)	241 (17.3)	104 (4.2)	389 (9.2)	40 (13)	231 (13.8)	223 (6.8)	494 (9.4)
Type 2 diabetes	54 (15.4)	276 (19.9)	64 (2.6)	394 (9.3)	44 (14.3)	328 (19.6)	105 (3.2)	477 (9.1)
Tubulointerstitial nephritis	21 (6.1)	83 (6)	59 (2.4)	164 (3.9)	35 (11.3)	117 (7)	98 (3)	250 (4.8)
Nephrosclerosis	7 (1.9)	54 (3.9)	199 (8)	260 (6.2)	10 (3.1)	40 (2.4)	173 (5.3)	222 (4.2)
Urinary tract obstruction	8 (2.2)	48 (3.4)	94 (3.8)	150 (3.6)	11 (3.7)	63 (3.8)	144 (4.4)	219 (4.2)
Other systemic diseases	8 (2.3)	35 (2.5)	65 (2.6)	109 (2.6)	16 (5)	95 (5.7)	104 (3.2)	214 (4.1)
Other kidney diseases	12 (3.5)	62 (4.4)	91 (3.7)	165 (3.9)	13 (4.1)	60 (3.6)	127 (3.9)	200 (3.8)
Congenital diseases	5 (1.3)	18 (1.3)	106 (4.3)	129 (3.1)	6 (1.8)	19 (1.1)	145 (4.4)	169 (3.2)
Congenital nephrosis. Finnish type	2 (0.6)	6 (0.4)	69 (2.8)	77 (1.8)	2 (0.6)	7 (0.4)	99 (3)	108 (2.1)
Amyloidosis	2 (0.6)	33 (2.4)	10 (0.4)	45 (1.1)	3 (0.8)	38 (2.3)	12 (0.4)	53 (1)
Malignancies	6 (1.8)	42 (3)	37 (1.5)	85 (2)	1 (0.2)	18 (1.1)	24 (0.7)	42 (0.8)
Pyelonephritis	3 (0.9)	6 (0.5)	12 (0.5)	22 (0.5)	1 (0.3)	8 (0.5)	11 (0.3)	20 (0.4)
Metabolic diseases	1 (0.2)	6 (0.4)	21 (0.8)	28 (0.7)	0 (0)	7 (0.4)	12 (0.4)	19 (0.4)
Total	351 (100)	1390 (100)	2479 (100)	4221 (100)	310 (100)	1676 (100)	3262 (100)	5248 (100)

Table 10 presents the number of patient-years according to diagnosis of kidney disease and type of treatment in 2010 and 2020. The number of patient-years indicates time spent by patients in KRT during the year. Overall, the number of patient-years has increased by 24% since 2010. The number of patient-years has increased by 21% in hemodialysis and by 32% in kidney transplantation, and decreased by 12% in peritoneal dialysis.

Glomerulonephritis is the most common diagnosis among all KRT patients and among kidney transplantation patients; the proportion of patient-years due to glomerulonephritis was 22% in 2020. Type 1 diabetes is the second most com-

mon diagnosis among all KRT patients and the most common diagnosis among peritoneal dialysis patients. Type 2 diabetes is the most common kidney disease diagnosis of hemodialysis patients, and the number of patient-years among kidney transplantation patients with type 2 diabetes has increased by 64% within the last ten years. The number of patient-years of all KRT patients with nephrosclerosis, urinary tract obstruction, other kidney diseases, and congenital nephrosis has increased over 40% during the last ten years. The number of patient-years of all KRT patients with amyloidosis and pyelonephritis has decreased over 30% during the last ten years.

Figure 13. Net changes in type of treatment
Finnish Registry for Kidney Diseases 2020



During 2020 altogether 522 new patients entered KRT (Figure 13) and four patients returned to KRT. In all, 5199 patients were receiving KRT at the beginning of the year and 5296 patients at the end of the year. Altogether 409 patients died, and dialysis was discontinued for 20 patients because the patient's own kidney function resumed. Of those who died, 93 had a functioning kidney transplant, 39 were receiving peritoneal dialysis, 6 were on home hemodialysis, and 209 were on in-center hemodialysis. During 2020 KRT was discontinued for 61 uremic patients. At the end of 2020, the number of home hemodialysis patients was 15% smaller and the number of kidney transplantation patients

4% larger than at the beginning of the year. The number of in-center hemodialysis patients and peritoneal dialysis patients remained stable during year 2020.

A total of 263 patients received a kidney transplant which is at the same level than in the previous years. Of these patients, 25 received a combined pancreas and kidney transplantation, one received a combined liver and kidney transplantation, and one received a combined heart and kidney transplantation (source: Kidney Transplantation Unit, Helsinki University Central Hospital). Thirty-one kidney transplants were received from living donors, of which 13 were from relatives and three were ABO-incompatible.

Table 11. Mortality of KRT patients by region
Finnish Registry for Kidney Diseases 2010–2020

Region	Deaths/1000 patient-years						Deaths/1000 patient-years ¹⁾					
	2010	2015	2018	2019	2020	2016–2020	2010	2015	2018	2019	2020	2016–2020
South	69	78	82	79	66	76	68	77	80	76	66	75
Southwest	73	92	84	82	92	85	71	89	83	82	91	84
West	100	102	85	74	74	79	94	100	85	71	74	77
East	97	74	87	97	79	85	94	72	82	95	79	83
North	88	107	90	104	96	89	88	100	90	103	93	88
Entire country	83	88	85	84	78	81	81	86	83	82	77	80

¹⁾Patients who died within 90 days of start of KRT excluded

Figure 14. Standardized mortality of KRT patients by region
Finnish Registry for Kidney Diseases 2010–2020

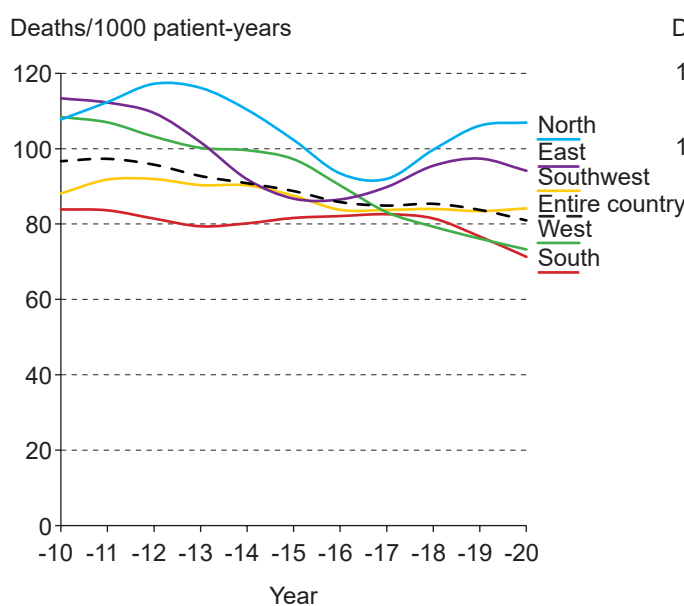


Figure 15. Standardized mortality of KRT patients by region (patients who died within 90 days of start of KRT excluded)
Finnish Registry for Kidney Diseases 2010–2020

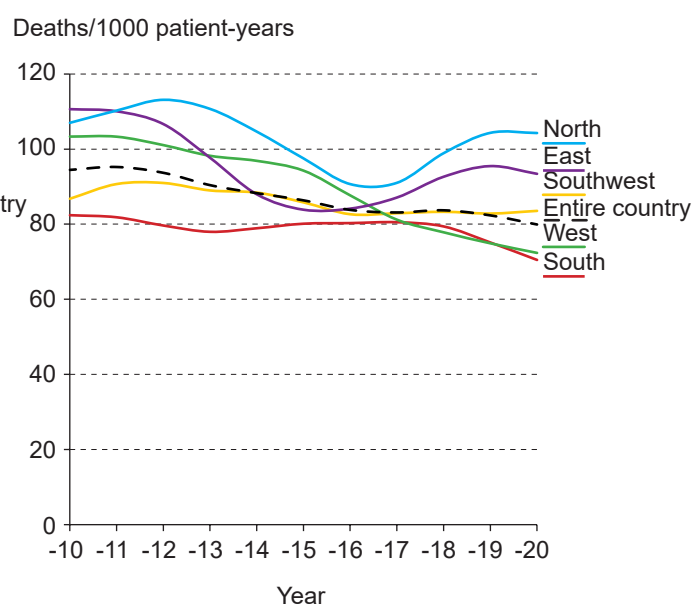


Table 11 shows KRT patients' mortality in 2010–2020 according to region. The mortality of patients who had been on KRT for at least 90 days is presented separately. The average mortality in 2016–2020 was lower in the southern and western region than elsewhere.

Figures 14 and 15 show regional mortality as smoothed averages. The regional mortality rates for 2010–2020 have

been age- and sex-standardized using all patient-years in 2020 as the reference. Changes in age and sex distribution during this ten-year period have been taken into consideration. Patients who died within 90 days of start of KRT were excluded from Figure 15. During 2010–2020 the standardized mortality rate has declined.

Table 12. Number of KRT patients older than 20 years in hospitals
Finnish Registry for Kidney Diseases 2020

Region	Healthcare district	Hospital	KRT patients (≥20 y) on 31/12/2020			
			PD	HD	Tx	Total
South (R1)			88	655	1203	1946
	Helsinki-Uusimaa (1)		60	479	909	1448
		Helsinki University Central Hospital	60	353	764	1177
		Nephrology Polyclinic			764	764
		Dialysis unit DHK		74		74
		Dialysis unit DOK	60	88		148
		B. Braun Malmi		102		102
		B. Braun Pitäjänmäki		89		89
		Hyvinkää Hospital		45	47	92
		Lohja Hospital		31	43	74
		Länsi-Uusimaa Hospital		25	20	45
	Porvoo Hospital		25	35	60	
	Päijät-Häme (7)		20	65	127	212
		Päijät-Häme Central Hospital	20	65	127	212
	Kymenlaakso (8)		8	55	70	133
		Kymenlaakso Central Hospital	8	55	70	133
	Etelä-Karjala (9)		56	97	153	
		South Karelia Central Hospital	38	97	135	135
		Honkajarju Hospital	18		18	18
Southwest (R2)			67	259	547	873
	Varsinais-Suomi (3)		44	137	278	459
		Turku University Central Hospital	44	137	278	459
	Satakunta (4)		14	57	158	229
		Satakunta Central Hospital	14	57	158	229
	Vaasa (16)		9	58	91	158
		Vaasa Central Hospital	9	44	90	143
		Pietarsaari Hospital		14	1	15
	Åland (22)		7		20	27
		Åland Central Hospital		7	20	27
West (R3)			55	312	537	904
	Kanta-Häme (5)		14	60	115	189
		Central Hospital of Tavastia	14	60	115	189
	Pirkanmaa (6)		36	180	337	553
		Tampere University Hospital	36	180	337	553
	Etelä-Pohjanmaa (15)		5	72	85	162
		Southern Ostrobothnia Central Hospital	5	72	85	162
East (R4)			40	230	517	787
	Etelä-Savo (10)		3	30	56	89
		Mikkeli Central Hospital	3	30	56	89
	Itä-Savo (11)		1	13	35	49
		Central Hospital of Savonlinna	1	13	35	49
	Pohjois-Karjala (12)		7	49	98	154
		North Karelia Central Hospital	7	49	98	154
	Pohjois-Savo (13)		15	77	188	280
		Kuopio University Hospital	15	52	164	231
		Regional Hospital of Iisalmi		11	16	27
	Keski-Suomi (14)		14	61	140	215
		Central Finland Central Hospital	14	61	140	215
North (R5)			57	204	398	659
	Keski-Pohjanmaa (17)		13	30	47	90
		Central Hospital of Keski-Pohjanmaa	13	30	47	90
	Pohjois-Pohjanmaa (18)		23	124	193	340
		Oulu University Hospital	23	124	193	340
	Kainuu (19)		7	11	58	76
		Kainuu Central Hospital	7	11	58	76
	Länsi-Pohja (20)		3	22	34	59
		Central Hospital of Länsi-Pohja	3	22	34	59
	Lappi (21)		11	17	66	94
		Lapland Central Hospital	11	17	66	94
Entire country			307	1660	3202	5169

At the end of 2020, dialysis and kidney transplantation patients were treated and followed up in 29 hospitals of 21 healthcare districts in five regions (Table 12). In the first part of this report, the healthcare district of the patient is determined according to place of residence. However, in the analysis of treatment quality on pages 30–44, healthcare district of the patient is determined according to treating unit. In the entire country, 98% of patients lived in the same

healthcare district in which they were treated.

Päijät-Häme healthcare district changed in 2018 to southern region and is shown accordingly in Table 12. However, this change was not taken into account in the register's database, so in the other tables and figures Päijät-Häme healthcare district is still included in the results of western region in this report.

Figure 16. Hemoglobin distribution of dialysis patients older than 20 years at end of year
Finnish Registry for Kidney Diseases 2010–2020

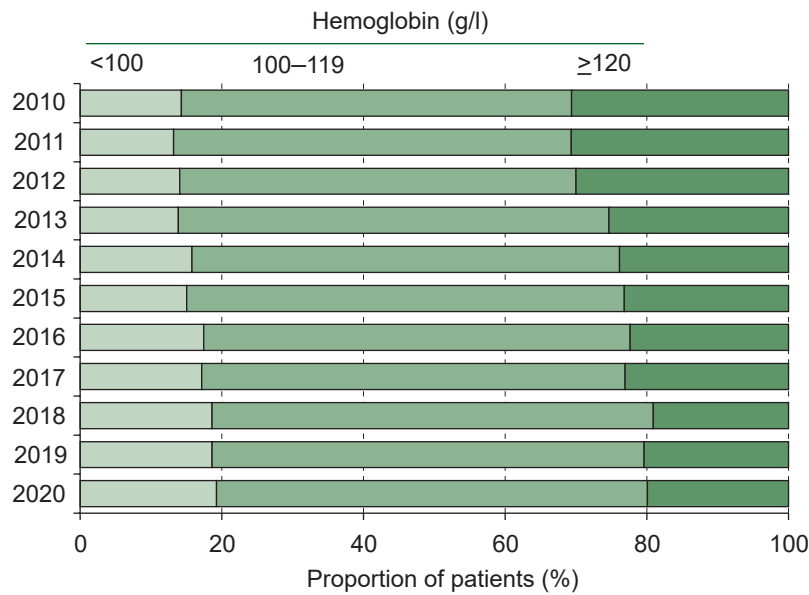
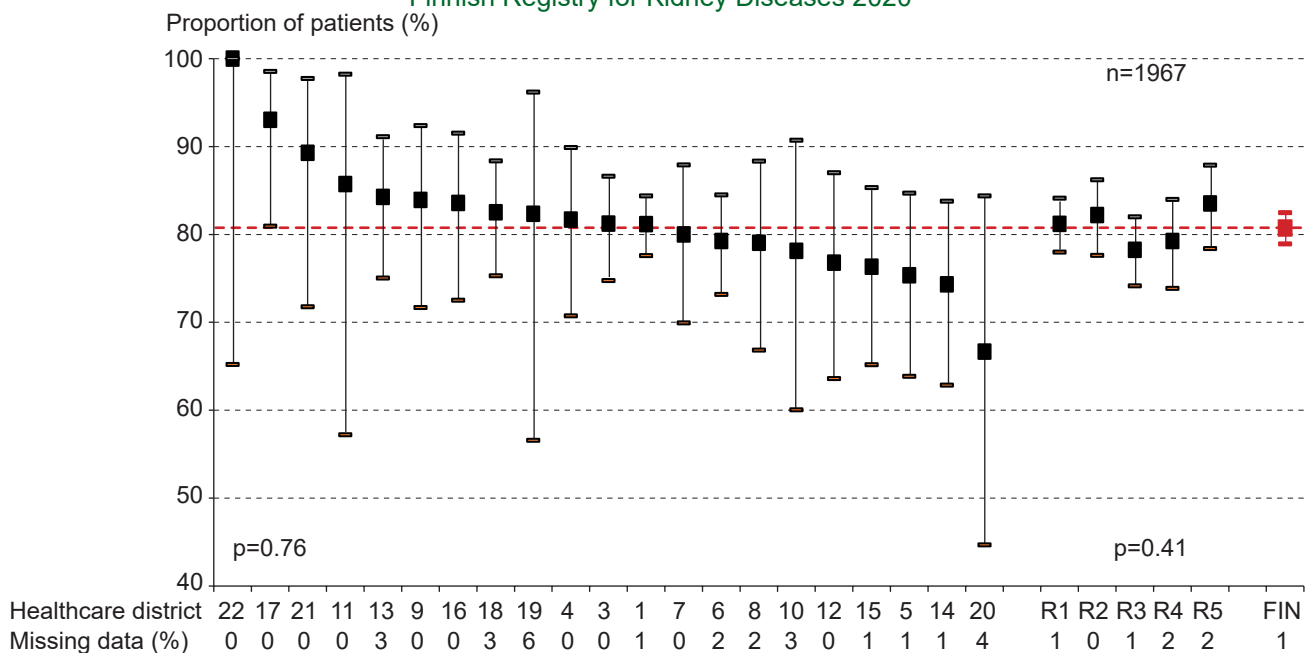


Figure 17. Proportion of dialysis patients older than 20 years with hemoglobin concentration ≥ 100 g/l in healthcare districts and regions
Finnish Registry for Kidney Diseases 2020



Several guidelines exist regarding the target for blood hemoglobin concentration in dialysis patients: European Best Practice Guidelines (EBPG) and the guidelines of the Kidney Disease Outcome Quality Initiative (KDOQI) and the Kidney Disease Global Outcomes (KDIGO). KDIGO published new guidelines on renal anemia in 2012, according to which erythropoiesis-stimulating agents (ESAs) should be used to keep dialysis patients' hemoglobin in the range of 100–115 g/l.

The renal registries in the UK and Sweden have in their reports used target hemoglobin levels of either 100–120 g/l or ≥ 100 g/l. For sake of comparison, we have chosen these same cut-offs.

The distribution of dialysis patients' hemoglobin concentration has changed during 2010–2020 (Figure 16). The

proportion of patients with a hemoglobin concentration <100 g/l has increased from 14% to 19%, while the proportion of patients with a hemoglobin concentration ≥ 120 g/l has decreased from 31% to 20%. Figures 16 and 17 include all hemodialysis patients, also those who did not use ESAs. In 2020, hemoglobin concentration was <100 g/l in 21% and >120 g/l in 15% of the patients using ESAs.

In Figure 17, the hemoglobin target is ≥ 100 g/l. At the end of 2020, the proportion of dialysis patients reaching this target was 81%, varying from 67% to 100% in the healthcare districts ($p=0.76$) and from 78% to 84% in the regions ($p=0.41$). No significant difference was present in the proportions of men and women with a hemoglobin concentration ≥ 100 g/l.

Figure 18. Distribution of serum phosphate among dialysis patients older than 20 years at end of year Finnish Registry for Kidney Diseases 2010–2020

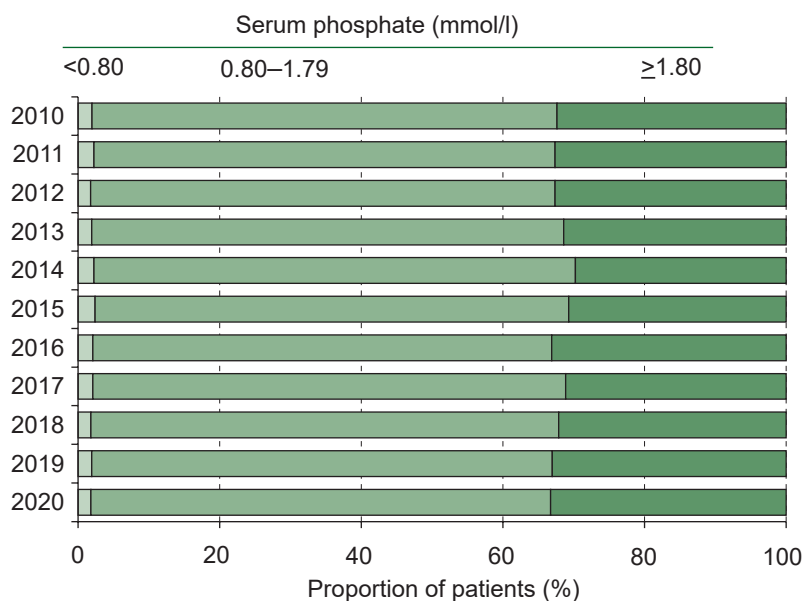
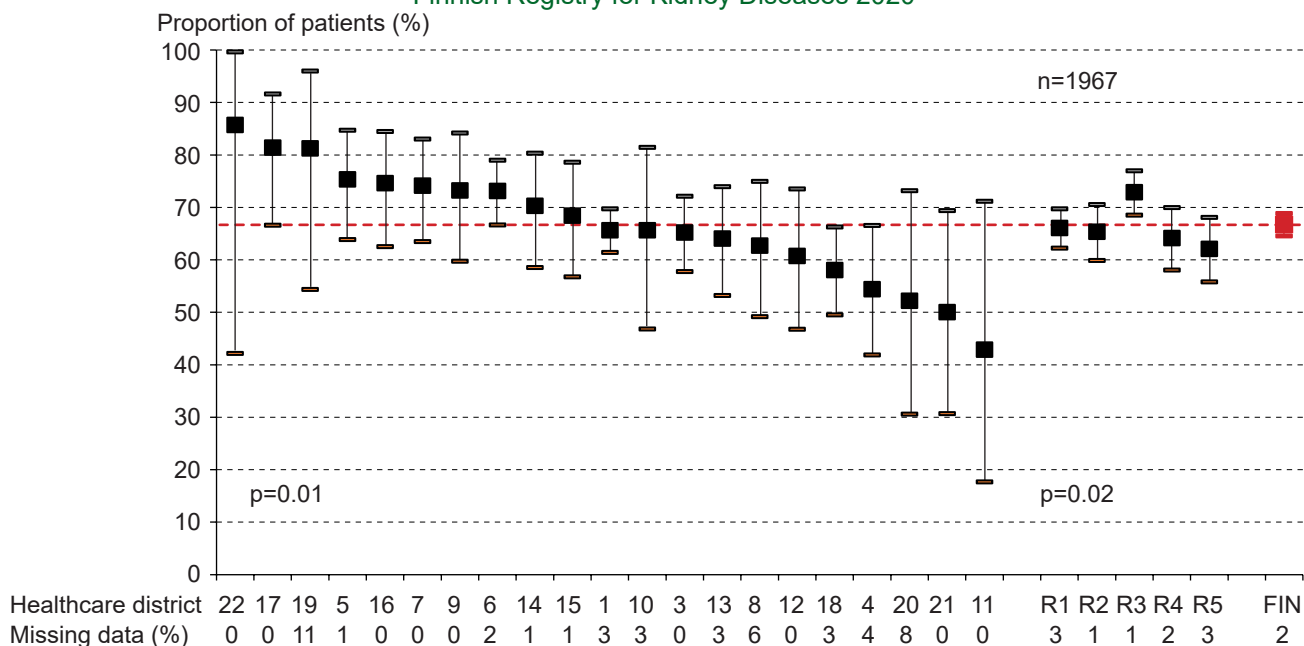


Figure 19. Proportion of dialysis patients older than 20 years with serum phosphate <1.8 mmol/l in healthcare districts and regions Finnish Registry for Kidney Diseases 2020



Hyperphosphatemia among patients with kidney disease is associated with vascular calcification and increased mortality. The guideline of the Kidney Disease Global Outcomes (KDIGO) suggests that elevated serum phosphate of dialysis patients should be lowered towards the normal range with diet, intensified dialysis treatment, and phosphate binders if needed.

At the end of 2020, 67% of hemodialysis and peritoneal dialysis patients had concentrations of serum phosphate <1.8 mmol/l; this proportion has remained virtually un-

changed in the last decade (Figure 18). Only 2% of dialysis patients had an excessively low concentration of serum phosphate (<0.8 mmol/l).

The proportion of patients with serum phosphate <1.8 mmol/l varied between 43% and 86% in the healthcare districts (p=0.01) and between 62% and 73% in the regions (p=0.02) (Figure 19). No significant difference was present in the proportions of men and women with a phosphate concentration <1.8 mmol/l.

Figure 20. Distribution of serum parathyroid hormone (PTH) among dialysis patients older than 20 years Finnish Registry for Kidney Diseases 2010–2020

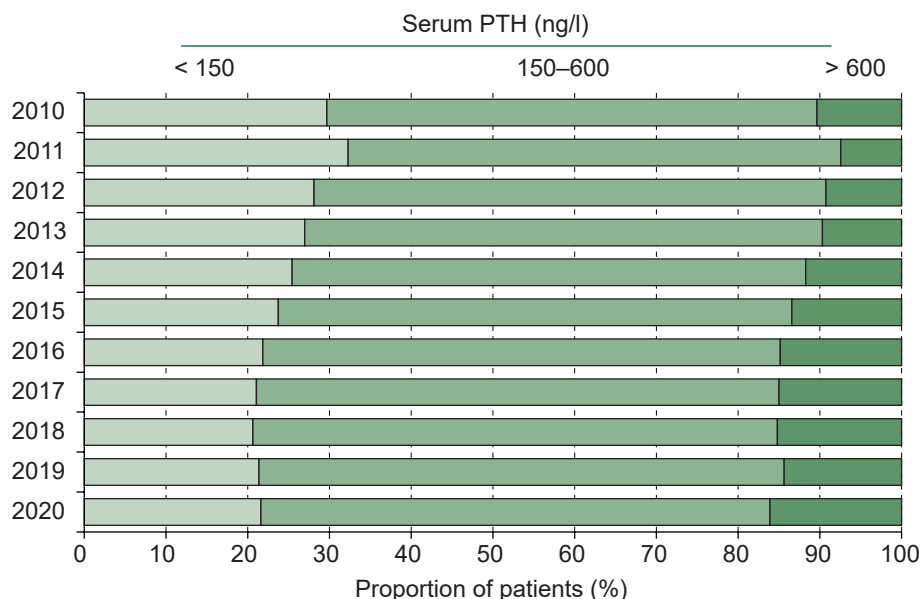
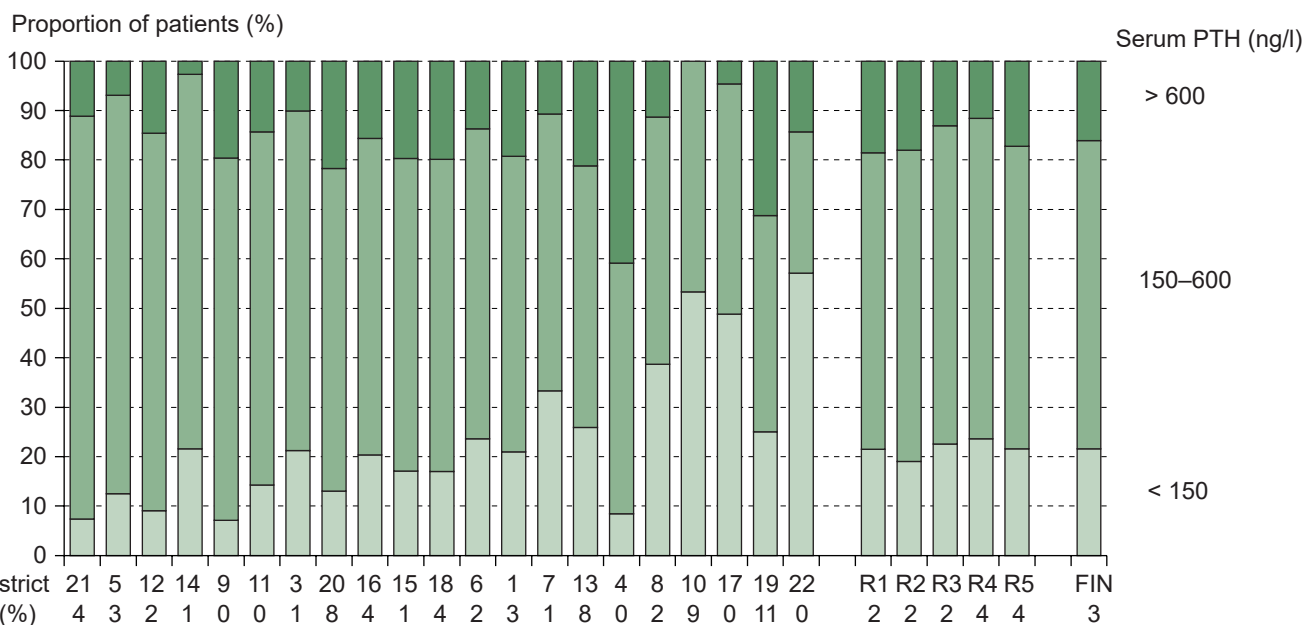


Figure 21. Distribution of serum PTH among dialysis patients older than 20 years in healthcare districts Finnish Registry for Kidney Diseases 2020



Chronic kidney disease is associated with a disorder known as chronic kidney disease – mineral and bone disorder (CKD-MBD), which may lead to calcifications in blood vessels and soft tissue and to bone changes. Bone turnover may be high (with serum PTH typically above the target level) or low (with serum PTH usually below the target level) or normal. KDIGO has earlier suggested that dialysis patients' target serum PTH be 2 to 9 times the higher reference limit of healthy persons. However, in the 2017 update of the KDIGO guidelines, exact target levels are not mentioned.

There are several measurement methods of PTH available, hampering comparison of healthcare districts and

regions. This report uses the PTH target of 150–600 ng/l.

At the end of 2020, 22% of dialysis patients had a PTH concentration lower than 150 ng/l and 16% had a concentration higher than 600 ng/l. Dialysis patients' level of serum PTH has increased in the beginning of 2010s but has leveled since that (Figure 20).

At the end of 2020, 62% of dialysis patients achieved the PTH target of 150–600 ng/l, with the proportion varying from 29% to 81% in healthcare districts ($p < 0.01$) and from 60% to 65% in regions ($p = 0.53$) (Figure 21). No significant-difference was present in the proportions of men and women reaching the PTH target.

Figure 22. Estimated GFR of new KRT patients older than 20 years
Finnish Registry for Kidney Diseases 2010–2020

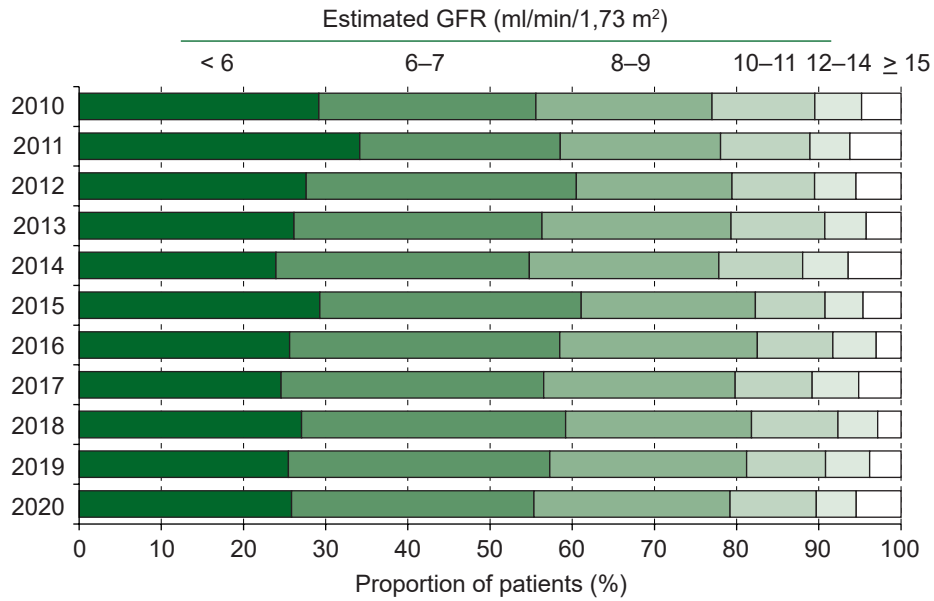


Figure 23. Estimated GFR of new KRT patients older than 20 years in healthcare districts
Finnish Registry for Kidney Diseases 2016–2020

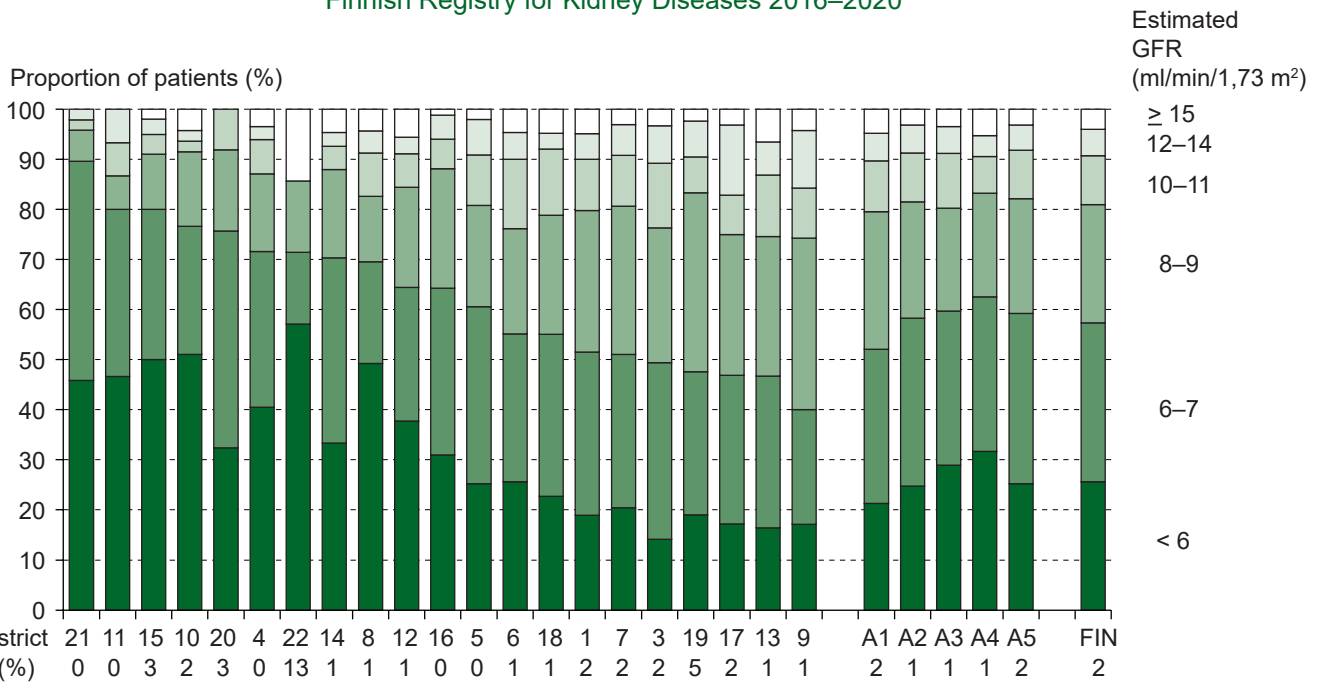


Figure 22 shows the estimated glomerular filtration rate (GFR), calculated with the CKD-EPI formula, of patients who entered KRT in 2010–2020. The estimated GFR is based on serum creatinine concentration measured before first KRT. The decision to start KRT is not based on estimated GFR alone; the patient's symptoms and clinical condition also affect the decision. Research on timing of KRT start has not supported a very early start (at high estimated GFR).

In 2010, the median estimated GFR was 7.4 ml/min/1.73

m² and in 2020 it was 7.7 ml/min/1.73 m².

Figure 23 presents estimated GFR of patients who entered KRT in 2016–2020 according to healthcare district and region. The healthcare districts are sorted based on the proportion of patients with an estimated GFR <8 ml/min/1.73 m². This proportion for the entire country was 57% but varied by healthcare districts in the range of 40–90% (p<0.001) and by region in the range of 52–63% (p<0.001). Estimated GFR was <8 ml/min/1.73 m² in women more often than in men (p<0.001).

Figure 24. Estimated GFR of kidney transplantation patients older than 20 years
Finnish Registry for Kidney Diseases 2010–2020

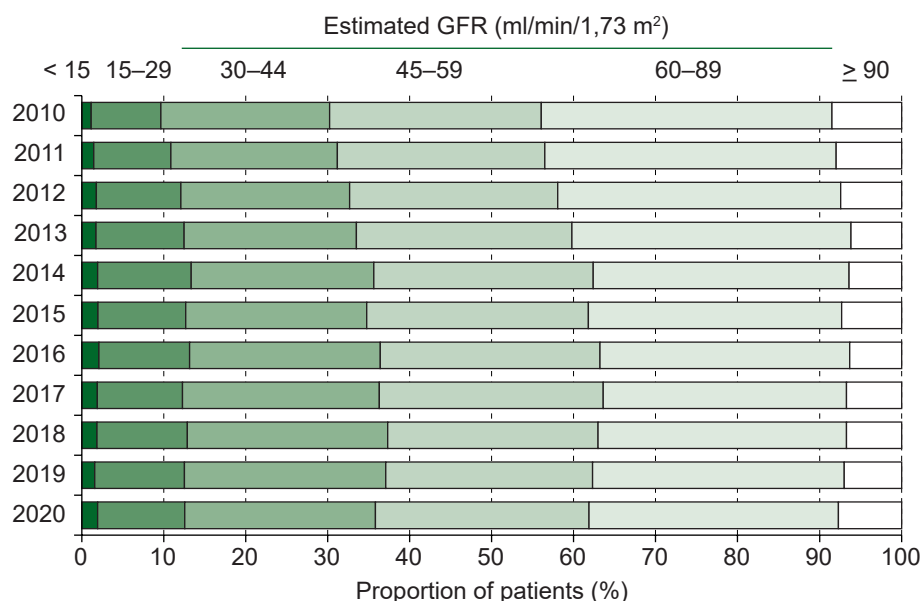


Figure 25. Estimated GFR of kidney transplantation patients older than 20 years in healthcare districts
Finnish Registry for Kidney Diseases 2020

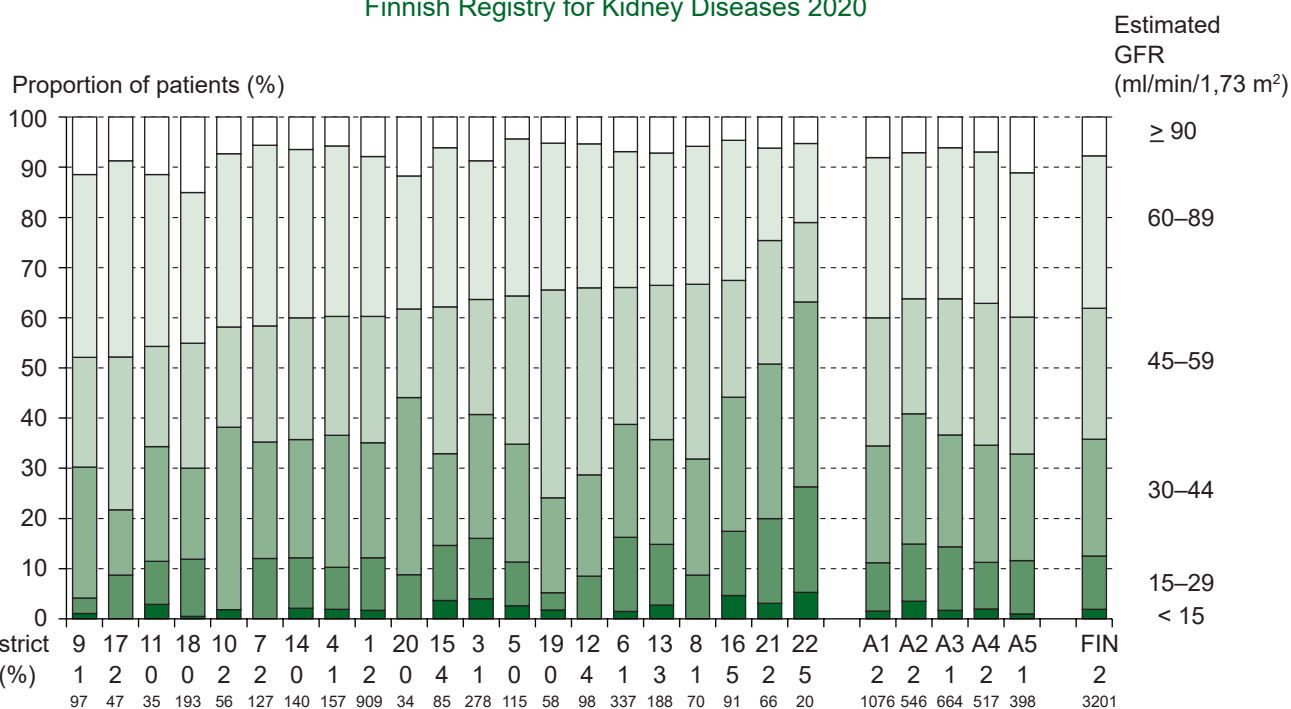


Figure 24 shows the distribution of the estimated glomerular filtration rate (GFR) of kidney transplant patients between 2010 and 2020, calculated using the CKD-EPI formula at the end of the year. In 2010, the estimated GFR was <60 ml/min/1.73 m² of patients in 56% and in 2020 in 62% of patients. However, the situation has been stable in recent years.

Figure 25 presents the estimated GFR of kidney transplant patients at the end of 2020 by healthcare district

and region. The healthcare districts are sorted according to the proportion of patients with an estimated GFR <60 ml/min/1.73 m². This proportion was 62% in the entire country, varying from 52% to 79% in healthcare districts ($p=0.16$) and from 60% to 64% in regions ($p=0.51$). In elderly patients, the estimated GFR was more likely to be <60 ml/min/1.73 m² ($p<0.001$), but gender was not significantly associated with estimated GFR level.

Figure 26. Propability of kidney transplantation patients over 20 years living with a functioning transplant by transplantation period
Finnish Registry for Kidney Diseases 2000–2020

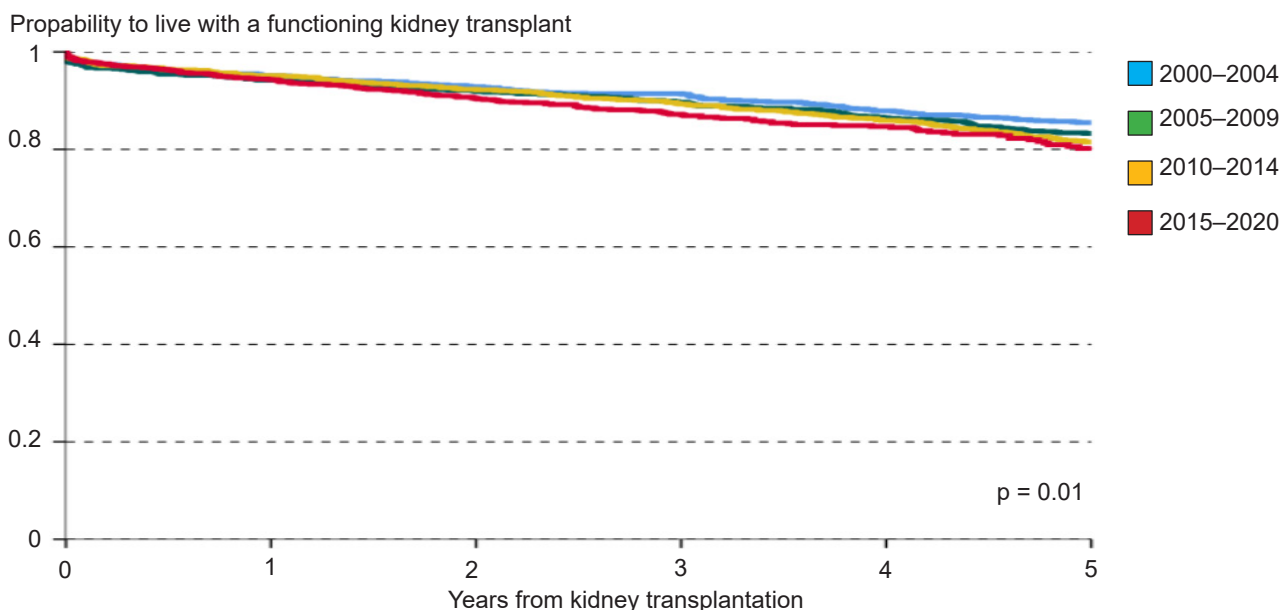
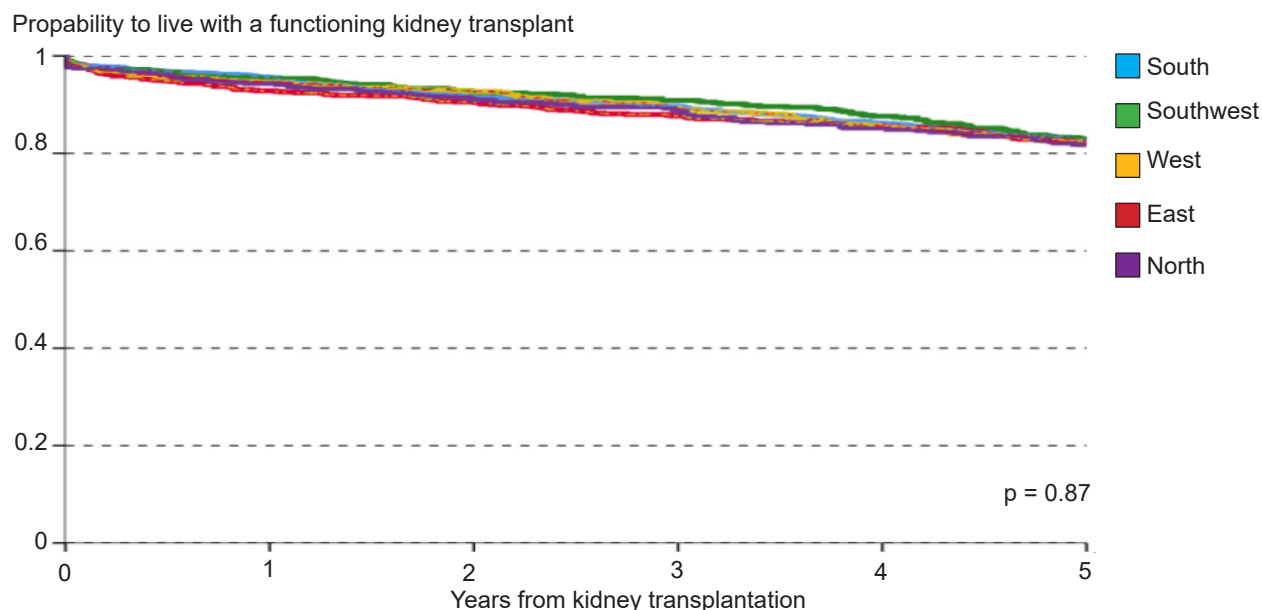


Figure 27. Propability of kidney transplantation patients over 20 years living with a functioning transplant by region
Finnish Registry for Kidney Diseases 2000–2020



Figures 26 and 27 show the probability of kidney transplant patients over 20 years of age living with a functioning transplant between 2000 and 2020. Follow-up ceased if dialysis treatment resumed, the patient died, or at the latest on 31 December 2020.

Figure 26 compares the patients who received a kidney transplant at different time periods. Five years after kidney transplantation, the proportion of patients living with a functioning transplant significantly decreased from 86% to 80%, when comparing those who received a transplant in 2000–2004 and 2015–2020. When adjusted for age, sex, and kidney disease, the difference remained significant. The

reason for this change is probably explained by the expanded criteria for transplant recipients and donors, which has enabled an increase in the number of kidney transplants in this millennium and at the same time contributed to an improvement in the survival probability of all KRT patients (Report 2018).

Figure 27 compares kidney transplant recipients by region between 2000 and 2020. Probability to live with a functioning transplant after five years from transplantation was 82–83% in all regions, and no significant difference emerged after adjustment for age, gender, and kidney disease.

Figure 28. Vascular access of new hemodialysis patients older than 20 years at end of year
Finnish Registry for Kidney Diseases 2014–2020

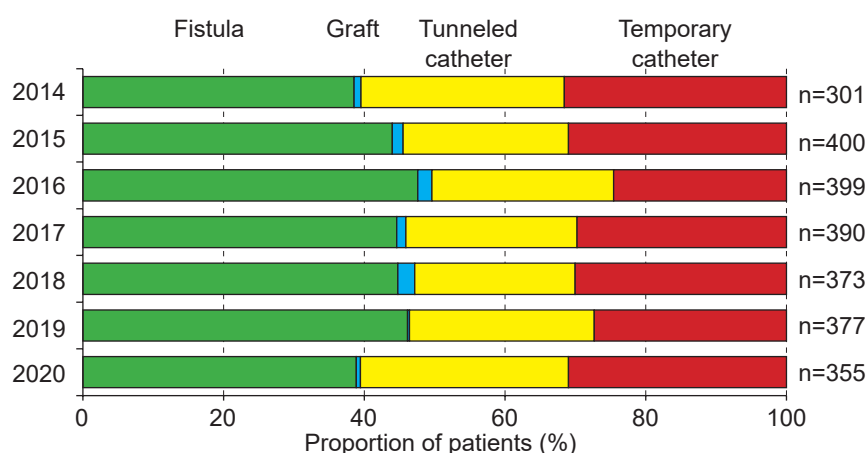
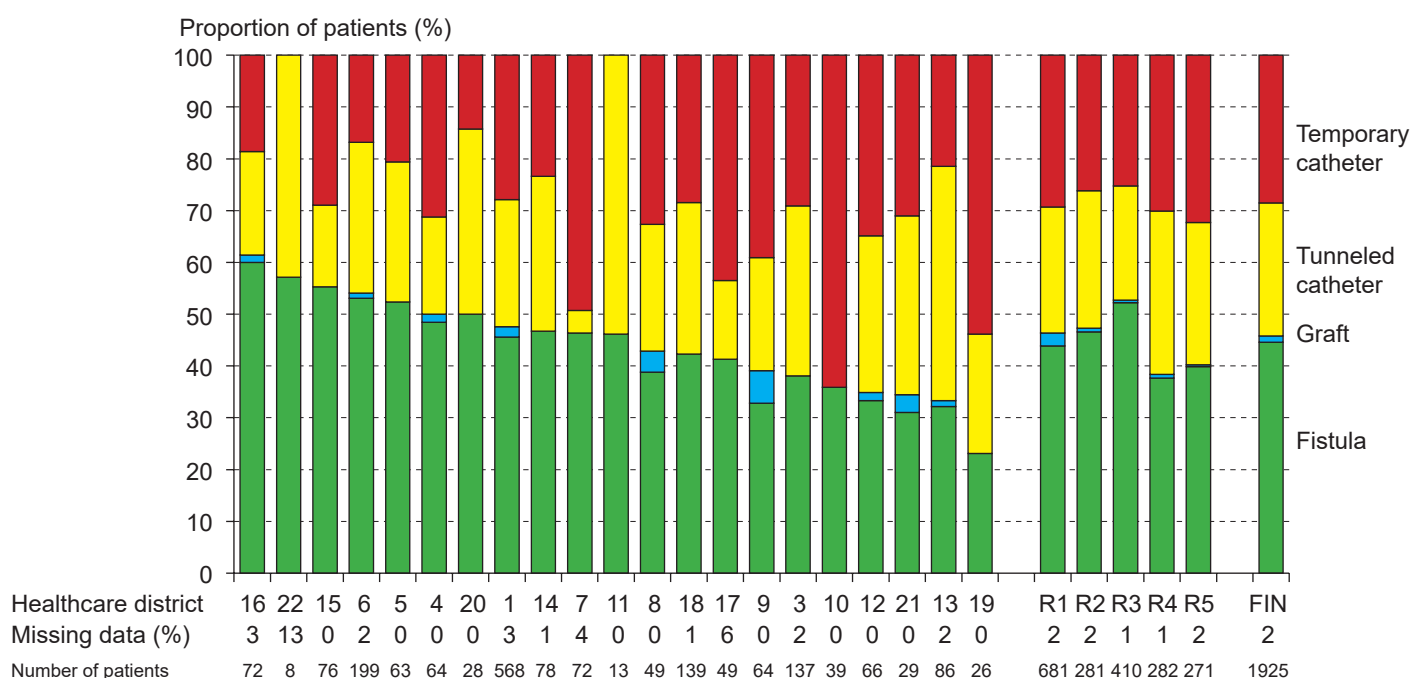


Figure 29. Vascular access of new hemodialysis patients older than 20 years in healthcare districts
Finnish Registry for Kidney Diseases 2016–2020



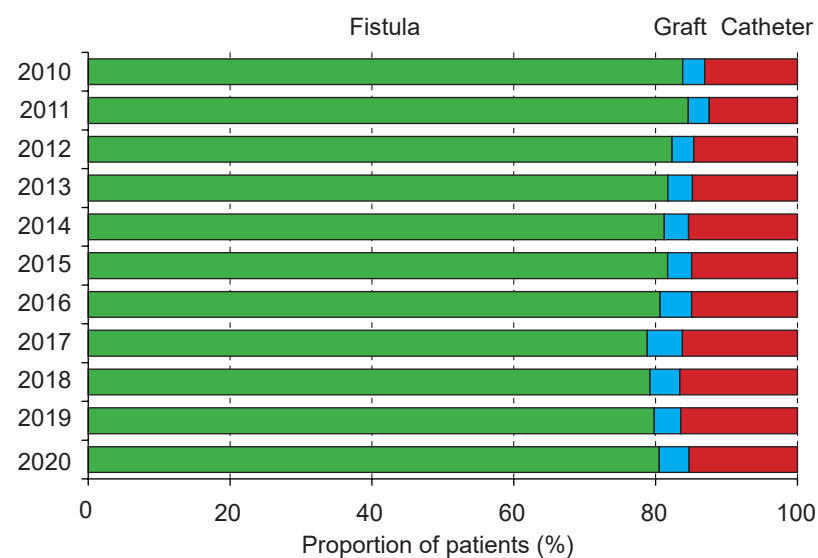
The Finnish Registry for Kidney Diseases has since 2014 collected data on vascular access of patients entering hemodialysis as the first type of KRT. The recommended type of vascular access is an arteriovenous fistula or graft. A tunneled central venous catheter is a better alternative than a temporary (non-cuffed) central venous catheter, which is recommended only when dialysis is started acutely and other types of vascular access are not possible.

In 2020, 39% of patients older than 20 years who entered hemodialysis had an arteriovenous fistula or graft, and the

proportion decreased from the previous years (Figure 28). Of new hemodialysis patients in 2020, 31% started with a temporary catheter.

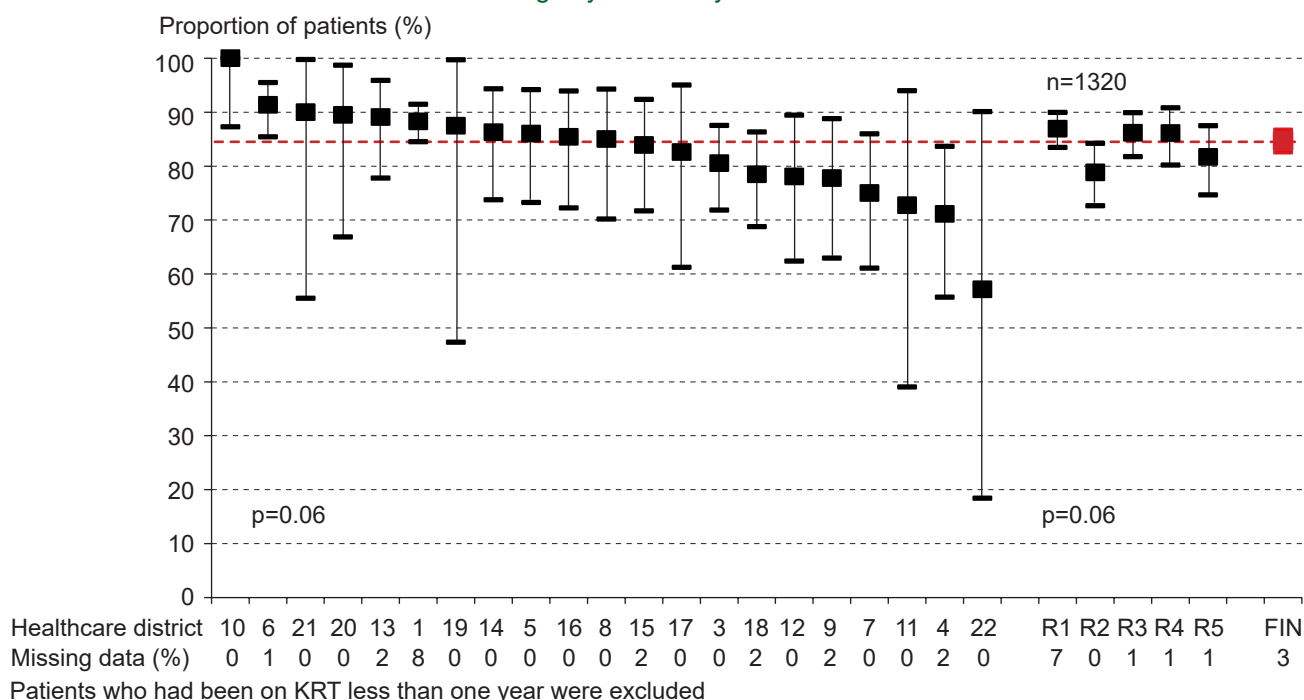
Figure 29 presents the distribution of types of first vascular access among patients who entered hemodialysis in 2016–2020. In the entire country, 46% of patients had a fistula or graft, but the proportion varied between 23% and 61% in healthcare districts ($p=0.007$) and between 38% and 53% in regions ($p<0.001$). The proportion of patients with a fistula or graft did not differ between the sexes.

Figure 30. Vascular access of hemodialysis patients older than 20 years at end of year
Finnish Registry for Kidney Diseases 2010–2020



Patients who had been on KRT less than one year were excluded

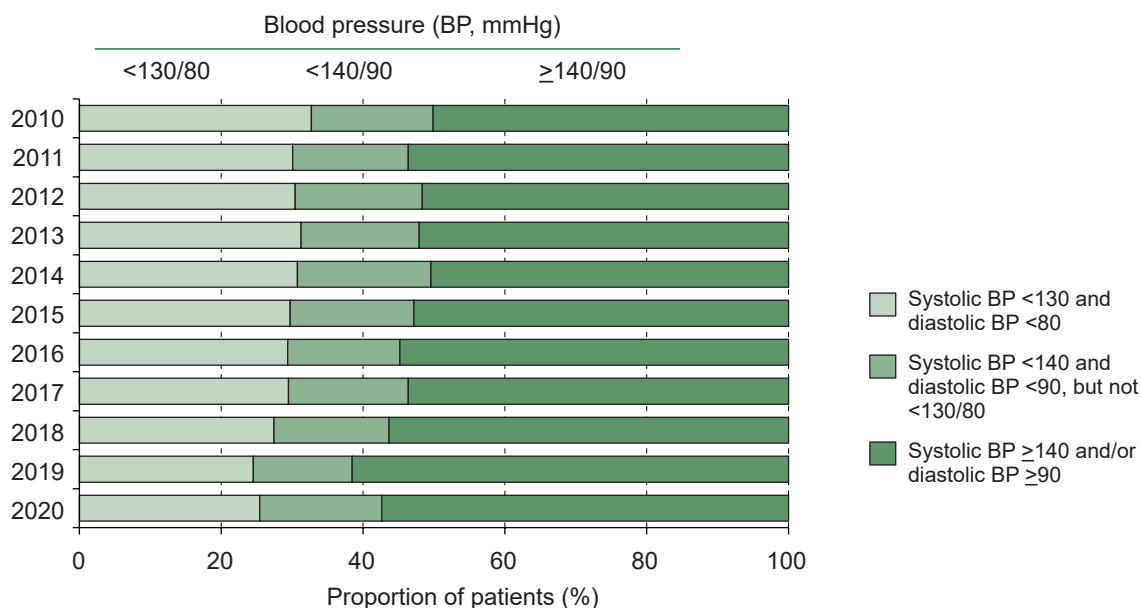
Figure 31. Proportion of hemodialysis patients older than 20 years with a fistula or graft
in healthcare districts and regions
Finnish Registry for Kidney Diseases 2020



Vascular access is one of the most important quality measures of hemodialysis. Use of a central venous catheter is associated with complications, and the goal is that hemodialysis patients have an arteriovenous fistula or graft. Of hemodialysis patients aged 20 years or older who had been on KRT for at least one year, the proportion with a fistula or graft had decreased from 87% in 2010 to 85% in 2020 (Figure 30).

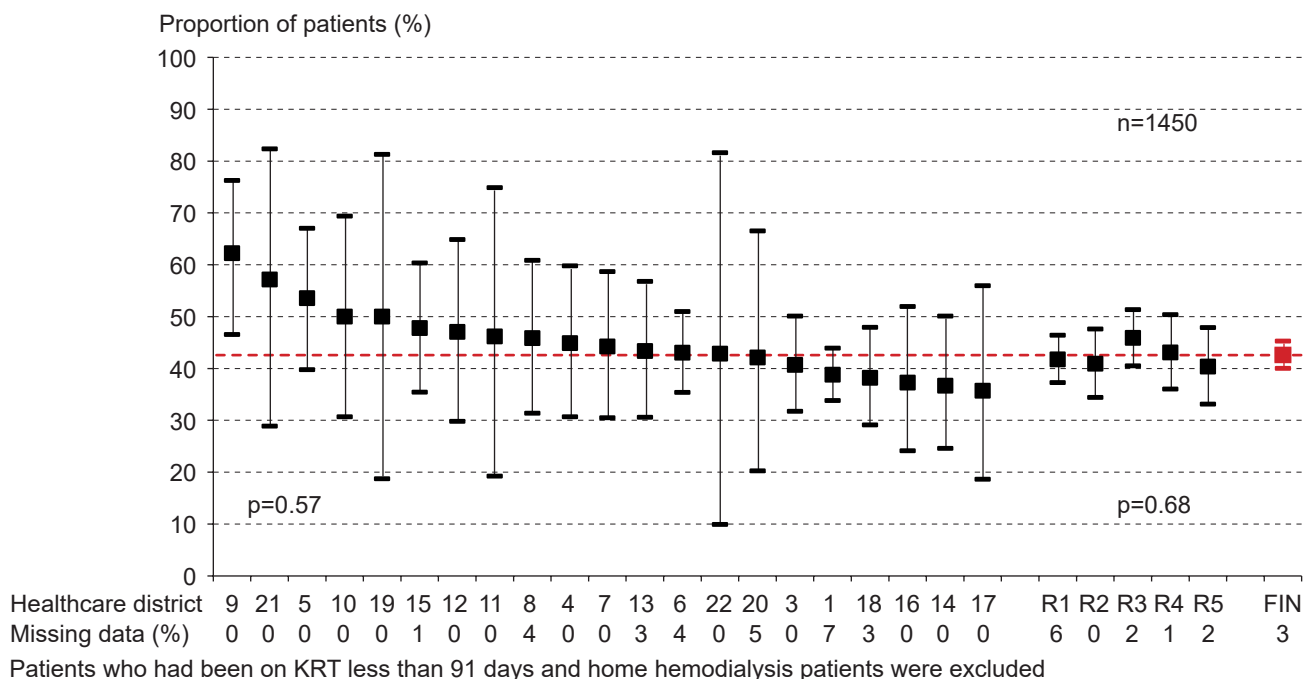
At the end of 2020, the proportion of patients with a fistula or graft varied between 57% and 100% in healthcare districts ($p=0.06$) and between 79% and 87% in regions ($p=0.06$) (Figure 31). At the end of 2020, female hemodialysis patients less frequently than male patients had a fistula or graft (80% vs. 88%, $p<0.001$). A fistula or graft was as common in patients over 75 years as in younger patients.

Figure 32. Distribution of predialytic blood pressure among hemodialysis patients older than 20 years Finnish Registry for Kidney Diseases 2010–2020



Patients who had been on KRT less than 91 days and home hemodialysis patients were excluded

Figure 33. Proportion of hemodialysis patients older than 20 years with predialytic blood pressure <140/90 mmHg in healthcare districts and regions Finnish Registry for Kidney Diseases 2020



According to the guidelines of the Kidney Disease Outcome Quality Initiative (KDOQI), hemodialysis patients' target predialytic blood pressure is <140/90 mmHg. At the end of 2020, 43% of hemodialysis patients reached this target and the proportion increased by 4% in a year after it had been

decreasing until 2019 (Figure 32). The proportion of patients attaining the target varied between 36% and 62% in healthcare districts ($p=0.57$) and between 40% and 46% in regions ($p=0.68$) (Figure 33). No significant difference was observed between the sexes.

Figure 34. Distribution of blood pressure in kidney transplantation patients older than 20 years
Finnish Registry for Kidney Diseases 2010–2020

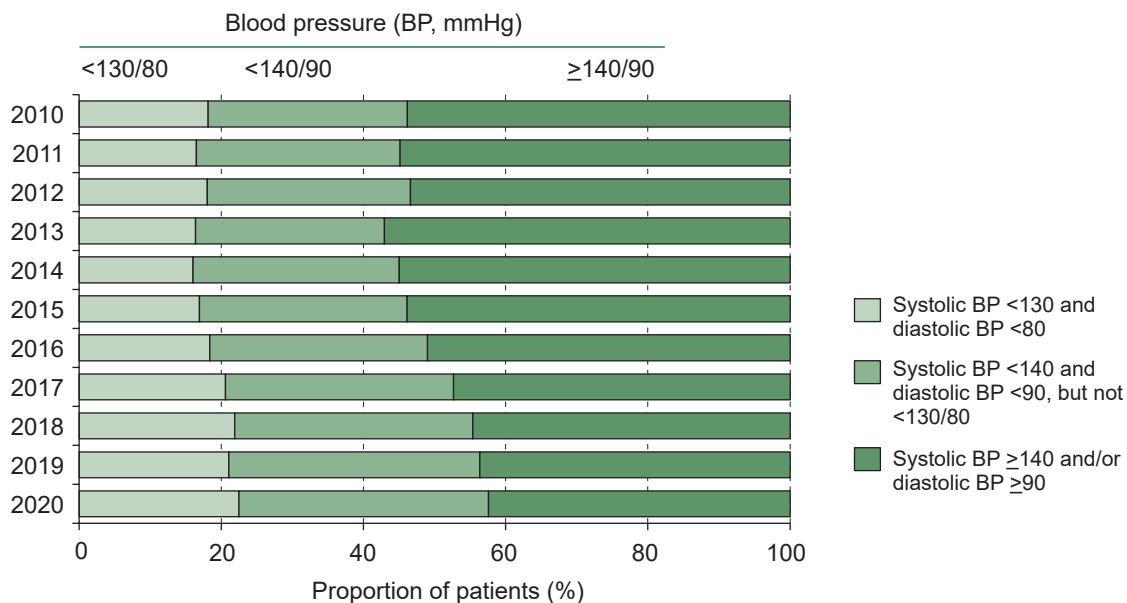
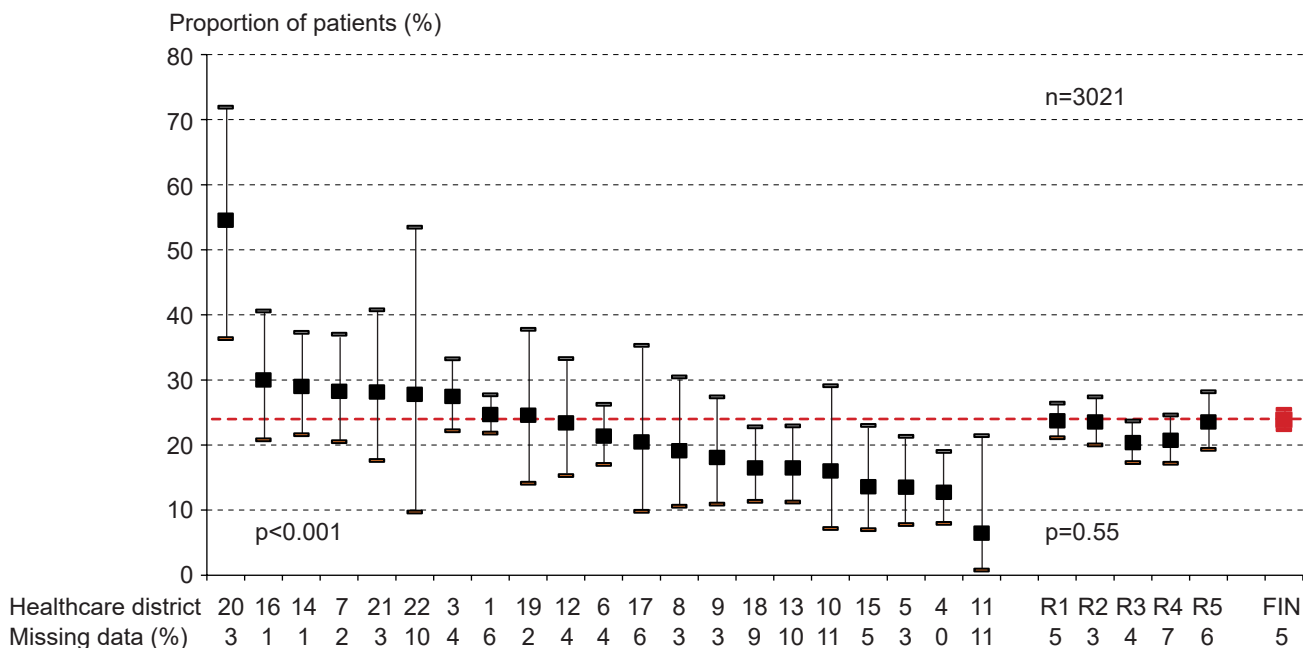


Figure 35. Proportion of kidney transplantation patients older than 20 years with blood pressure <130/80 mmHg in healthcare districts and regions
Finnish Registry for Kidney Diseases 2020



The KDIGO guidelines suggest that the blood pressure target of kidney transplantation patients be <130 mmHg for systolic blood pressure and <80 mmHg for diastolic blood pressure. Figure 34 shows the blood pressure distribution of kidney transplantation patients at the end of the years 2010–2020. The proportion of patients reaching the target (<130/80 mmHg) was 18% in 2010 and 22% in 2020. The

proportion of patients with blood pressure <140/90 mmHg increased from 46% in 2010 to 58% in 2020.

At the end of 2020, the proportion of kidney transplantation patients attaining the blood pressure target varied between 6% and 55% in healthcare districts ($p<0.001$) and between 20% and 24% in regions ($p=0.55$) (Figure 35). No significant difference was observed between the sexes.

Figure 36. Distribution of serum LDL cholesterol among kidney transplantation patients older than 20 years Finnish Registry for Kidney Diseases 2010–2020

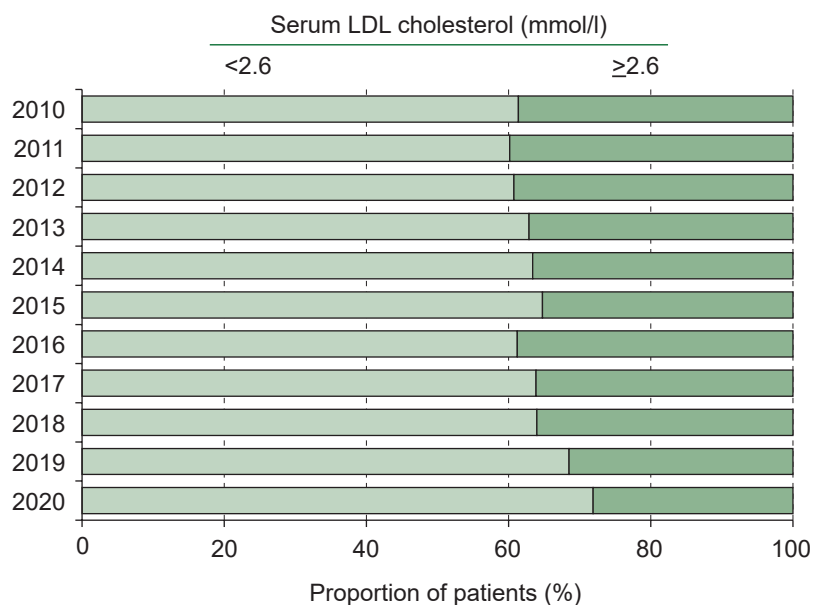
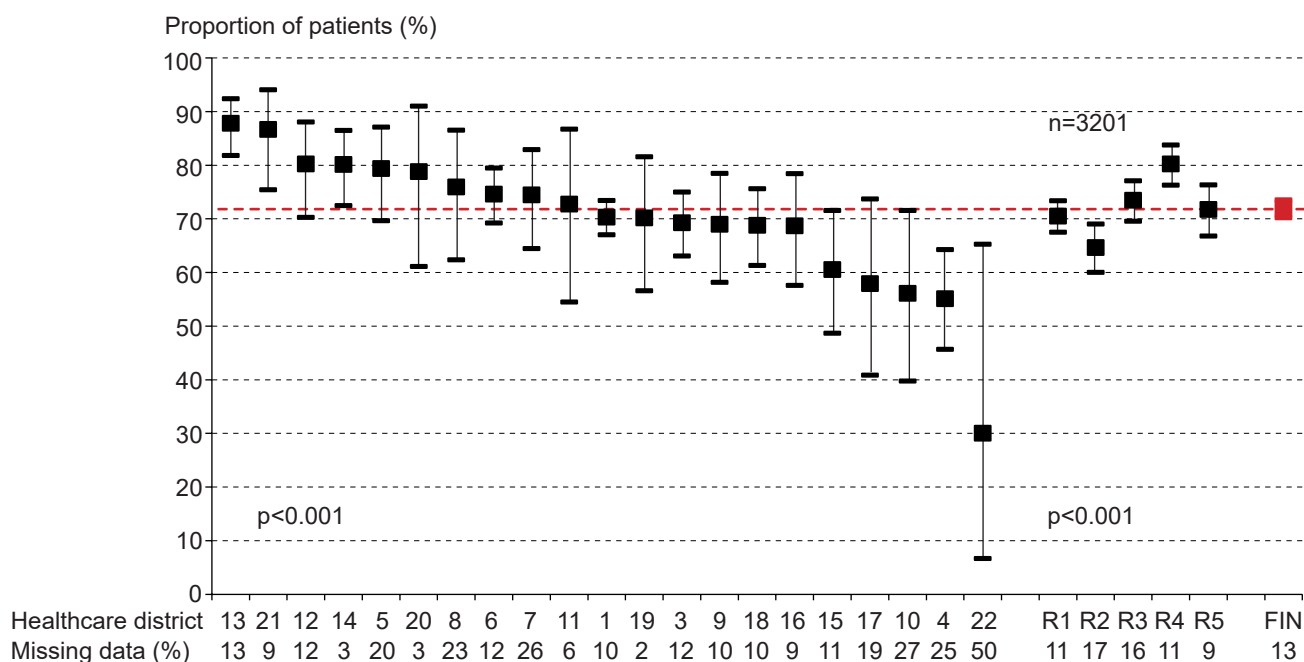


Figure 37. Proportion of kidney transplantation patients older than 20 years with serum LDL cholesterol <2.6 mmol/l in healthcare districts and regions Finnish Registry for Kidney Diseases 2020



According to the KDIGO and KDOQI guidelines, kidney transplantation patients' concentration of serum low-density lipoprotein (LDL) cholesterol should be <2.6 mmol/l. In 2020, 72% of kidney transplantation patients reached this target and the proportion had increased from the recent years (Figure 36).

The proportion of kidney transplantation patients reaching the treatment target for LDL cholesterol varied between 30% and 89% in healthcare districts ($p<0.001$) and bet-

ween 65% and 80% in regions ($p<0.001$) (Figure 37). Male patients reached the treatment target more often than female patients (75% vs. 68%, $p<0.001$).

The concentration of LDL cholesterol was calculated using the Friedewald formula based on serum concentrations of total cholesterol, high-density lipoprotein (HDL) cholesterol, and triglycerides. Because of restrictions of the Friedewald formula, patients with a triglyceride concentration >4.5 mmol/l were excluded.

Figure 38. Time to waitlisting for kidney transplantation of new KRT patients older than 20 years
Finnish Registry for Kidney Diseases 2010–2020

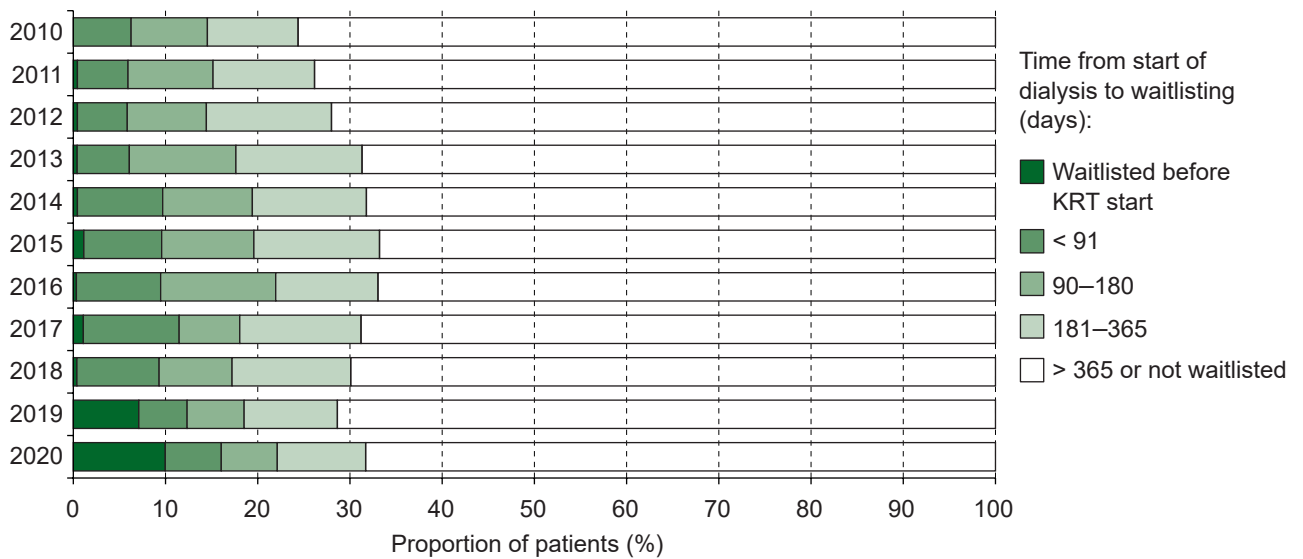
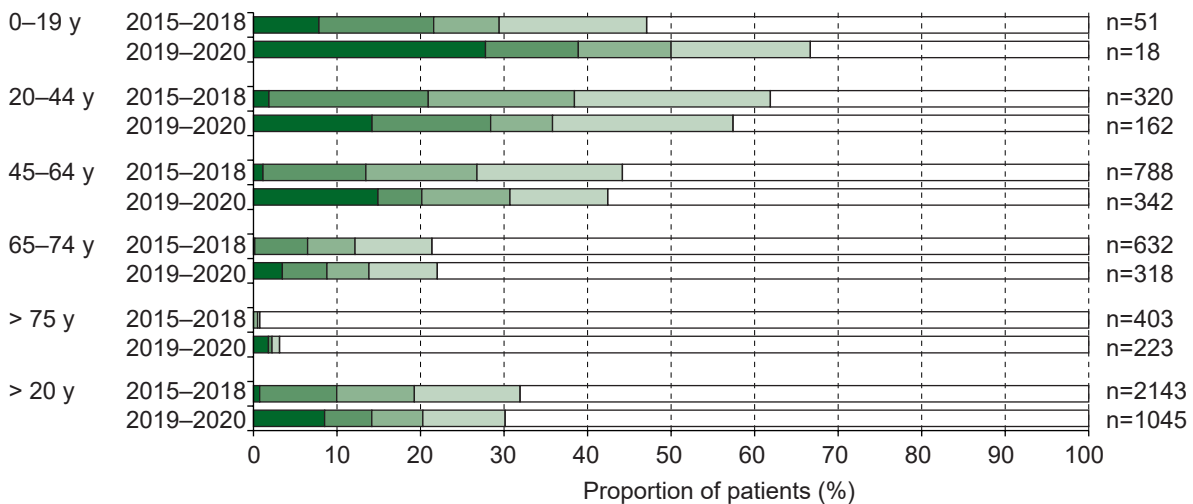


Figure 39. Time to waitlisting for kidney transplantation by age group of new KRT patients
Finnish Registry for Kidney Diseases 2015–2020



In 2010–2020, altogether 5462 patients older than 20 years entered KRT. Figure 38 shows the time from initiation of KRT to waitlisting for kidney transplantation. Since 1 September 2018, it has been possible to waitlist patients for kidney transplantation from a deceased donor before start of dialysis. Of those who started KRT in 2020, 10% were already waitlisted at the start of KRT and this proportion has increased markedly. Nevertheless, within 180 days of KRT initiation, the proportion of patients waitlisted, which was 22% in 2020, had not increased relative to previous years.

Information on waitlisting received from the Transplantation Registry at Helsinki University Hospital covered the period up to 28 October 2020. Because of this, a complete follow-up data of 365 days on waitlisting for kidney trans-

plantation were not available for patient starting KRT after 28 October 2020 (n=99) in the analyses of Figures 38–41. If the follow-up period were complete, the proportion of patients who started RRT in 2020 and were waitlisted in less than a year would increase by about 1–2% in Figure 38.

Figure 39 shows the time from start of KRT until waitlisting for kidney transplantation by age groups in 2015–2018 and in 2019–2020. Patients aged 0–19 years were waitlisted the most quickly in 2019–2020, with the proportion of patients waitlisted decreasing in older age groups. In patients who started KRT in 2019–2020, 15% of those aged 20–64 years, 3% of those aged 65–74 years, and 2% of those aged over 75 years were waitlisted before start of KRT.

Figure 40. Time to waitlisting for kidney transplantation of new KRT patients older than 20 years in healthcare regions
Finnish Registry for Kidney Diseases 2015–2020

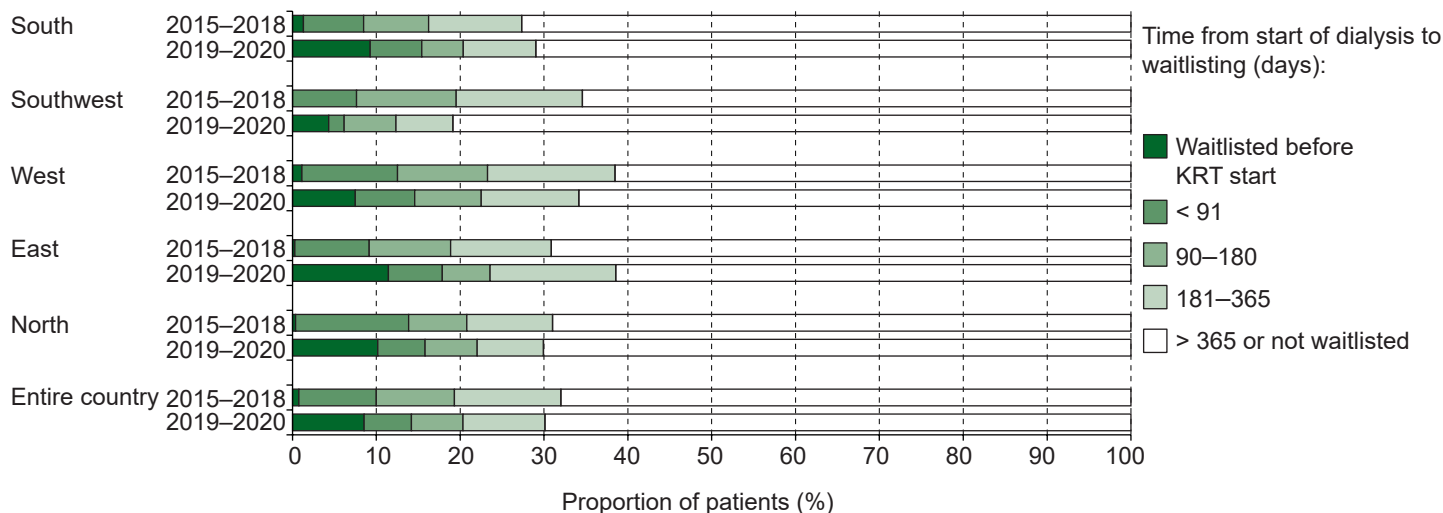


Figure 41. Time to waitlisting for kidney transplantation of new KRT patients older than 20 years
in healthcare districts and regions
Finnish Registry for Kidney Diseases 2016–2020

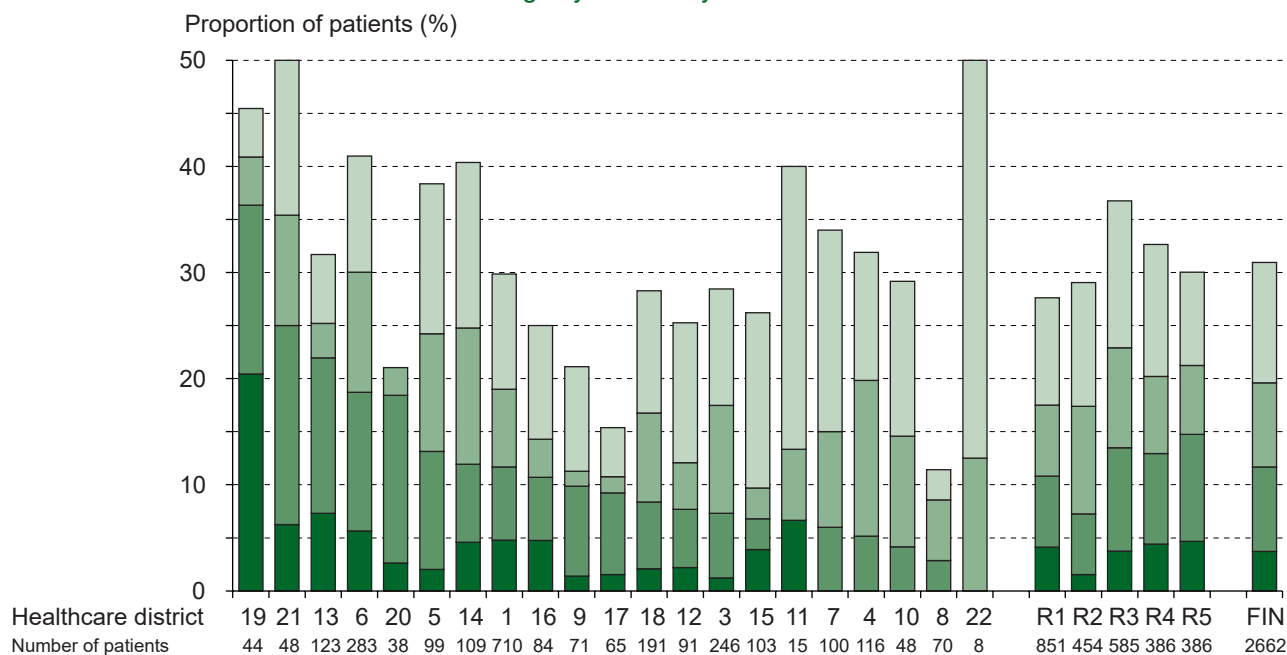


Figure 40 shows the time from start of KRT until waitlisting for kidney transplantation by region in 2015–2018 and in 2019–2020. In all regions, a new practice had been adopted, according to which patients can be waitlisted for kidney transplantation from a deceased donor after 1 September 2018. In 2019–2020, 9% of patients who started KRT had been waitlisted before start of KRT. The proportion was lowest in the southwestern region (4%) and highest in the eastern region (11%), but there was no statistically significant difference between the regions ($P=0.18$). In the entire country, 11% of women and 7% of men who started KRT in 2019–2020 had been waitlisted before start of KRT ($P=0.02$).

Figure 41 shows the proportions of patients waitlisted within one year of start of KRT in 2016–2020. Of the patients, 12% were waitlisted (or had already received a kidney transplant) within 90 days of start of KRT. This proportion ranged from 0% to 36% in healthcare districts ($p<0.001$) and from 7% to 15% in regions ($p=0.01$). Within 90 days of start of KRT, 14% of women and 11% of men were waitlisted for kidney transplantation ($p=0.02$).

Within 180 days of start of KRT, 20% of patients were waitlisted, with the proportion varying between 9% and 41% in healthcare districts ($p<0.001$) and between 17% and 23% in regions ($p=0.07$). Of women, 22%, and of men 18% had been waitlisted within 180 days of start of KRT ($p=0.01$).

Figure 42. Number of Covid-19-infected KRT patients by treatment modality and region
Finnish Registry for Kidney Diseases 2020–2022

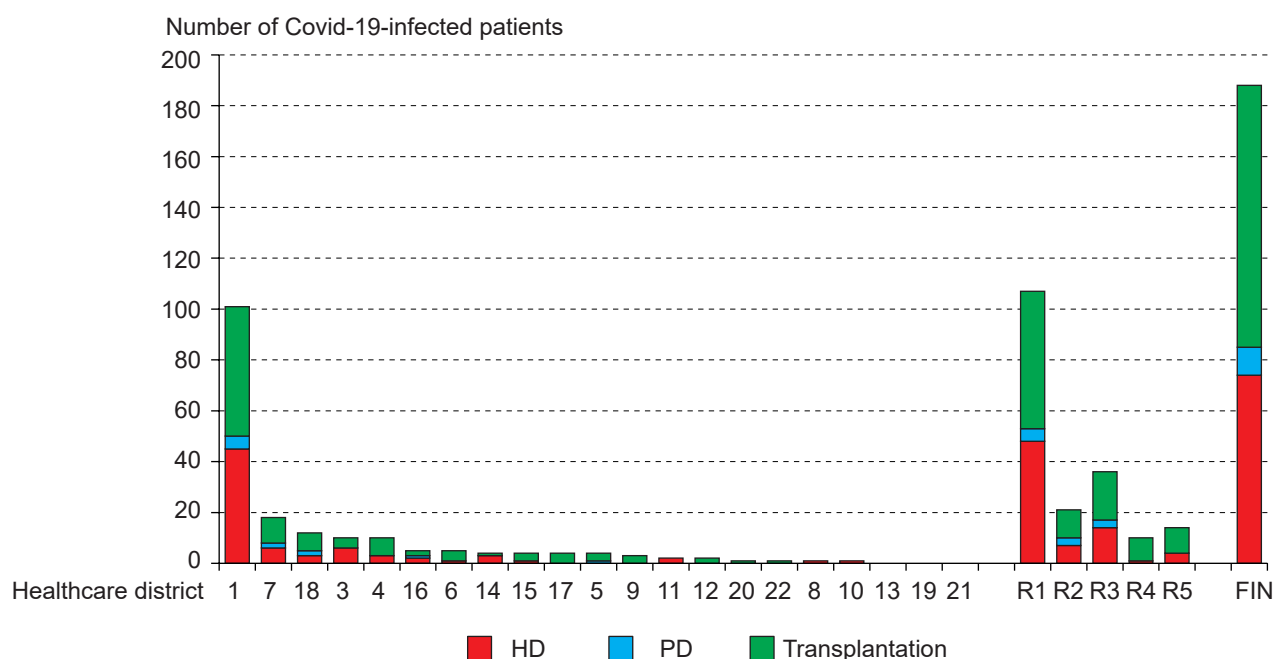
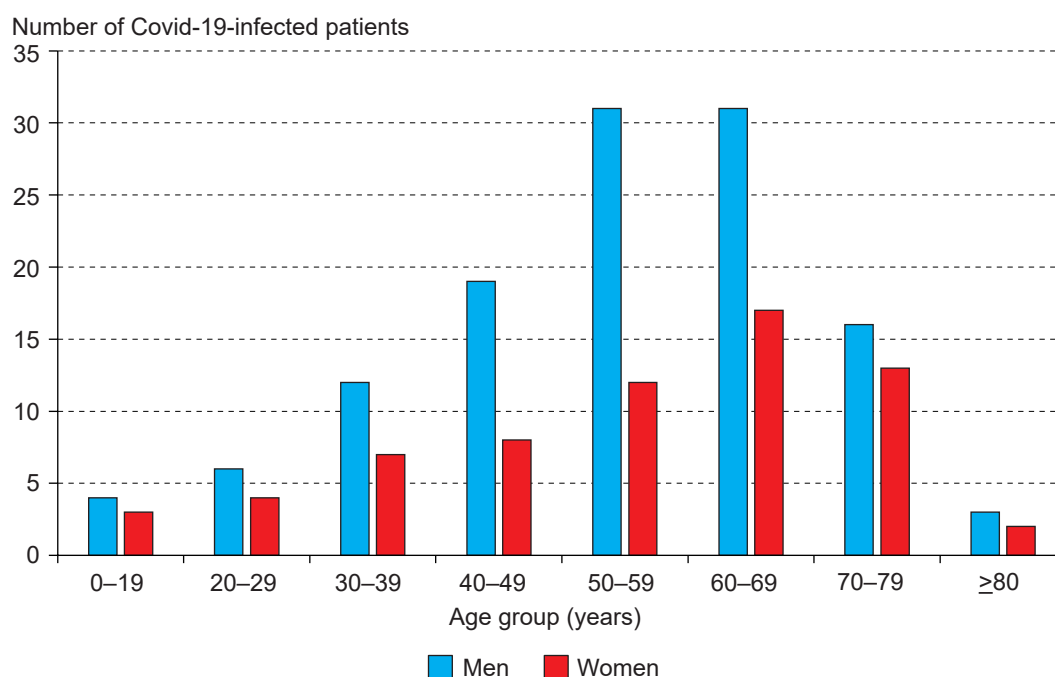


Figure 43. Number of Covid-19-infected KRT patients by age group and sex
Finnish Registry for Kidney Diseases 2020–2022



After the start of the Covid-19 pandemic, the Finnish Registry for Kidney Diseases began collecting data on Covid-19-infected patients receiving KRT from March 2020. Figures 42–45 show Covid-19 infections reported to the registry by 17 January, 2022.

Figure 42 shows the number of Covid-19-infected KRT patients by treatment modality and region. A total of 188 infections have been reported, and more than half of these

have been reported in the healthcare district of Helsinki and Uusimaa. Of the infected patients, 103 were kidney transplant patients, 74 hemodialysis patients, and 11 peritoneal dialysis patients.

Figure 43 shows the number of Covid-19-infected patients by age group and sex. Men aged 50–69 years have had the highest number of infections.

Figure 44. Monthly rate of Covid-19 infections and Covid-19-related deaths in KRT patients Finnish Registry for Kidney Diseases 2020–2022

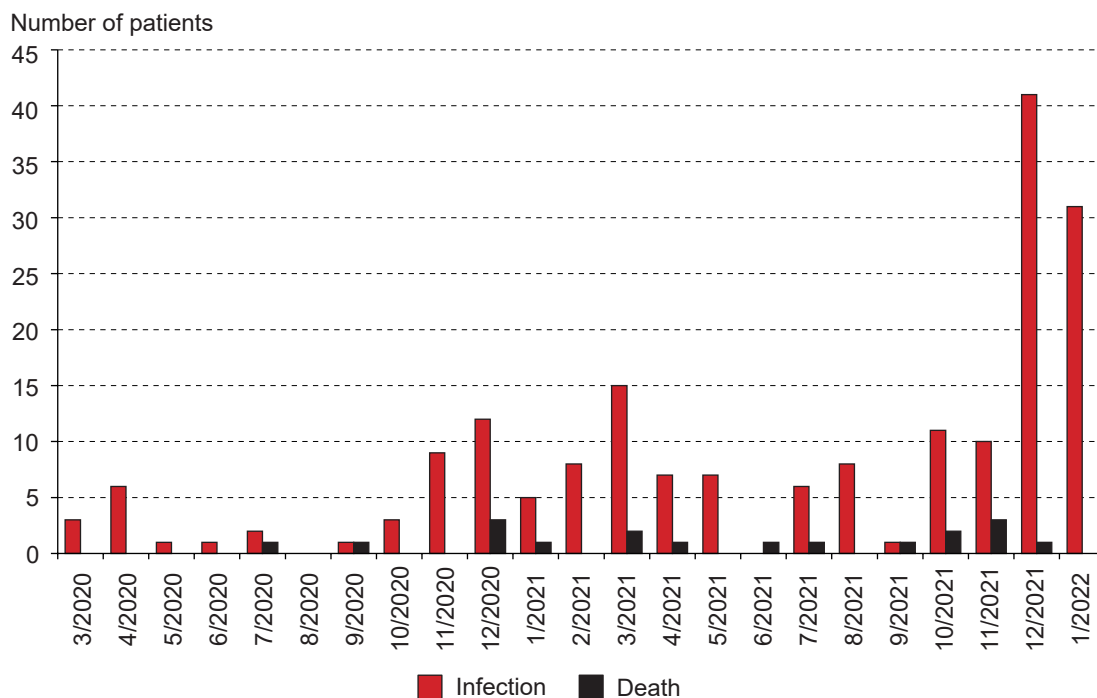


Figure 45. Number of Covid-19 infections and deaths relative to patient-years by primary kidney disease group Finnish Registry for Kidney Diseases 2020–2022

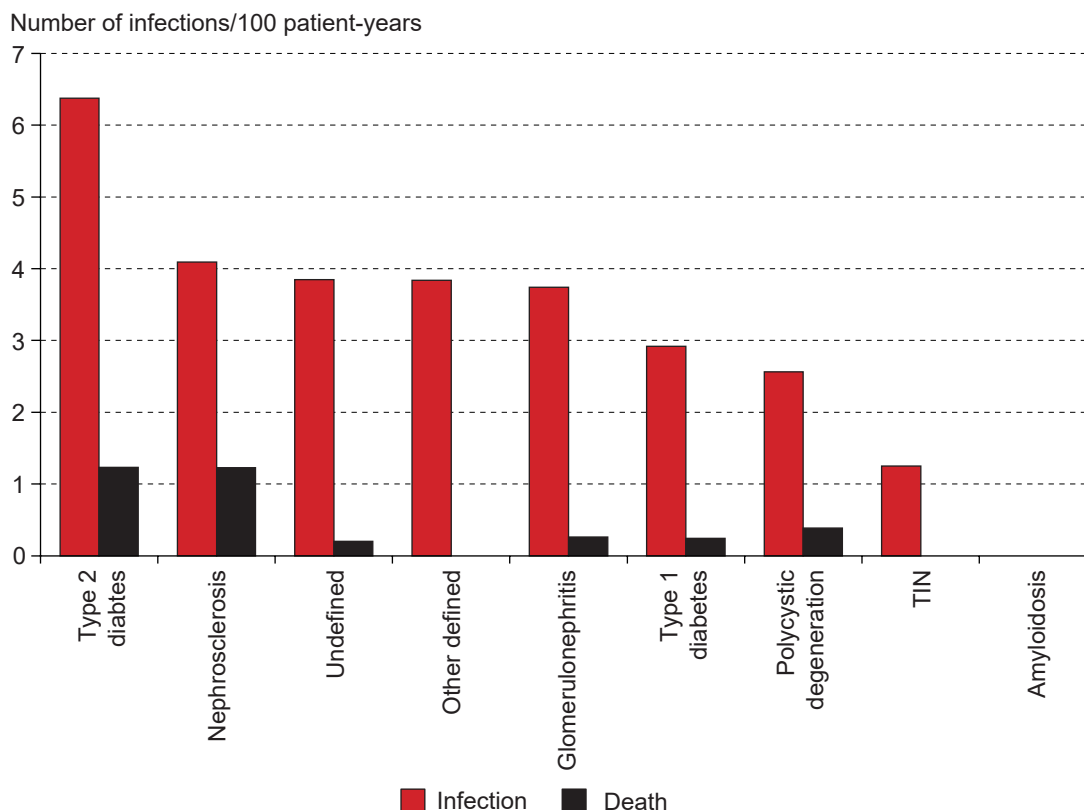


Figure 44 shows the monthly rates of Covid-19 infections and deaths. The number of infections has varied according to the epidemic in the Finnish population. The infection wave caused by the omicron variant at the turn of the year 2021–2022 increased the number of cases to a new maximum. There may also be a delay in reporting the latest results to the registry. Covid-19-related deaths (n=18) are fairly evenly distributed over time.

Infections and deaths relative to patient-years were highest in patients with type 2 diabetes (Figure 45). The average number of Covid-19 cases was 3.58 and of deaths 0.34 per 100 patient-years. Data from 2020 have been used as the number of patient-years. Of those infected with Covid-19, 9.6% died from the disease (10.6% of dialysis patients and 8.7% of kidney transplantation patients).

- Age
 at end of year 2013:16, 2014:17, 2017:22–23, 2018:19, 2019:19, 2020:20
 of new RRT patients 2013:9–10, 2014:9–10, 2017:12–14, 2018:13, 2019:13, 2020:13–14
- Alport's syndrome 2011:25,27
- Amyloidosis 2014:12,13,23, 2016:14,27, 2017:16–18,29–30, 2018:15,31, 2019:15,25, 2020:16,26
- APD (automated peritoneal dialysis) 2010:12,18, 2011:11,17,18,25,27, 2012:23,25, 2013:18,27, 2014:14,19,21, 2015:13,14,19,21, 2016:15,18,23,25, 2017:19,25,27,29–30, 2018:16,21,23, 2019:16,21,23,39,40, 2020:17,22,24
- Blood pressure-lowering medication 2012:31,34, 2013:41,43, 2014:34,36
- CAPD (continuous ambulatory peritoneal dialysis) 2010:12,18, 2011:11,17,18,25,27, 2012:23,25, 2013:18,27, 2014:14,19,21, 2015:13,14,19,21, 2016:15,18,23,25, 2017:19,25,27,29–30, 2018:16,21,23, 2019:16,21,23,39,40, 2020:17,22,24
- Changes in type of treatment 2011:21, 2012:20, 2013:23, 2014:24, 2015:24, 2016:28–29, 2017:31, 2018:26, 2019:26, 2020:27
- Comorbidities
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 coronary artery disease 2018:41–43
 heart failure 2018:41–43
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 hyperlipidemia 2007:34, 2012:35, 2013:44, 2014:37, 2016:45, 2017:45, 2018:40
 left ventricular hypertrophy 2018:41–43
 peripheral vascular disease 2018:41–43
- Congenital nephrosis of Finnish type 2011:25,27, 2017:16–17, 2018:15, 2019:15, 2020:16
- Dialysis time, sufficiency of 2012:29, 2013:39, 2014:32, 2015:33, 2016:40, 2017:38
- Erythropoiesis-stimulating agents 2013:35, 2016:33,34
- Finnish population
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 in healthcare districts 2012:6, 2013:6, 2014:6, 2015:7, 2016:8, 2017:9, 2018:9, 2019:9, 2020:9
 in regions 2012:6–7, 2013:6–7, 2014:6–7, 2015:7–8, 2016:8–9, 2017:9–10, 2018:9–10, 2019:9–10, 2020:9–10
- Glomerular filtration rate 2012:32, 2013:28, 2016:16,17, 2020:33–34
- Goodpasture's syndrome 2016:14, 2017:17–18, 2019:15
- Graft survival
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 in regions 2020:35
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- Granulomatosis with polyangiitis 2017:17
- Hemodiafiltration 2010:18, 2011:11,18, 2012:23,25, 2013:27, 2014:14,21, 2015:13,14,21, 2016:15,18,25, 2017:19,27, 2018:16,23, 2019:16,23, 2020:17,24
- Hemolytic-uremic syndrome 2011:25,27, 2016:14, 2017:17–18
- High blood pressure, see comorbidity
- Home dialysis 2012:24, 2014:21, 2015:13,14,19,21, 2016:15,18,23,25,29, 2017:19,25,27, 2018:16,21,23, 2019:16,21,23,39–42, 2020:17,22,24
- Home hemodialysis 2010:12,18, 2011:11,17,18, 2012:23,25, 2013:18,27, 2014:14,19,21, 2015:13,14,19,21, 2016:15,18,23,25,29, 2017:19,25,27, 2018:16,21,23, 2019:16,21,23,39–42, 2020:17,22,24
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- Kidney biopsy 2017:18
- Kidney cancer 2016:14, 2017:16–17, 2018:15, 2019:15
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 Vasculitis 2016:14, 2017:16–17, 2018:15, 2019:15, 2020:16

Finnish Registry for Kidney Diseases

Report 2020



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