DANSK NEFROLOGISK SELSKAB

Landsregister for patienter
i aktiv behandling for
kronisk nyresvigt
Rapport for Danmark 2003

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Forord

Aktiv behandling af kronisk nyresvigt omfatter dialyse og nyretransplantation. Formålet med Dansk Nefrologisk Selskabs Landsregister (DNSL) er at indhente relevante kliniske og para-kliniske oplysninger om disse patienter og videregive en vurdering heraf. I 1993 udkom den første rapport, som omfattede perioden fra 1/1-90 til 1/1-93. Siden er rapporteringen foregået årligt.

Registrets officielle navn er: *Den landsdækkende kliniske database for patienter i aktiv behandling for kronisk nyresvigt*. Registret ejes af og er hjemmehørende i Københavns Amt.

DNS er ansvarlig for indsamling af talmaterialet og behandling af de indsamlede data. Dette organiseres af et *registerudvalg* nedsat af DNS. Formanden er den til enhver tid siddende formand for DNS. Fast medlem af udvalget er den registeransvarlige, som formelt har ansvaret for datasikkerhed over for såvel DNS som Københavns Amt. Udvalgets øvrige medlemmer består af læger med speciel interesse for registrering og epidemiologisk forskning.

Udvalgets nuværende medlemmer er:

Overlæge *Hans Dieperink*. Formand for registerudvalget. Er ansvarlig for dets funktion og tilfredsstillende relationer til DNS bestyrelse og medlemmer.
Overlæge *Tom Buur* med speciel interesse for registrering af hæmodialyse.
Overlæge *James Heaf* med speciel interesse for P-dialyse.
Overlæge *Hans Løkkegaard*. Registeransvarlig og ansvarlig for drift, kontakt med ansvarlige myndigheder, kontakt til andre registre (Scandiatransplant, Nordiske uræmiregistre, Cancerregister, ERA-EDTA), Datakonsulenter (Uni-C) og endelig udformning af den årlige rapport.
Overlæge *Niels Løkkegaard* med speciel interesse for Hæmodialyse og relationer til Cancerregistret.
Overlæge *Melvin Madsen* med speciel interesse for nyretransplantationer.

Den landsdækkende kliniske database er et Windows-baseret program med de tekniske fordele, den moderne teknik muliggør. Dette program anvendes i år for fjerde gang. Indføring af ny teknik skaber ofte problemer og i de sidste par år har vi måttet igennem en periode med tilretning af tekniske problemer. Dette er nu overstået og i år har indsamling af data og fejlretning været hurtig og effektiv. De tekniske problemer varetages fortsat af *Uni-C*, som vi takker for godt samarbejde. Fremstilling af relevante udtræk til videre statistisk bearbejdning er et af problemerne ved kliniske databaser. Der er derfor i år investeret i fremstilling af en *udtræksgenerator*, som muliggør fremstilling af udtræk fra både den centrale og den decentrale database. Forhåbentlig bidrager dette initiativ til en øget anvendelse af data. Udtræksgeneratoren vil blive præsenteret på årsmødet april 2004.

Vi har bevaret den oprindelige organisation med indtastning af data på de enkelte centre og årlig tilførsel af data centralt via diskette. Den tekniske udformning af databasen tillader anvendelse af Internettet og Uni-C har foreslået en løsning, som vil tillade direkte indtastning på nettet. Alt nyt efterlader ofte en periode med tekniske problemer og organisationen omkring indsamling af data er meget følsom for dette. Med baggrund i de indvundne erfaringer i forbindelse med omlægning til ny teknik, har vi derfor fundet det nødvendigt at forholde os afventende. Registerudvalget drøfter Uni-C's forslag og vender tilbage til problemet ved årsmødet i DNS.

Registret indeholder nu data på 9342 patienter, som 1/1 – 90 enten var eller siden er påbegyndt behandling. Der ydes på de nefrologiske afdelinger en betydelig indsats med indtastning af data og der er god grund til at takke de mange, som har været involveret i dette betydelige arbejde.

I 1997 lykkedes det at etablere samarbejde med *Scandiatransplant* og *Cancerregistret*. Der er siden udvekslet data mellem DNSL og nævnte registre. I 1997 muliggjorde dataudvekslingen en analyse af vævstypernes betydning for 8 års nyretransplantation. I 1998 resulterede samarbejdet med Cancerregistret i den første analyse af cancerudviklingen i Danmark hos patienter i aktiv behandling for terminal nyreinsufficiens. Samarbejdet med de to registre fortsætter. I år indeholder rapporten en analyse af bl.a. vævstypernes betydning for transplantationsforløbet. Vi har for nylig fået overført cancerdiagnoser fra *Sundhedsstyrelsens* cancerregistrering og er i gang med at analysere disse. Et samarbejde mellem de *nordiske uræmiregistre* er under opbygning. Endelig fortsætter samarbejdet med *ERA-EDTA registret*, som hvert år modtager data via DNSL. Et samarbejde med *danske nyrepatologers* registrering af nyrelidelser er under udarbejdelse.

Dette års udgave indeholder igen en række *parakliniske parametre* beregnet til at vurdere kvaliteten af forskellige terapeutiske tiltag. Antallet af parakliniske parametre er beskedent, et forhold som næppe ændres før den moderne teknik tillader automatisk overførsel af laboratorieresultater fra sygehusenes EDB-systemer - en udvikling, som forhåbentlig vil accelerere de nærmeste år. Disse parametre vil med tiden være værdifulde værktøjer til at sikre en ensartet god behandlingskvalitet i Danmark.

Også i år er fremstillingen af data delt i en *basisdel*, som viser en række væsentlige demografiske data, samt nogle tillæg, som mere går i dybden med specielle emner. De specielle emner omfatter i år en ny *prognostisk vurdering*, en gennemgang af *transplantationsresultater* i relation til en lang række parametre og endelig en *sammenligning af dødeligheden* hos dialysepatienter i USA og Danmark.

Registrering af patientdød har vist sig at være et svagt punkt i registreringen. Vi har derfor valgt hvert år at samkøre registrets data med CPR-registret. Denne usikkerhed skulle hermed være elimineret.

April 2004

Hans Løkkegaard
Registeransvarlig
National koordinator

Preface

The Danish Registry on Regular Dialysis and Transplantation was founded in 1990, and since then all patients actively treated for end-stage renal disease (ESRD) have been registered – now including 9372 patients. Data is input using identical software programs in all renal centres, and once yearly data are sent to a central database. Here the material is checked for errors, and appropriate corrections are made in dialogue with the reporting centres. Finally, a national report is prepared, and data are transferred to the registry maintained by the European Dialysis and Transplant Association (EDTA), the Danish Cancer Registry and Scandiatransplant.

Data exchange with the Danish Cancer Registry and Scandiatransplant was started in 1997. In 1998 this collaboration resulted in a report concerning the influence of tissue typing on graft survival in Denmark since 1990. Moreover, in 1999 the first report on development of cancer in Danish ESRD patients was published.
The registry was founded and is maintained by the Danish Society of Nephrology (DNS). Reports are published annually.

April 2004

Hans Løkkegaard
National Co-ordinator

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Prævalensdata 1991 – 2003

Incidensdata 1990 - 2003

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Nyretransplantation /*Renal Transplantation*

Dødsårsager/*Causes of death*

Tillæg/*Supplement*

Fig. 1. Renal centres in Denmark 2003

Renal Centres and Population in Denmark

Transpl. Centre	County	Dialysis center	Population
Skejby	Århus	Skejby	637122
	Nordjylland	Aalborg	494153
	Ringkøbing	Holstebro	272857
	Viborg	Viborg	233186
	Total Skejby		**1637318**
Odense	Fyn	Odense	471974
	Ribe	Esbjerg	224345
	Sønderjylland	Sønderborg	253482
	Vejle	Fredericia	347542
	Total Odense		**1307343**
Herlev	Københavns amt	Herlev	
	Total Herlev		**613444**
Rigshospitalet RH	Bornholm	Rønne	44337
	Frederiksberg	RH	90327
	Frederiksborg	Hillerød	365306
	Færørerne	RH	43751
	Grønland	RH	56124
	København	RH	495699
	Roskilde	Roskilde	231559
	Storstrøm	Nykøbing F	259106
	Vestsjælland	Holbæk	295086
	Total RH		**1881295**
Total population 01.01.2002			**5439400**

Table 1. Population and renal centres in Denmark as of 01.01.02.
Statistical Yearbook 2002

Prevalence of ESRD 1991 - 2003

Patients on dialysis or with a functioning graft

Treatment	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
CAPD	336	329	362	366	372	359	384	380	412	363	351	303	305
APD	12	10	16	29	33	45	66	78	112	161	246	279	319
Center-IPD	35	27	29	18	18	13	10	8	8	8	4		4
PD + HD									2	7	5	10	8
Home-IPD	1	2	1	0	5	15	12	11	6	3	1	1	1
Center-HD	608	623	711	764	854	936	1043	1165	1280	1438	1562	1681	1683
Lim. Care	37	38	42	43	52	62	57	68	64	73	72	61	76
Home-HD	21	17	16	17	15	13	9	7	9	11	14	24	33
In dialysis	**1050**	**1046**	**1177**	**1237**	**1349**	**1443**	**1581**	**1717**	**1895**	**2071**	**2260**	**2359**	**2429**
Home	370	358	395	412	425	432	471	476	543	552	622	617	666
PD	349	341	379	395	410	419	462	469	532	534	603	583	625
HD	21	17	16	17	15	13	9	7	9	11	14	24	33
PD+HD									2	7	5	10	8
Center	680	688	782	825	924	1011	1110	1241	1352	1519	1638	1742	1763
Transpl.	**927**	**1005**	**1073**	**1137**	**1154**	**1218**	**1230**	**1257**	**1308**	**1346**	**1387**	**1469**	**1558**
In treatment	**1977**	**2051**	**2250**	**2374**	**2503**	**2661**	**2811**	**2974**	**3203**	**3417**	**3647**	**3828**	**3987**

Table 2. Treatment modalities for ESRD 1991- 2003. The number of patients on dialysis has increased steadily from 1991 through 2003. However the number of Center-HD patients have not increased in contrast to Lim-Care and Home-HD patients. APD is now the most frequent used method in peritoneal dialysis.

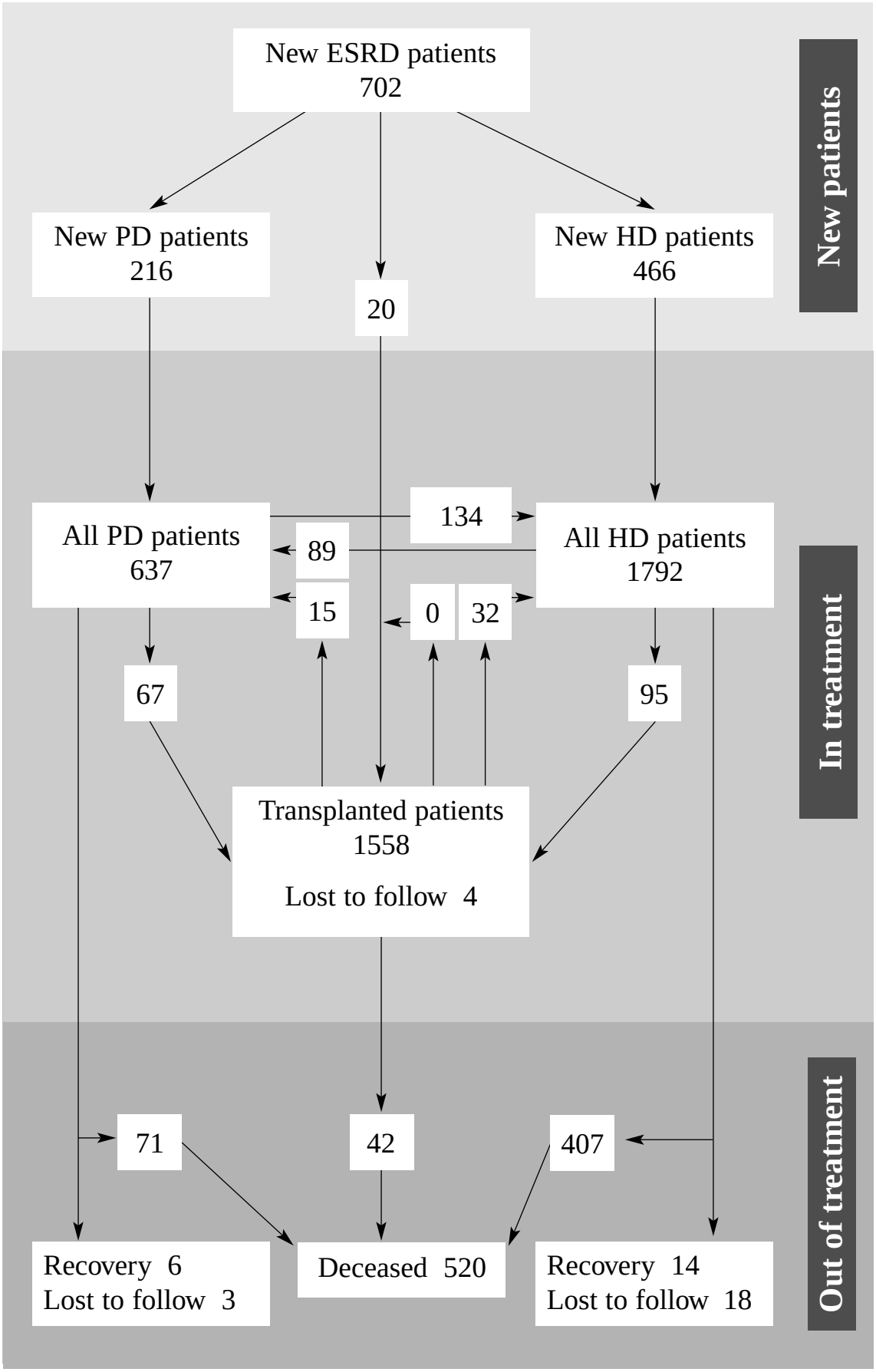


Fig. 2. Changes in the number of patients treated for ESRD during 2003 – status as of 31.12.03. 702 patients started treatment (HD, PD, RAT) in 2003. At the end of the year 2429 patients were on dialysis and 1558 had a functioning renal allograft.

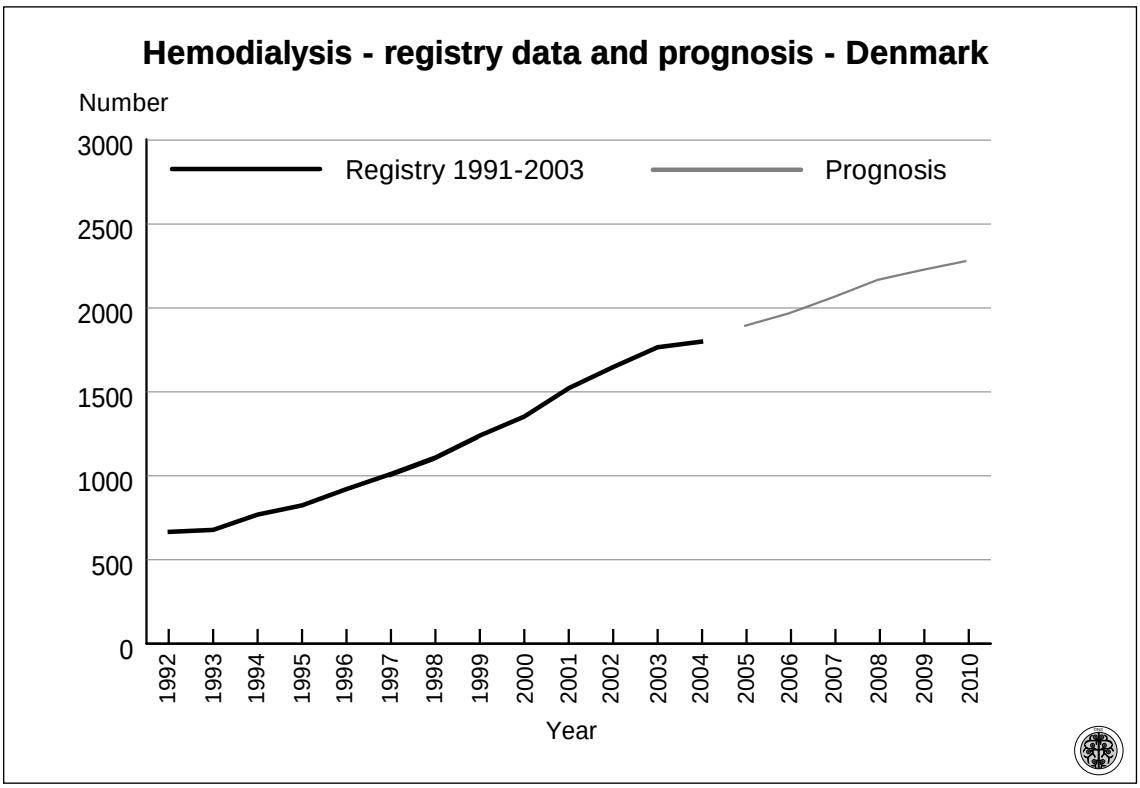

Hemodialysis - registry data and prognosis - Denmark
Number
3000
2500
2000
1500
1000
500
0
Registry 1991-2003
Prognosis
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Year

Fig. 3

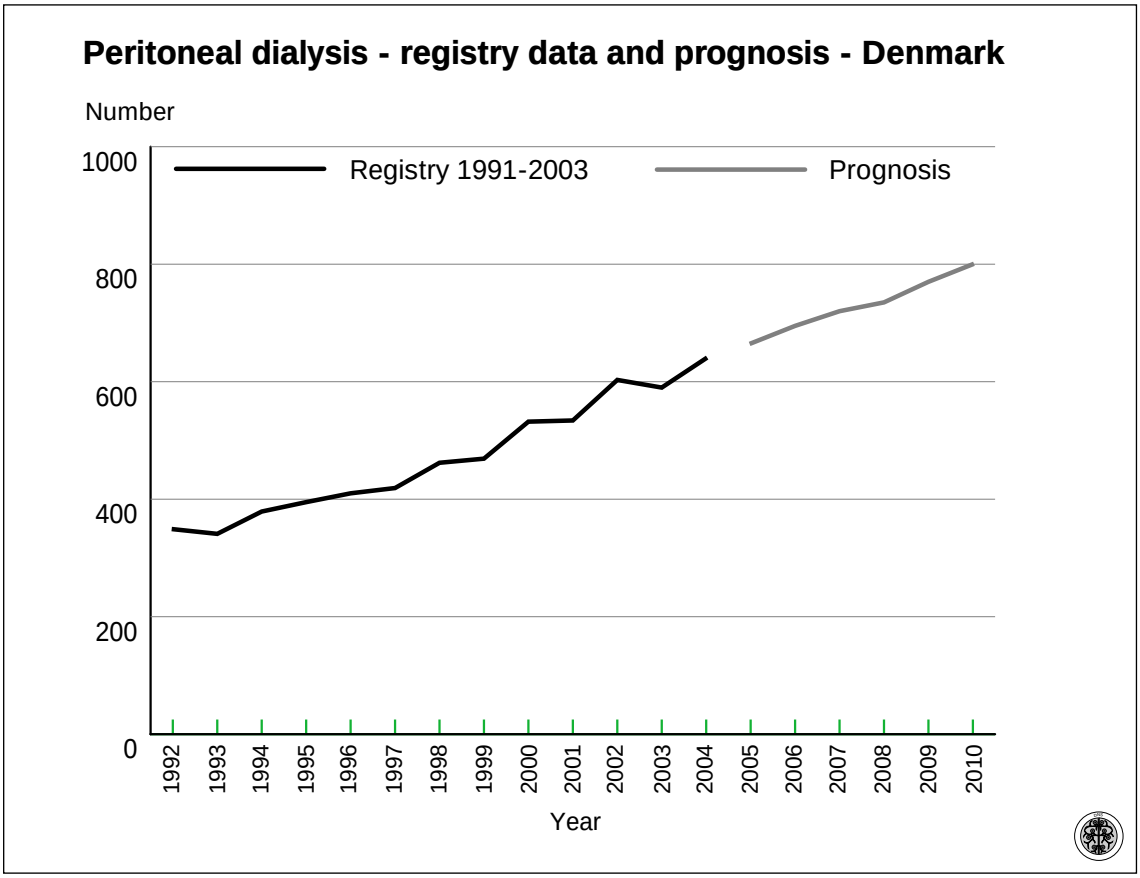

Peritoneal dialysis - registry data and prognosis - Denmark
Number
1000
800
600
400
200
0
Registry 1991-2003
Prognosis
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Year

Fig. 4

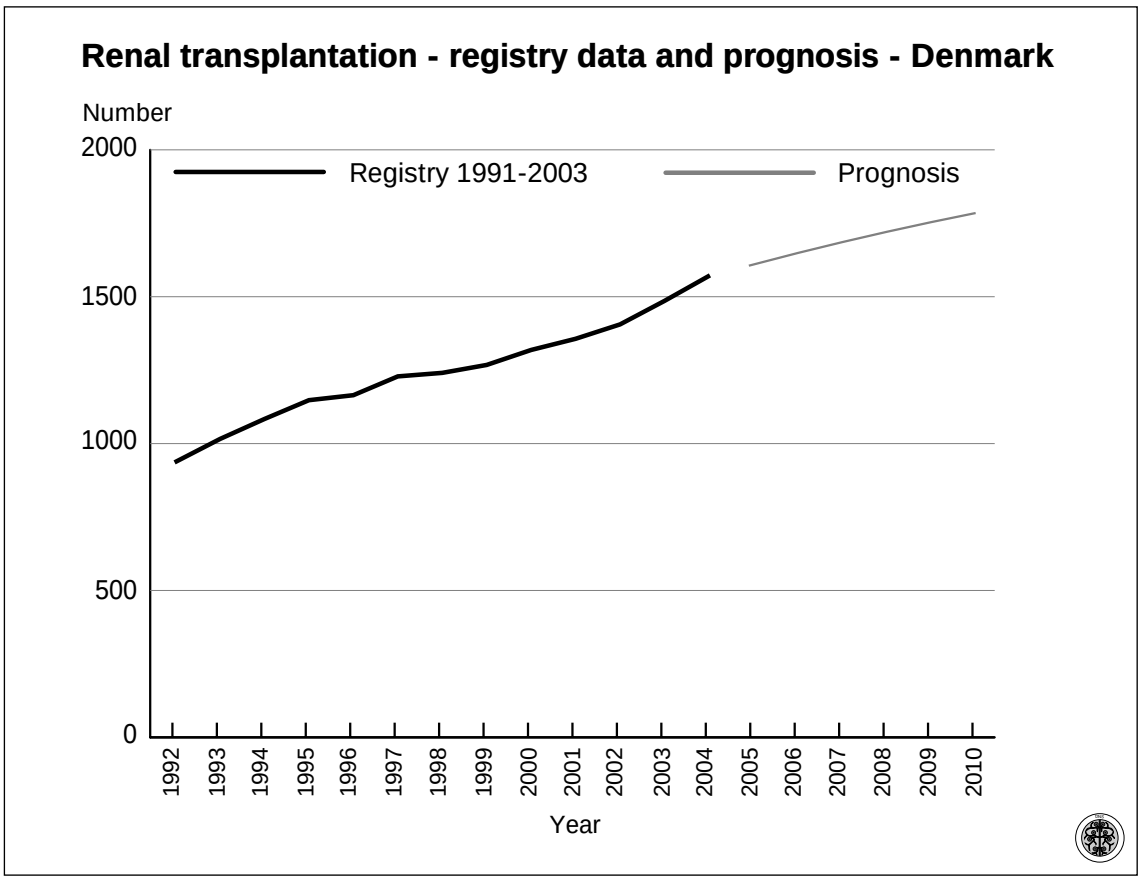


Fig. 5

Fig. 3, 4 and 5. Prognostic calculations concerning the number of hemodialysis (HD), peritoneal dialysis (PD) and transplanted patients from 01.01.2005 to 01.01.2010.The calculations are based on data from 1991 – 2003.

The Prognosis is based on the assumption, that the incidence has reached a stable maximum, and that mortality is unchanged. During the last 4 years the incidence has been stable - 130 per million inhabitants.
For further details see Peter Vestergaard: Prognosis for dialysis and kidney transplant activity in Denmark page 52.

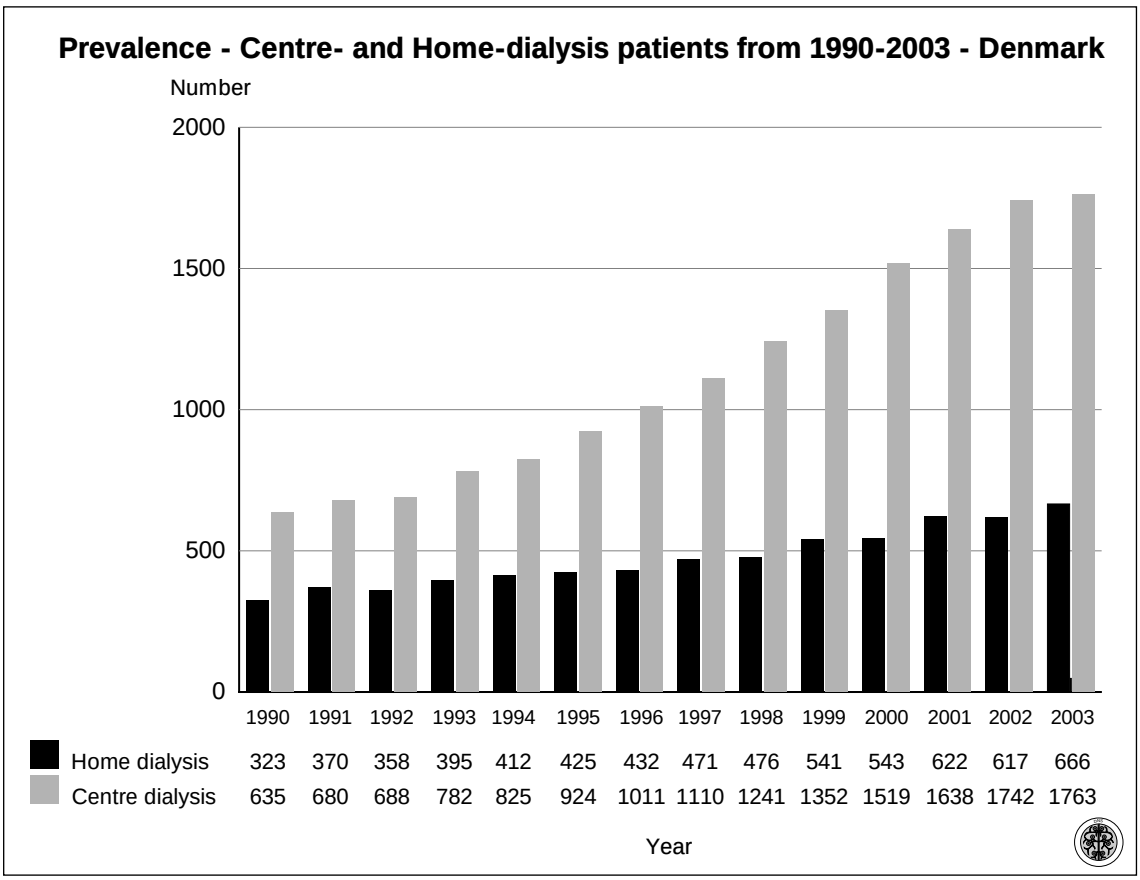


Fig. 6

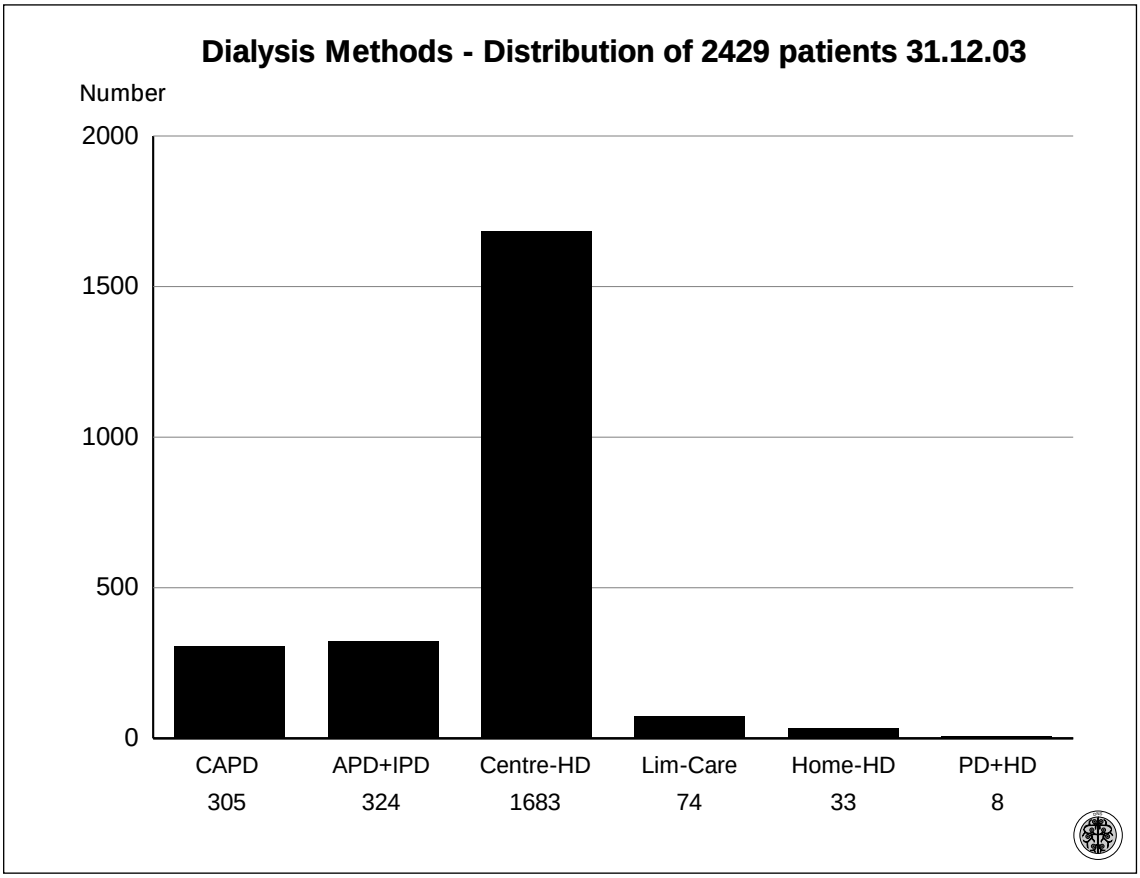


Fig. 7 Dialysis methods used in 2003

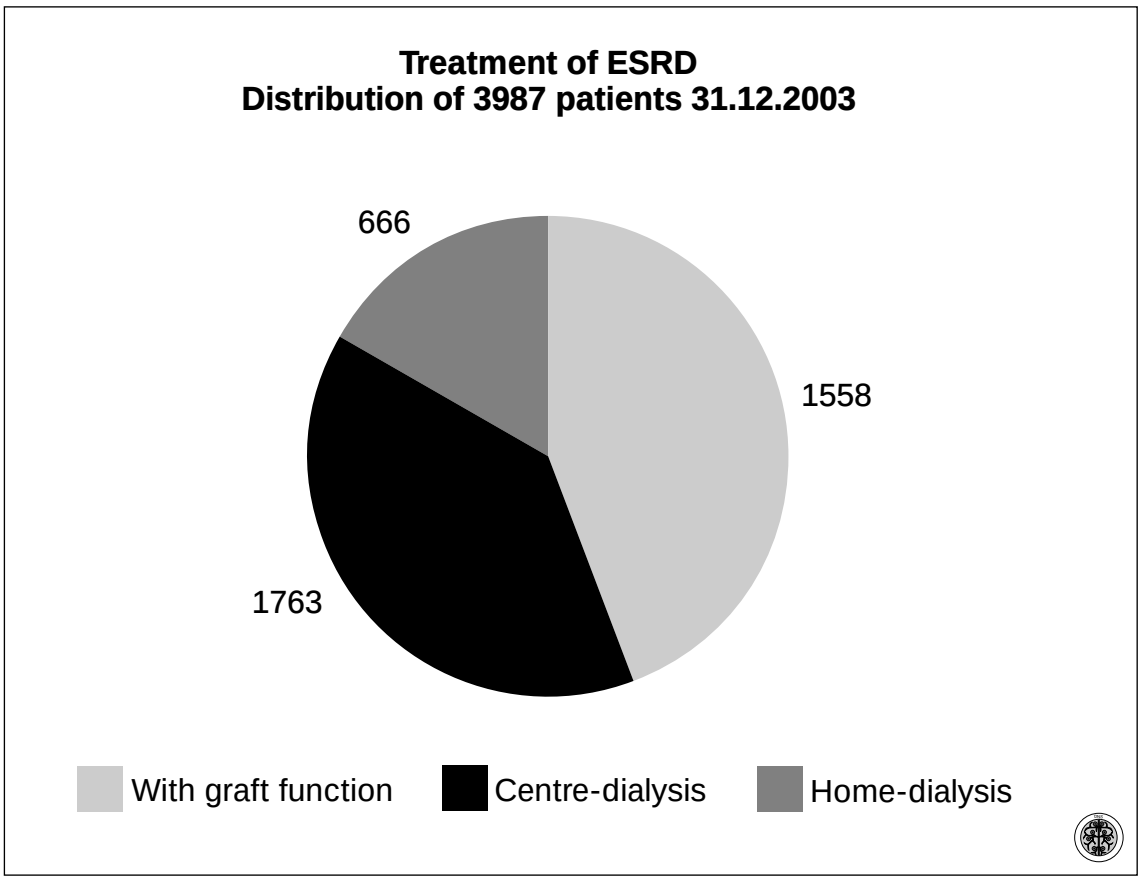

Treatment of ESRD
Distribution of 3987 patients 31.12.2003
666
1558
1763
With graft function
Centre-dialysis
Home-dialysis

Fig. 8

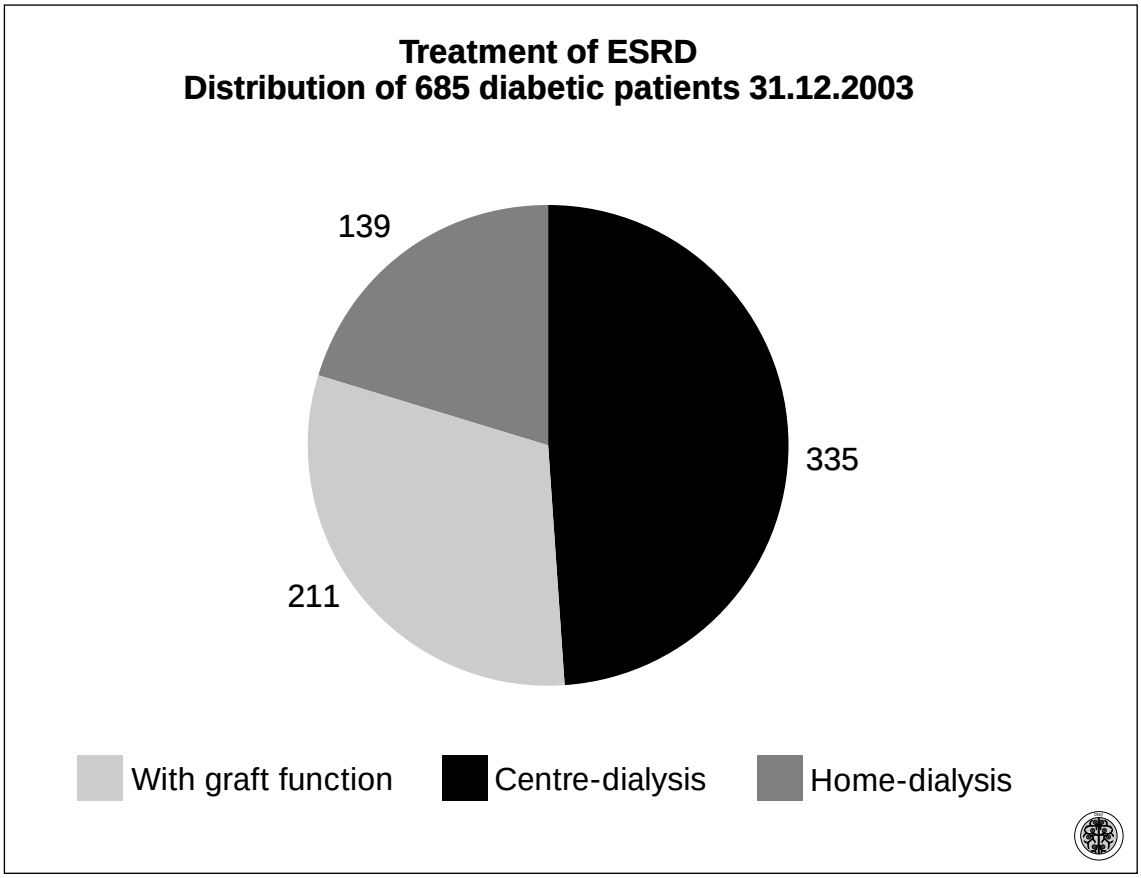

Treatment of ESRD
Distribution of 685 diabetic patients 31.12.2003
139
335
211
With graft function
Centre-dialysis
Home-dialysis

Fig. 9

Incidence of ESRD

Centre	1990		1991		1992		1993		1994		1995		1996		1997		1998		1999		2000		2001		2002		2003	
	No.	Inc.	No.	Inc.	No.	Inc.	No.	Inc.	No.	Inc.	No.	Inc.	No.	Inc.	No.	Inc.	No.	Inc.	No.	Inc.	No.	Inc.	No.	Inc.	No.	Inc.	No.	Inc.
Esbjerg	10	46	6	27	15	68	25	114	13	59	13	57	17	77	19	85	17	76	32	143	33	147	36	160	25	111	22	98
Fredericia	14	42	21	63	17	51	26	79	25	75	29	86	26	77	31	91	33	96	42	122	56	162	43	123	39	111	47	135
Herlev	45	75	39	65	36	60	39	65	50	83	40	66	54	89	66	108	62	102	75	123	47	77	67	109	76	123	78	127
Hillerød																							41	112	38	103	46	126
Holbæk					1	3			2	7	2	7	22	76	35	120	24	82	24	82	40	137	40	136	38	127	35	118
Holstebro	10	37	11	37	13	48	19	71	21	78	28	104	28	104	17	62	24	88	29	107	30	110	41	150	26	95	25	92
Hvidovre	33	60	48	87	39	71	59	107	43	78	49	88	68	121														
Nykøbing F																									9	RH	6	RH
Odense	45	98	52	73	39	55	42	59	55	118	55	118	31	66	51	108	43	91	59	125	47	100	67	142	52	110	81	171
Rigshosp.	70	56	87	69	110	87	124	109	115	153	119	114	103	136	97	90	177	137	183	141	218	168	142	150	154	163	137	136
Roskilde							12	54	15	68	13	58	12	57	17	75	37	162	21	92	23	101	28	121	24	102	12	52
Rønne															1	22	6	136	5	111	2	45	1	23		RH		RH
Skejby	54	90	49	81	39	65	66	110	47	77	73	118	45	73	74	118	73	117	79	125	103	163	114	179	102	158	114	179
Sønderbg.											14	56	28	111	28	110	24	95	28	110	18	71	30	118	30	118	25	99
Viborg	19	83	18	78	13	56	26	113	26	113	25	109	19	85	25	107	19	82	22	94	22	94	32	137	29	124	28	120
Ålborg	30	62	34	69	38	77	54	111	32	66	48	98	56	114	41	85	48	98	54	110	60	122	71	144	56	113	46	93
Denmark	**330**	**63**	**365**	**70**	**360**	**69**	**492**	**94**	**445**	**86**	**508**	**97**	**510**	**98**	**539**	**100**	**587**	**104**	**653**	**121**	**699**	**129**	**753**	**138**	**698**	**128**	**702**	**129**

Table 3. New patients (number per million per year) 1990 – 2003 in the renal centres. The incidence in Denmark was rather stable from 1995 - 98 - about 100. Since then the incidence has increased and is now about 130.

Age distribution 1990 - 2003

Year	00-19	20-29	30-39	40-49	50-59	60-69	70-79	>=80	%>=60
1990	2	11	7	24	18	25	12	0	37
1991	3	7	9	17	23	25	16	0	41
1992	5	5	13	16	24	21	15	1	37
1993	3	5	9	17	21	26	19	1	46
1994	2	7	14	14	20	24	18	1	43
1995	3	8	9	16	17	26	20	1	47
1996	2	6	9	13	18	26	24	2	52
1997	2	5	10	12	22	24	23	2	49
1998	3	4	7	14	20	22	26	4	52
1999	1	4	9	12	17	27	24	6	57
2000	2	3	8	12	20	24	24	7	55
2001	2	3	5	9	19	26	27	8	61
2002	2	2	7	9	15	26	30	9	65
2003	1	5	5	11	16	26	28	8	62
Population	**4**	**16**	**14**	**15**	**11**	**9**	**7**	**5**	**21**

Table 4. Percentage age distribution of patients starting treatment for ESRD 1990-2003 For comparison the age distribution of the Danish population is also indicated.

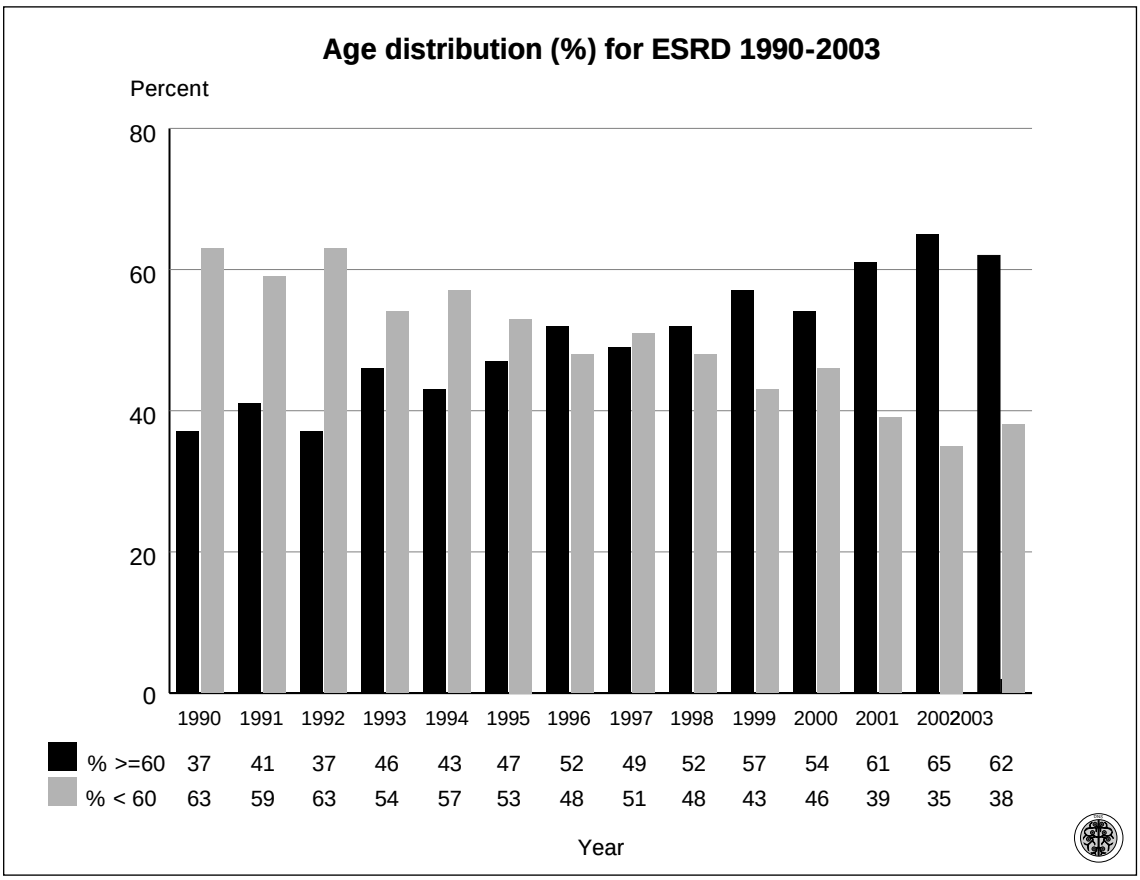

Age distribution (%) for ESRD 1990-2003
Percent
80
60
40
20
0
1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003
% >=60 37 41 37 46 43 47 52 49 52 57 54 61 65 62
% < 60 63 59 63 54 57 53 48 51 48 43 46 39 35 38
Year

Fig. 10

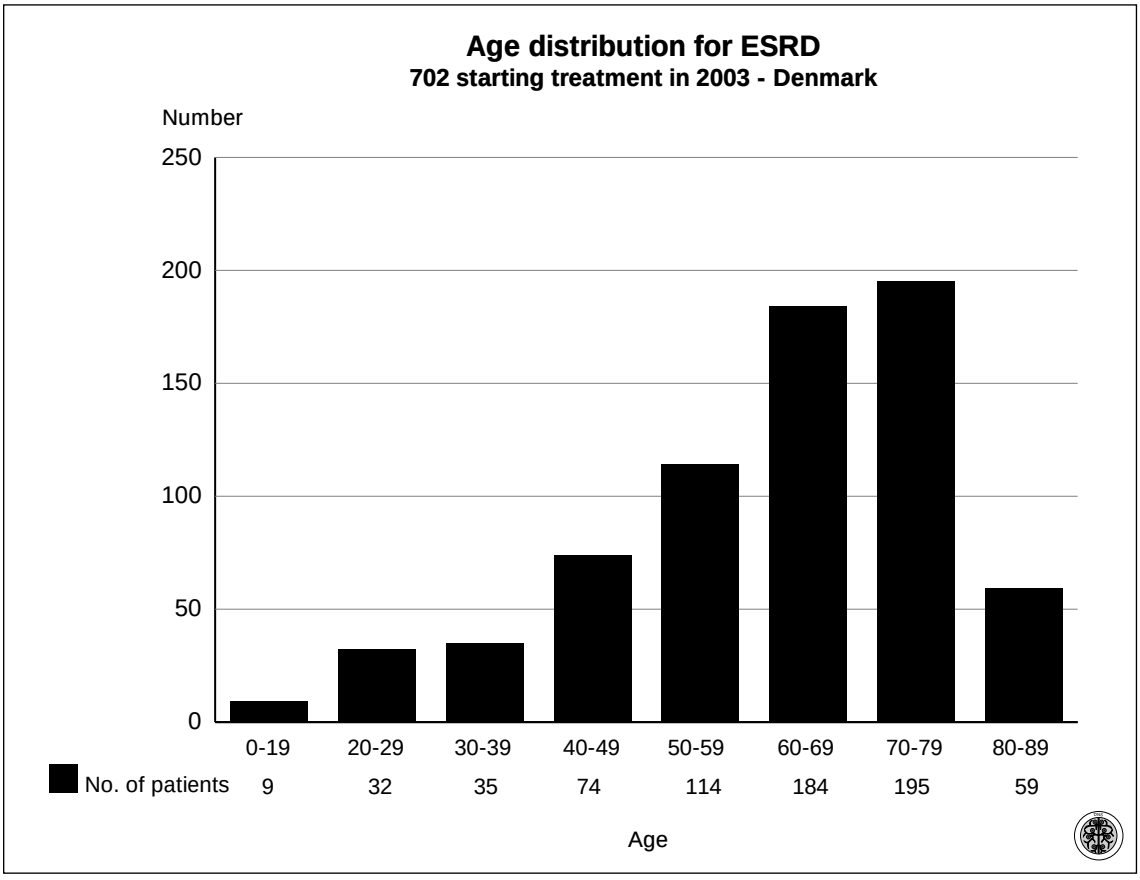

Age distribution for ESRD
702 starting treatment in 2003 - Denmark
Number
250
200
150
100
50
0
0-19 20-29 30-39 40-49 50-59 60-69 70-79 80-89
No. of patients 9 32 35 74 114 184 195 59
Age

Fig. 11

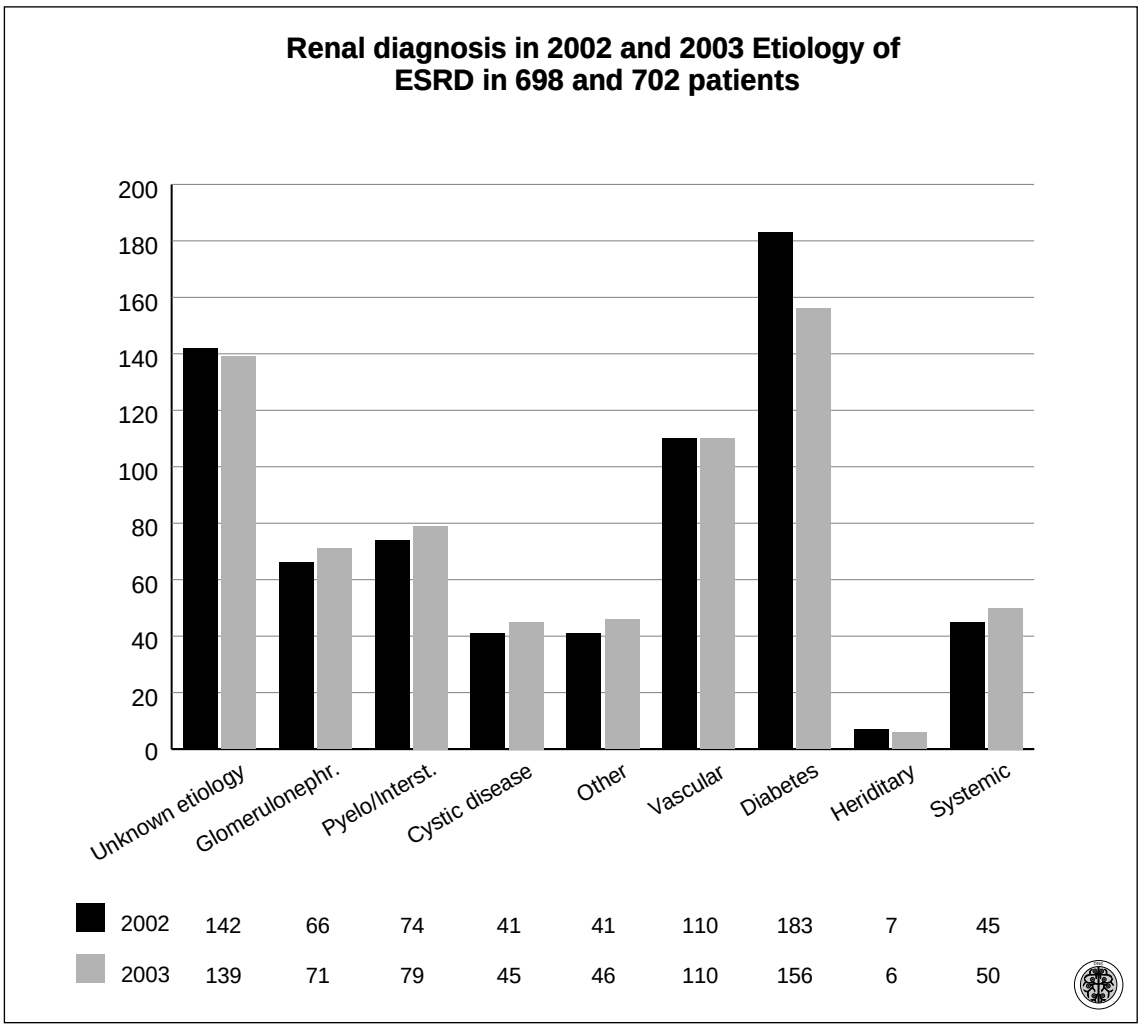


Fig. 12

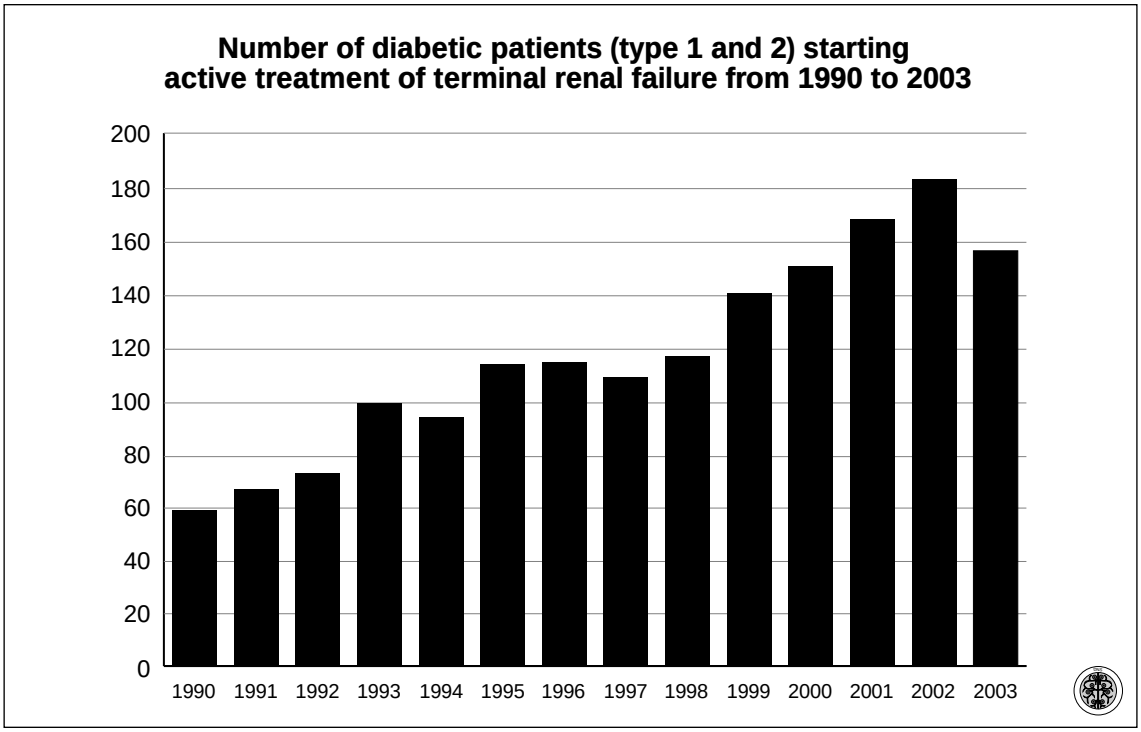


Fig. 13. Number of diabetic patients (type 1 and 2) starting active treatment of terminal renal failure from 1990 to 2003

Renal Diagnoses 2003

Age Renal diagnosis	0-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	All
ESRD,unknown causes	1	2	6	7	18	35	55	15	139
Glomerulonephritis	2	9	5	17	12	16	7	3	71
Pyelo/interst. Nephritis	1	5	8	8	16	17	19	5	79
Cystic renal disease	0	0	1	9	14	9	10	2	45
Alport disease	0	2	0	0	0	0	0	0	2
Other heriditary disease	0	0	0	0	0	0	0	0	0
Renal hypoplasia	2	2	0	0	0	0	0	0	0
Renal vascular disease	0	2	1	8	15	31	39	14	110
Renal vasculitis	0	0	0	0	2	10	5	1	18
Diabetes (IDDM)	0	8	11	18	14	12	10	1	74
Diabetes (NIDDM)	0	0	0	1	10	29	32	10	82
Systemic disease	2	2	3	4	7	8	5	1	32
Other renal diseases	1	0	0	2	6	17	13	7	4
Sum	**9**	**32**	**35**	**74**	**114**	**184**	**195**	**59**	**702**

Table 5. Renal diagnosis in patients starting treatment for ESRD in 2003. The patients are stratified according to age.

Renal Diagnoses 1990 - 2003

Year Renal diagnosis	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	SUM
ESRD,unknown causes	55	61	62	81	76	82	103	110	105	131	134	136	142	139	1417
Glomerulonephritis	57	68	67	81	69	82	74	72	85	99	82	86	66	71	1059
Pyelo/interst. Nephritis	45	59	57	76	59	67	58	72	81	78	92	83	74	79	980
Cystic renal disease	43	33	30	47	34	43	37	40	45	47	44	53	41	45	582
Alport disease	4	3	2	2	2	1	4	2	1	0	3	2	3	2	31
Other heriditary disease	4	3	2	4	1	6	2	4	4	3	2	6	2	0	43
Renal hypoplasia	1	6	1	6	4	4	1	3	6	3	3	5	2	4	49
Renal vascular disease	34	44	36	57	60	68	58	58	79	85	95	95	110	110	989
Renal vasculitis	5	3	0	6	10	13	17	15	12	16	16	12	13	18	156
Diabetes (IDDM)	52	53	63	76	69	73	73	65	79	95	77	85	85	74	1019
Diabetes (NIDDM)	6	13	9	23	24	40	41	43	37	50	73	83	98	82	622
Systemic disease	20	13	26	18	24	22	33	34	32	36	43	39	32	32	404
Other renal diseases	4	6	5	15	13	7	9	21	21	10	35	68	30	46	290
Sum	**330**	**365**	**360**	**492**	**445**	**508**	**510**	**539**	**587**	**653**	**699**	**753**	**698**	**702**	**7641**

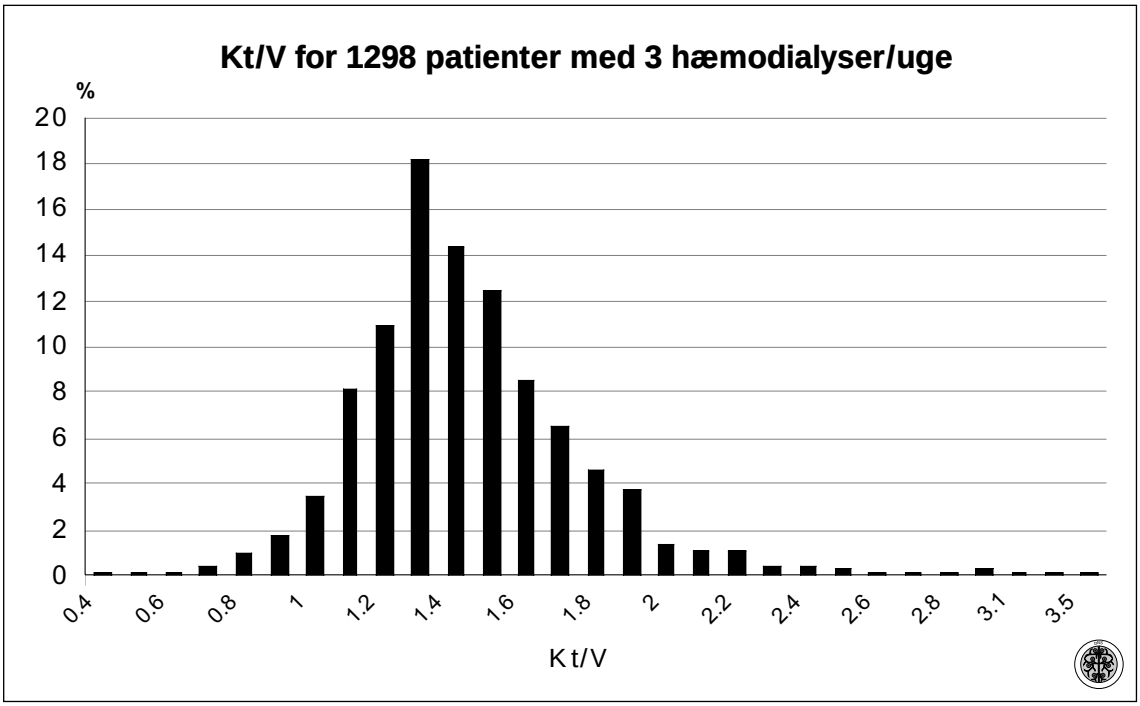
Table 6. Renal diagnoses in patients starting treatment 1990 - 2003.

Hemodialysis – quality control

Data for årets sidste Kt/V-måling fra 1439 hæmodialysepatienter

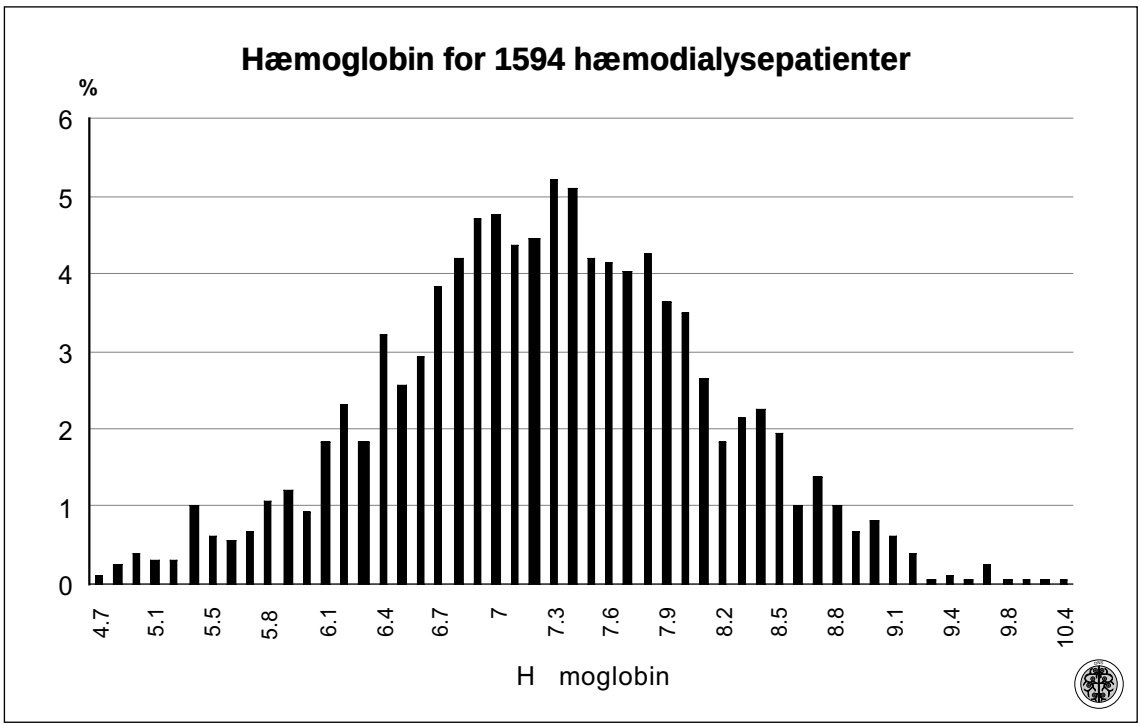
Dialyser/uge	1	2	3	4	5
Antal patienter	10	100	1298	19	12
Kt/V gennemsnit	1,54	1,70	1,43	1,28	1,07

Table 7 shows average values for Kt/V in patients treated with 1-5 dialysis per week. Most patients are dialyses 3 times a week.



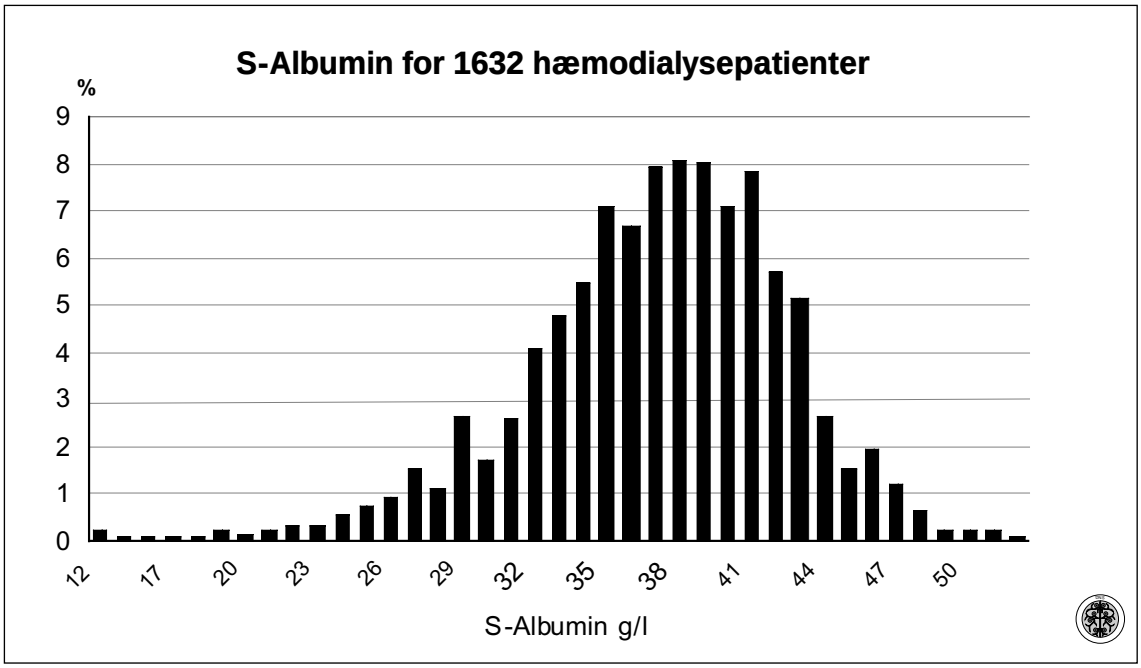
Kt/V ≥ 1,2 var opnået for 85% (82% af mændene og 89% af kvinderne).

Fig. 14 shows Kt/V in 1298 patients with 3 hemodialysis per week. Kt/V >= 1.2 was found in 85% (men 82%, women 89%).



83% havde hæmoglobin ≥ 6,5 mmol/l (84% af mændene og 82% af kvinderne).

Fig. 15 shows hemoglobin in 1594 HD patients. Hemoglobin >= 6.5 was found in 83% (men 84%, women 82%)



72% havde S-Albumin ≥ 35 g/l (74% af mændene og 70% af kvinderne).

Fig. 16 shows S-albumin in 1632 HD patients. 72% had S-albumin >= 35g/l (men 74%, women 70%)

Renal Transplantation 2003

Renal transplantation 2003									
	Cadaver kidney				Living donor kidney				
Center	1	2	3	4	1	2	3	4	***Sum***
Skejby	38	13	2	0	9	0	0	0	62
RH	27	8	1	0	13	0	1	0	50
Odense	23	4	1	0	10	0	1	0	39
Herlev	10	2	0	0	12	0	1	0	25
Total	98	27	4	0	44	0	3	0	176

Table 8. Renal transplantations 2003, stratified according to source of donor organ, transplantation number (1-4) and transplantation center

Renal transplantation 1991 - 2003

Renal transplantation 1991 - 2003									
	Cadaver kidney				Living donor kidney				
Year	1	2	3	4	1	2	3	4	***Sum***
1991	98	25	7	0	25	9	1	2	167
1992	115	32	7	1	33	8	3	0	199
1993	121	25	9	0	39	7	3	0	204
1994	98	26	7	4	53	6	1	1	196
1995	94	10	8	0	35	6	1	0	154
1996	105	22	7	0	44	1	0	0	179
1997	89	19	5	1	42	3	0	1	160
1998	78	23	4	2	36	1	0	0	144
1999	96	19	10	1	37	5	0	0	168
2000	98	16	7	0	27	5	0	0	153
2001	95	23	4	0	33	6	1	0	162
2002	102	26	3	1	38	1	0	0	171
2003	98	27	4	0	44	0	3	0	176

Table 9. Renal transplantations 1991 – 2003, stratified according to source of donor organ, transplantation number (1-4) and year of transplantation.

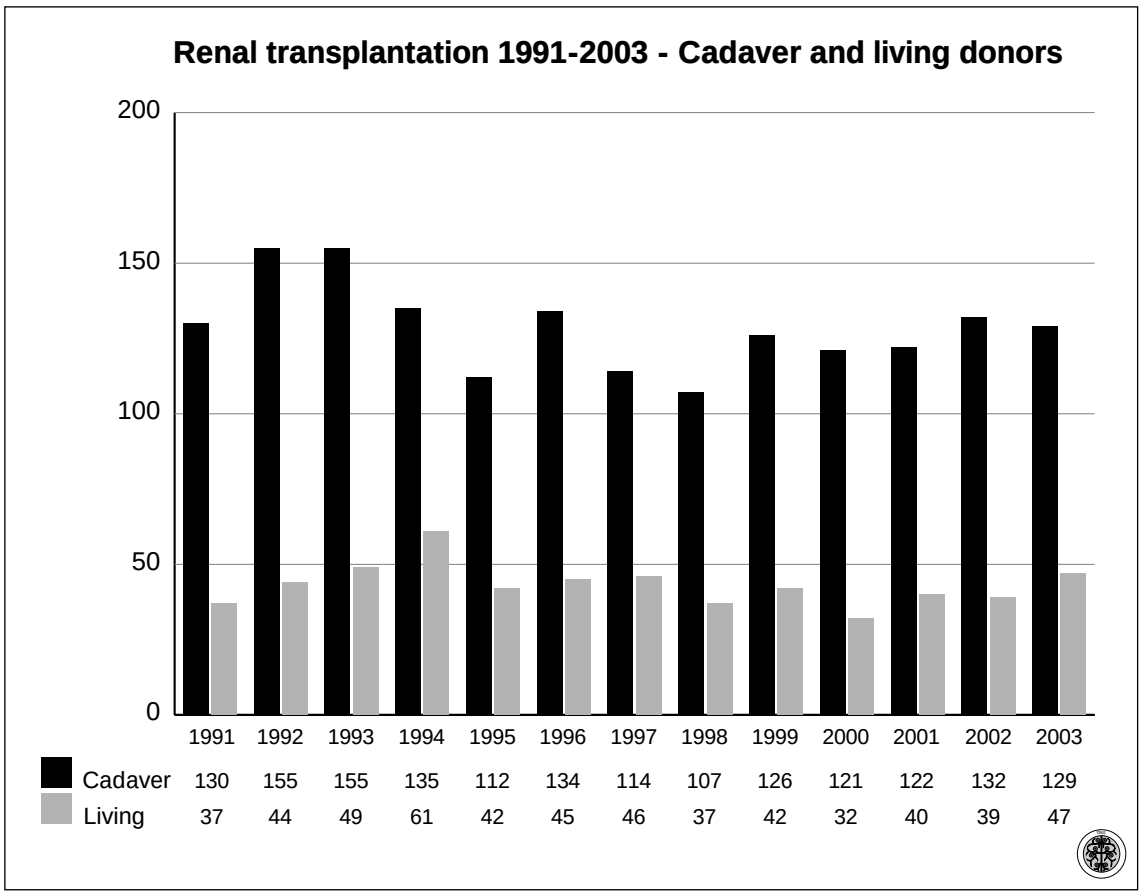

Renal transplantation 1991-2003 - Cadaver and living donors
200
150
100
50
0
1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003
Cadaver 130 155 155 135 112 134 114 107 126 121 122 132 129
Living 37 44 49 61 42 45 46 37 42 32 40 39 47

Fig. 17

Living donor-relation between donor and recipient

Year	Parents	Siblings				Other related	Unre-lated	Sum
		Shared haplotypes			Ident. Twins			
		2	1	0				
1991	16	12	8	0	0	1	0	37
1992	27	6	4	1	0	4	2	44
1993	20	10	7	1	1	7	3	49
1994	31	10	12	2	1	3	2	61
1995	26	4	4	0	0	5	3	42
1996	29	3	6	2	1	1	3	45
1997	26	12	6	0	1	0	1	46
1998	17	8	10	0	0	0	2	37
1999	26	2	4	2	0	5	3	42
2000	18	5	5	0	0	1	3	32
2001	13	4	11	2	0	5	5	40
2002	23	4	4	0	0	2	6	39
2003	22	2	6	2	0	6	9	47

Table 10. Transplantation with living donor kidneys 1991 - 2003. Stratified according to donor-recipient relationship and year of transplantation.

Transplantation follow-up centres in 2003

Center	No	Center	No.
Esbjerg	6	Rigshospitalet	450
Fredericia	45	Roskilde	27
Herlev	249	Rønne	0
Hillerød	1		
Holbæk	14	Sønderb.	2
Holstebro	58	Viborg	61
Nykøbing F	0	Aalborg	109
Odense	244	Skejby	292

Table 11. The distribution of ambulatory follow up of 1558 Danish renal transplant patients in 15 nephrological centres. It can be seen that most nephrological centres are involved in controlling stable renal transplant patients. The four transplantation centres are marked.

Transplantation in foreign countries

Year	Number	No. Different Centres
1990	1	1
1991	1	1
1992	0	
1993	3	2
1994	1	1
1995	1	1
1996	0	
1997	2	2
1998	4	2
1999	4	4
2000	3	3
2001	4	3
2002	2	2
2003	7	4
Total number	33	I alt fra 10 forskellige centre

Table 12 shows, that 33 patients dialysed in 10 different Danish centres, have received kidney transplantation in other countries during a period of 13 years.

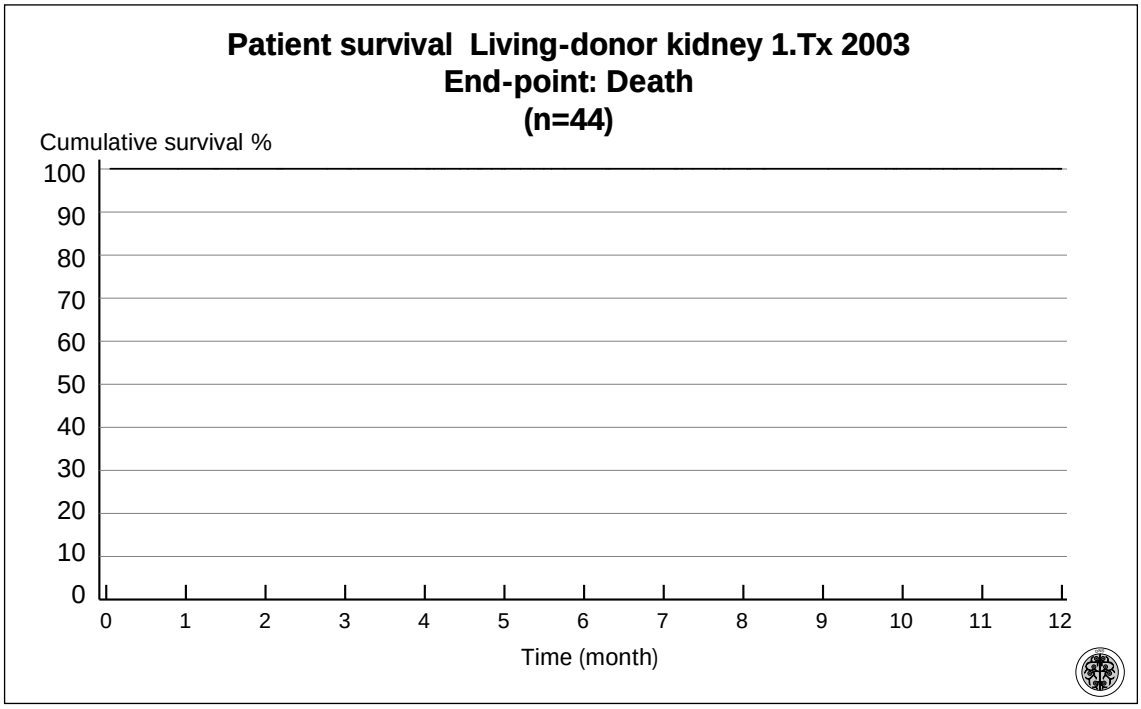

Patient survival Living-donor kidney 1.Tx 2003
End-point: Death
(n=44)
Cumulative survival %
100
90
80
70
60
50
40
30
20
10
0
0 1 2 3 4 5 6 7 8 9 10 11 12
Time (month)

Fig. 18.

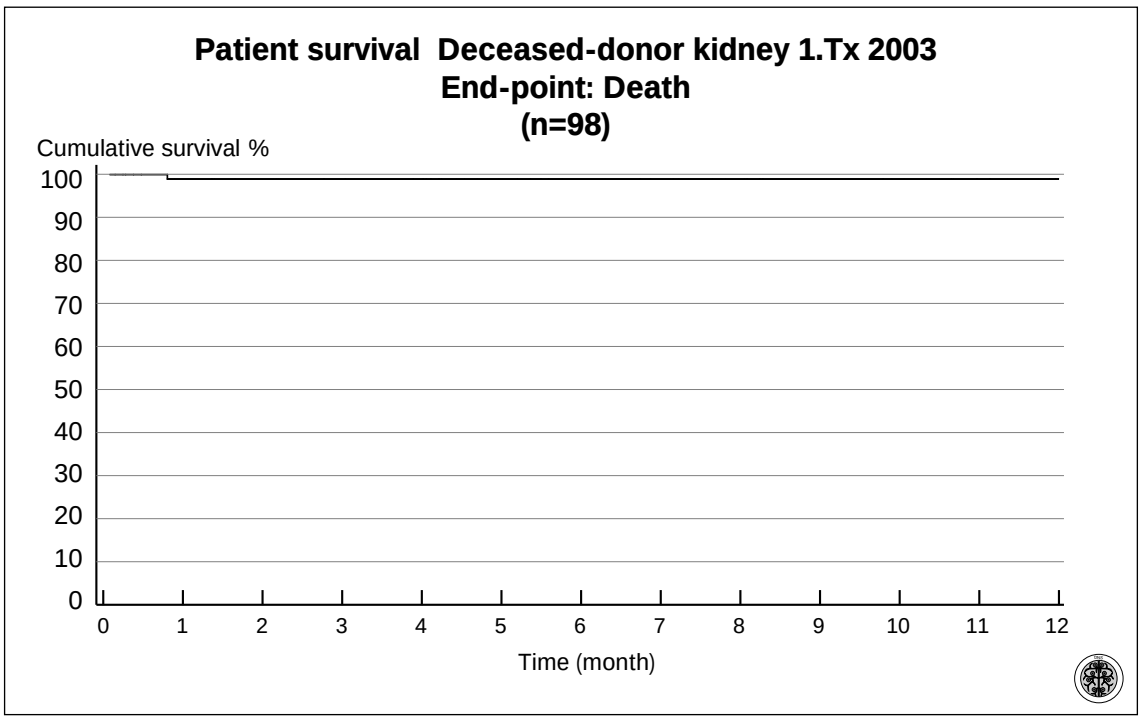

Patient survival Deceased-donor kidney 1.Tx 2003
End-point: Death
(n=98)
Cumulative survival %
100
90
80
70
60
50
40
30
20
10
0
0 1 2 3 4 5 6 7 8 9 10 11 12
Time (month)

Fig. 19.

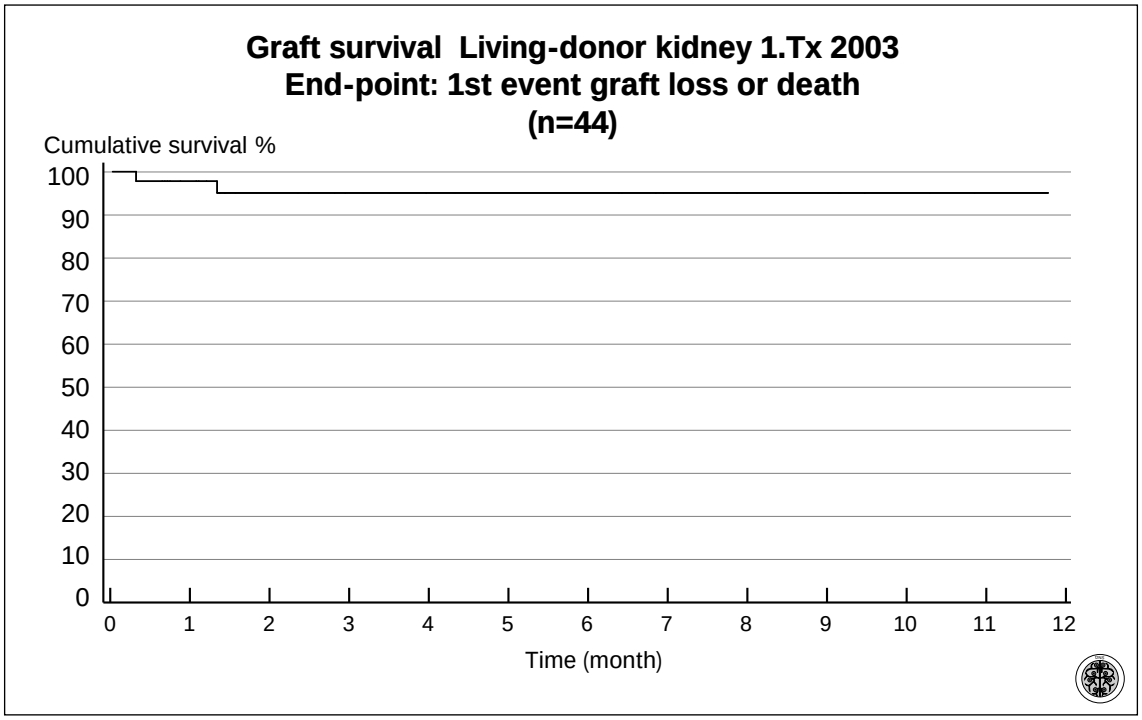

Graft survival Living-donor kidney 1.Tx 2003
End-point: 1st event graft loss or death
(n=44)
Cumulative survival %
100
90
80
70
60
50
40
30
20
10
0
0 1 2 3 4 5 6 7 8 9 10 11 12
Time (month)

Fig. 20.

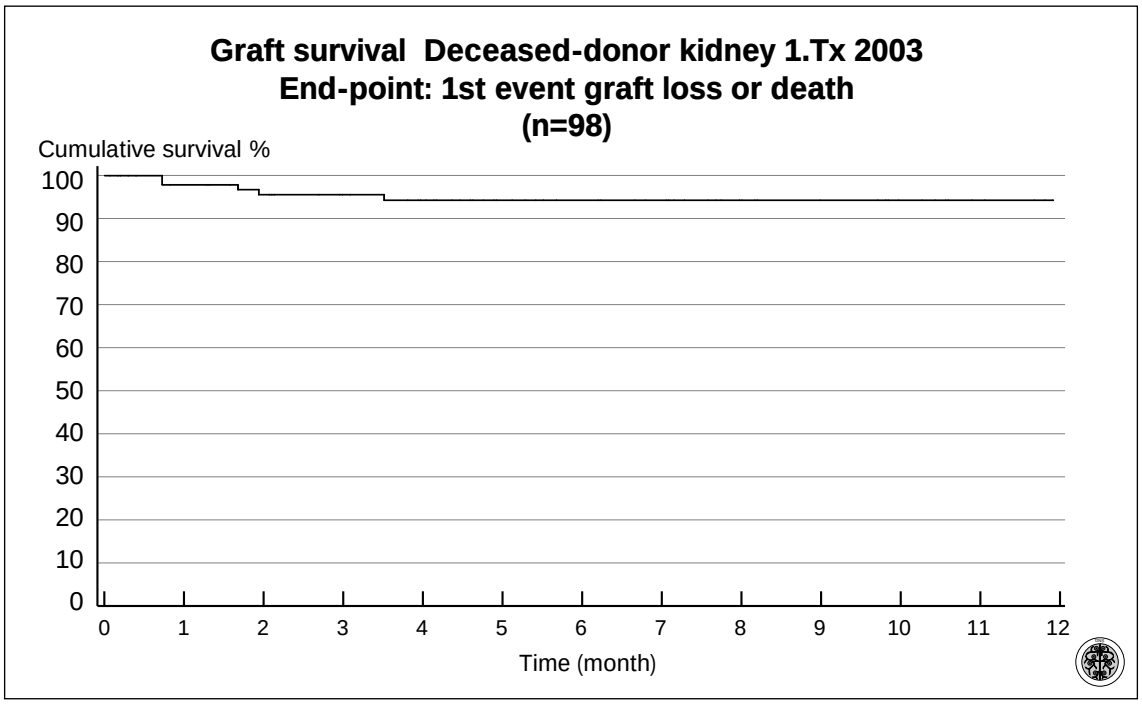

Graft survival Deceased-donor kidney 1.Tx 2003
End-point: 1st event graft loss or death
(n=98)
Cumulative survival %
100
90
80
70
60
50
40
30
20
10
0
0 1 2 3 4 5 6 7 8 9 10 11 12
Time (month)

Fig. 21.

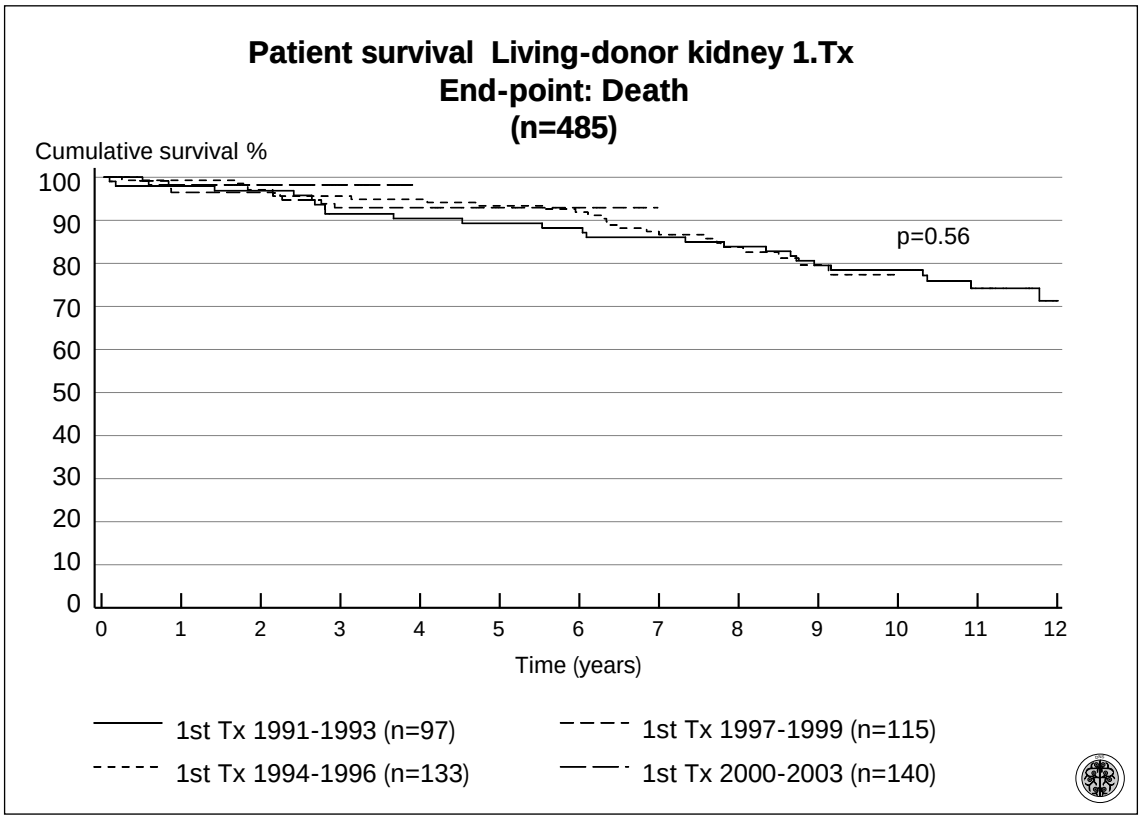

Patient survival Living-donor kidney 1.Tx
End-point: Death
(n=485)
Cumulative survival %
100
90
80
70
60
50
40
30
20
10
0
0 1 2 3 4 5 6 7 8 9 10 11 12
Time (years)
p=0.56
1st Tx 1991-1993 (n=97)
1st Tx 1994-1996 (n=133)
1st Tx 1997-1999 (n=115)
1st Tx 2000-2003 (n=140)

Fig. 22.

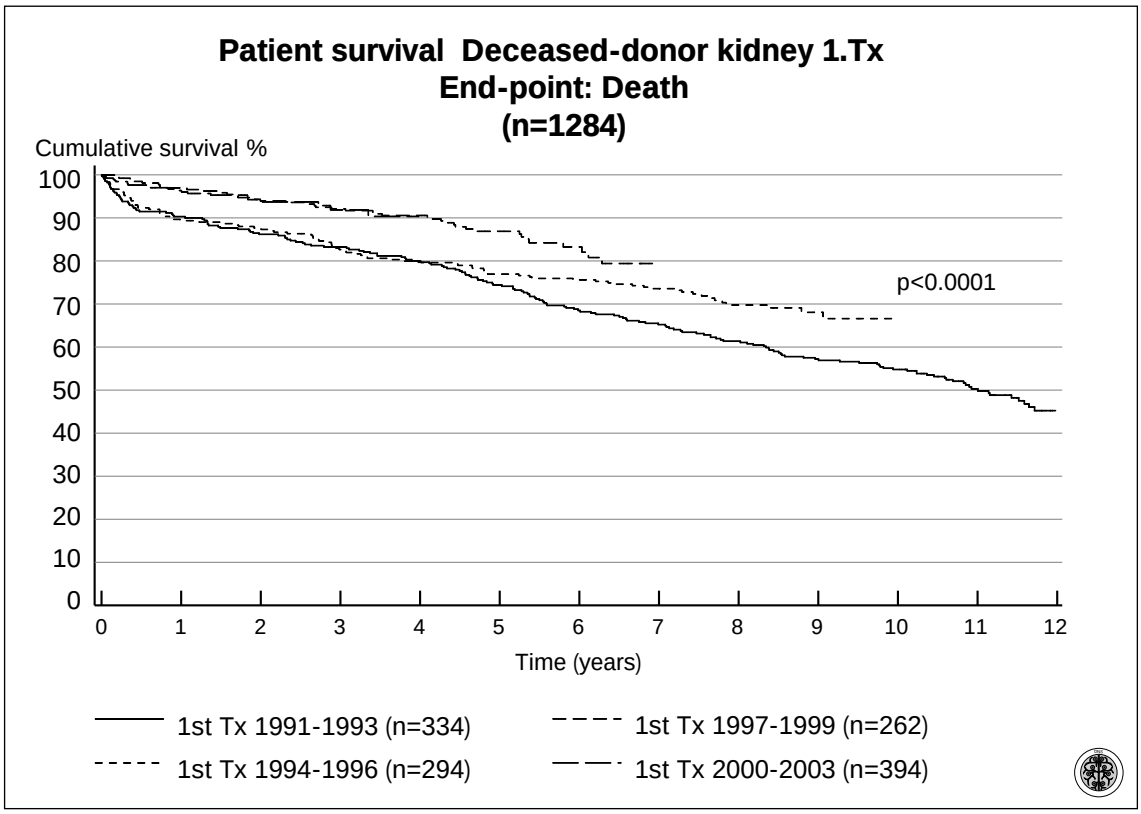

Patient survival Deceased-donor kidney 1.Tx
End-point: Death
(n=1284)
Cumulative survival %
100
90
80
70
60
50
40
30
20
10
0
0 1 2 3 4 5 6 7 8 9 10 11 12
Time (years)
p<0.0001
1st Tx 1991-1993 (n=334)
1st Tx 1994-1996 (n=294)
1st Tx 1997-1999 (n=262)
1st Tx 2000-2003 (n=394)

Fig. 23.

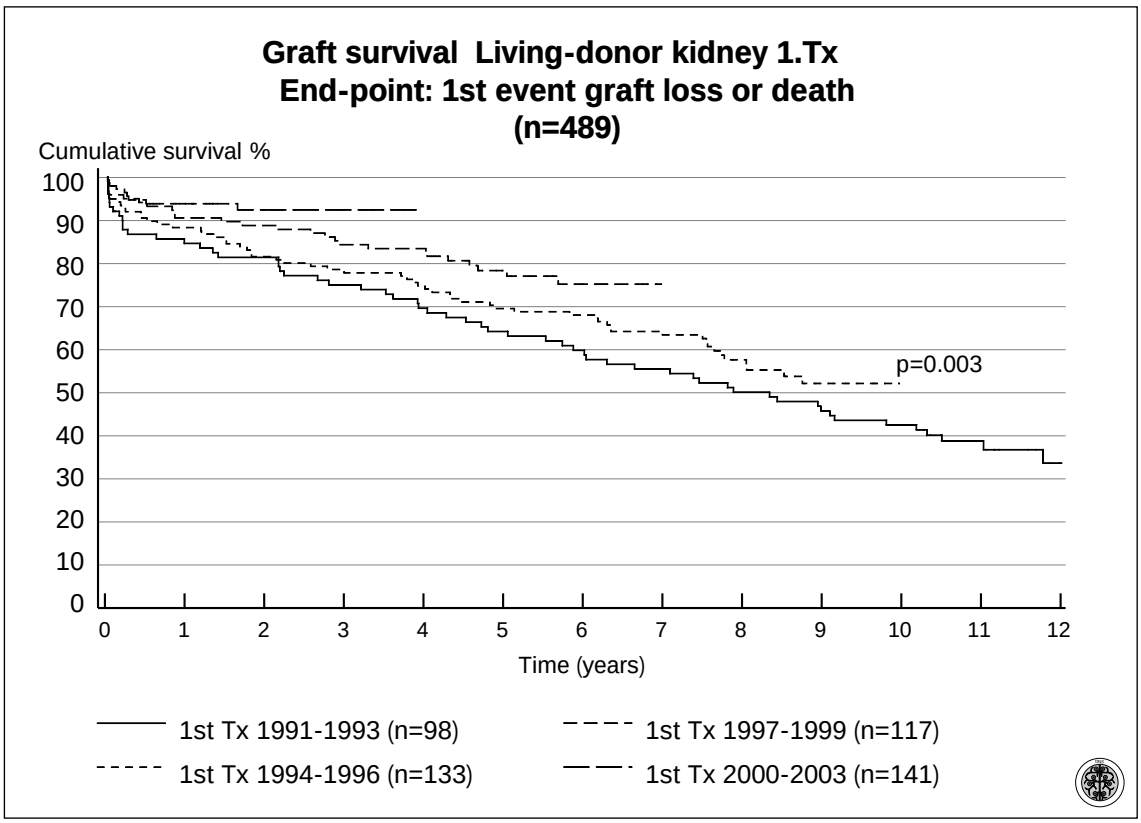

Graft survival Living-donor kidney 1.Tx
End-point: 1st event graft loss or death
(n=489)
Cumulative survival %
100
90
80
70
60
50
40
30
20
10
0
0 1 2 3 4 5 6 7 8 9 10 11 12
Time (years)
p=0.003
1st Tx 1991-1993 (n=98)
1st Tx 1994-1996 (n=133)
1st Tx 1997-1999 (n=117)
1st Tx 2000-2003 (n=141)

Fig. 24.

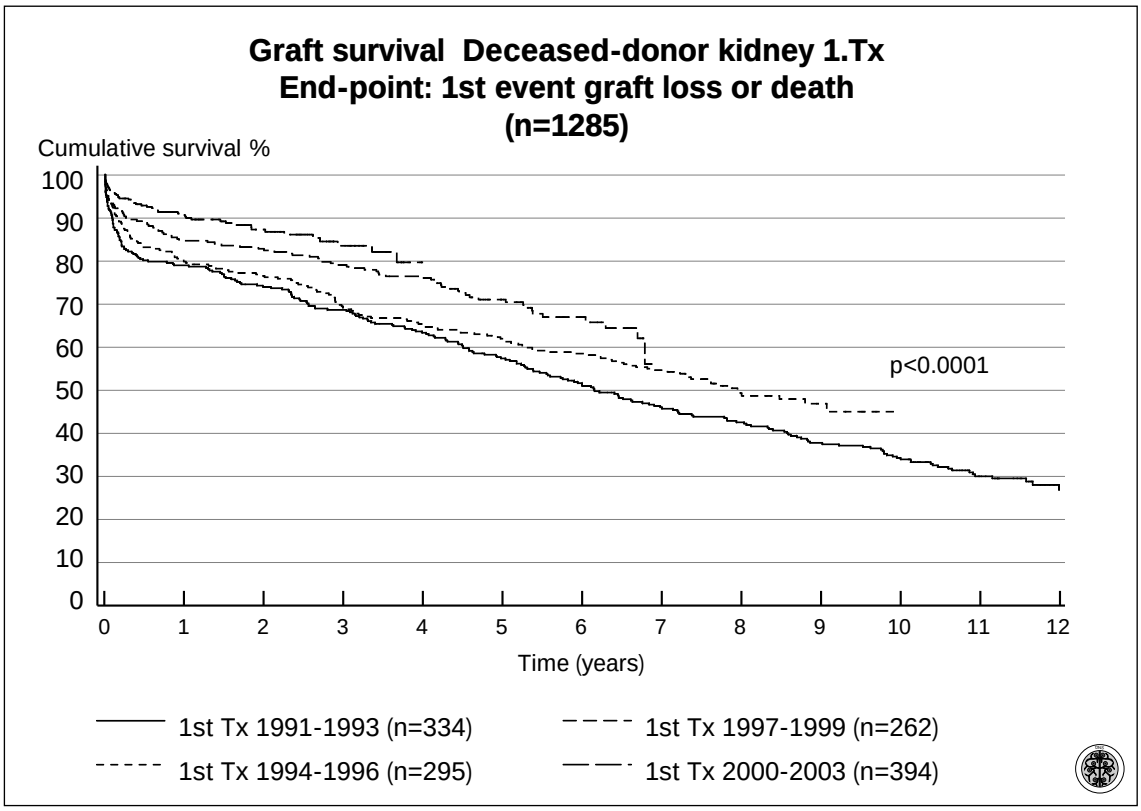

Graft survival Deceased-donor kidney 1.Tx
End-point: 1st event graft loss or death
(n=1285)
Cumulative survival %
100
90
80
70
60
50
40
30
20
10
0
0 1 2 3 4 5 6 7 8 9 10 11 12
Time (years)
p<0.0001
1st Tx 1991-1993 (n=334)
1st Tx 1994-1996 (n=295)
1st Tx 1997-1999 (n=262)
1st Tx 2000-2003 (n=394)

Fig. 25.

Tissue Types. Number of mismatches on HLA, A, B and DR

Year	DR mismatches	B mismatch	A mis	1994	1995	1996	1997	1998	1999	2000	2001	2002	Sum
	0	0	0	9	7	6	24	15	12	15	7	12	107
			1	3	3	3	4	1	3	1	4	3	25
			2			1					1	1	3
		1	0	1	7	8	5	4	5	5	4	4	43
			1	7	12	17	9	12	7	10	13	13	100
			2	2		1	4	2		5	7	1	22
		2	0	2	4	1	1	1	1		4	3	17
			1	5	6	5	5	8	5	11	8	7	60
			2	2	3	4	6	7	1	3	4	9	39
	1	0	0	1	5	2	6	5	3	2	5	3	32
			1	2	6	6	9	4	3	5	11	11	57
			2	1	1	1	1	1				1	6
		1	0	7	15	16	12	13	22	18	13	12	128
			1	14	26	30	22	29	51	32	32	28	264
			2	1	1	7	5	2	5	6	3	5	35
		2	0		5	3	2	4	3	2	7	8	34
			1	6	6	9	12	13	19	18	6	16	105
			2	3	9	10	4	5	2	2	4	3	42
	2	0	0	1	1		1	1	1			1	6
			1	2			1						3
			2		1						1		
		1	0	1	2	4	2	1	7	2	1	1	20
			1	2	2	4	7	3	2	2	6	2	30
			2	4	3	1	2	1	1	1	1	2	16
		2	0	1	1	2	1	3	2	1		2	13
			1	1	5	11	5	3	6	2	2	2	37
			2	4	4	2	3	4	2	1	2		22
	Total number of TX			82	134	154	154	142	163	144	144	150	1267

Table 13

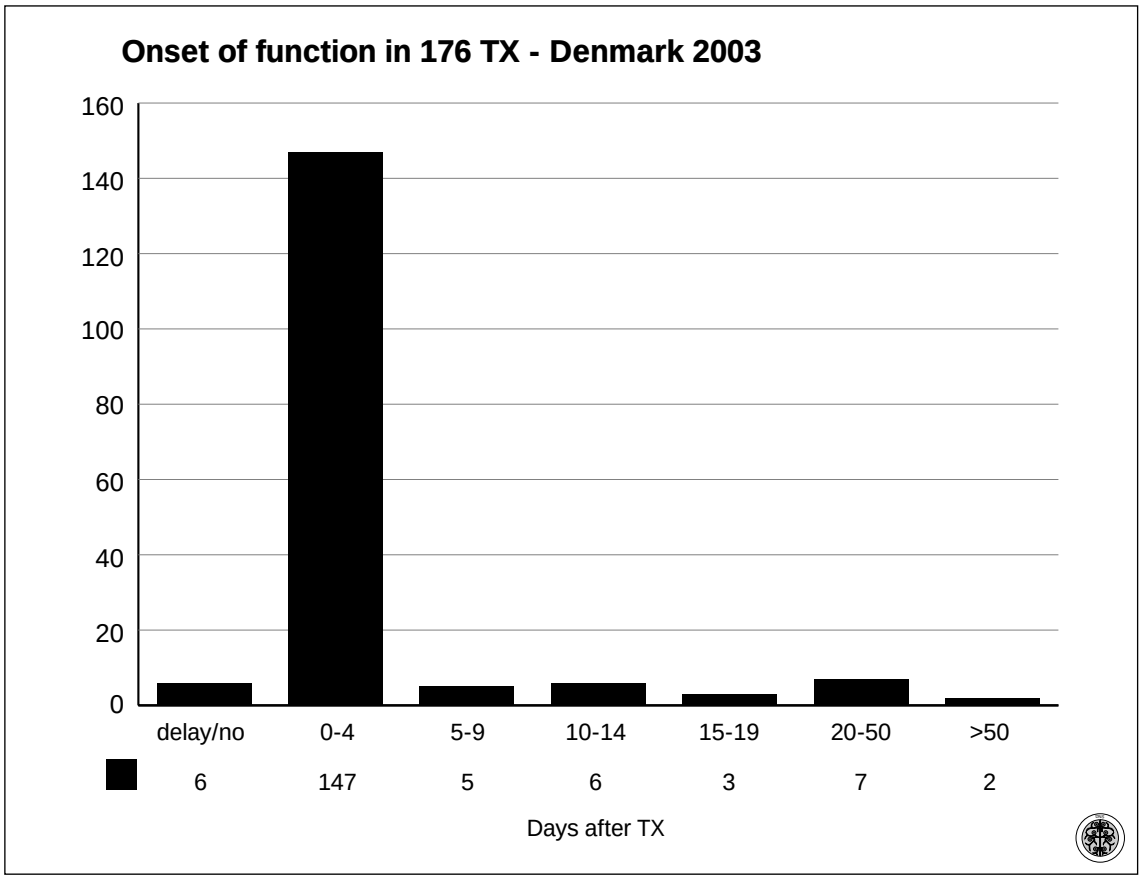


Fig. 26 shows onset of function in 176 patients transplanted in Denmark 2003. Most kidneys functioned within the first week. Six kidneys didn't function at the end of the year, either due to never functioning or postponed renal function.

Causes of death

Causes of death 2003					
	Hemodialysis	P-dialysis	HD+PD	Renal-Tx	Sum
Cardiac	121	26	1	4	152
Vascular	53	11		6	70
Infection	87	15	1	2	105
Malignancy	38	6		9	53
Other causes	108	11		21	140
Sum	407	69	2	42	520

Table 14. Causes of death in 520 patients who died in 2003. Cardiac includes acute myocardial infarction, hyper- and hypokalaemia, hypertensive heart failure, fluid overload and cardiac arrest of unknown cause. Vascular causes includes mainly cerebrovascular disease. Infection includes all bacterial and viral diseases.

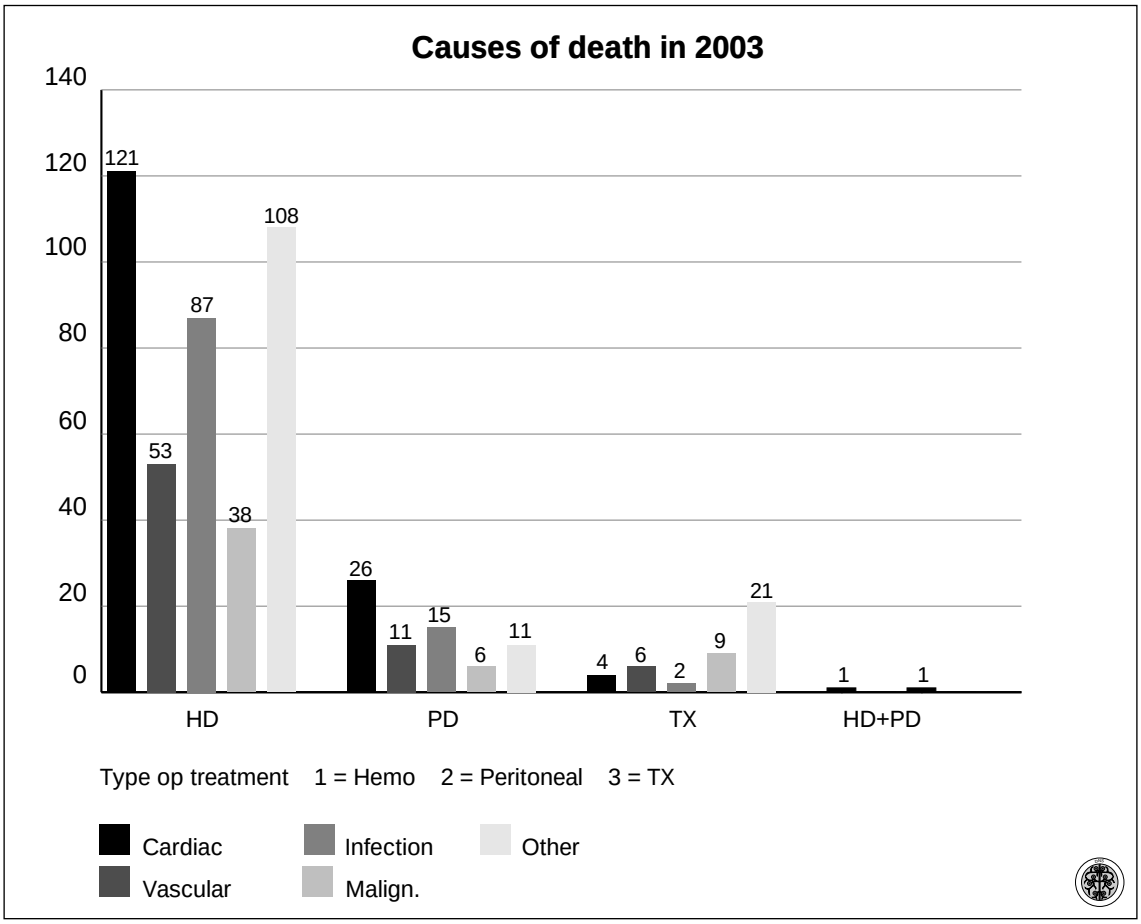


Fig. 27. Causes of death in 520 patients who died during 2003.

Death rate for 2003

Method of calculation:
Death rate = number of death x 100 / Person - years of observation.
All patients included from the start of active treatment.

Hemodialysis:

	Number
Dead	407
Number of patients treated in 2002	2401
Average number of days in treatment	274
Number of person years	1800

Death rate in 100 person years **22,6**

Peritoneal dialysis:

	Number
Dead	71
Number of patients treated in 2002	900
Average number of days in treatment	252
Number of person years	621

Death rate in 100 person years **11,4**

Transplantation:

	Number
Dead	42
Number of patients treated in 2002	1650
Average number of days in treatment	335
Number of person years	1513

Death rate in 100 person years **2,8**

Death rate from 1991 - 2002

Year	Hemodialysis	Peritoneal dialysis	Transplantation
	Death rate expressed in number per 100 person years		
1991	20.6	13.4	3.9
1992	22.2	19.6	4.9
1993	26.5	16.0	4.3
1994	23.8	18.6	4.3
1995	27.2	17.8	4.4
1996	25.6	13.6	3.0
1997	24.5	14.9	4.7
1998	24.5	17.8	2.9
1999	23.2	13.8	3.4
2000	25.2	15.4	2.6
2001	23.3	13.5	3.2
2002	23.4	11.9	2.9
2003	22.6	11.4	2.8

Table 15 shows the variation in death rate during the last 13 years expressed in *number of death per 100 person years*.

Danish and US Dialysis Patient Survival

James Heaf

Introduction

The DNSL database has consistently showed higher survival rates for dialysis patients compared to the USRDS database. However, a re-analysis of the database in 2003, using a different statistical method and correcting previous registration errors, seemed to reveal equivalent survival rates. Adjusted death rates in the US have indeed fallen substantially during the past few years from 25.3 %/yr in 1988 to 21.2 %/yr in 2001. However, there are a number of reasons why survival rates cannot be compared directly:

1) Differences in renal diagnosis and age. The USRDS has a higher proportion of elderly patients and patients with diabetes.
2) Differences in race. The DNSL contains mainly Caucasian patients, while the USRDS contains a large proportion of Black, Indian and Asian patients, who have a generally better prognosis.
3) The method of adjustment is not publicly available
4) Death rates are higher during the first 90 days of dialysis (in Denmark 40%/yr). The USRDS only studies deaths occurring after 90 days.
5) The DNSL publishes results for all treatments, while the USRDS contains only first treatments. For instance, patients returning to dialysis after a failed transplant are not included.
6) A number of other subtle differences exist; for instance, treatments of less than 60 days duration are “collapsed”, i.e. merged with the previous or subsequent treatment modality in the USRDS.

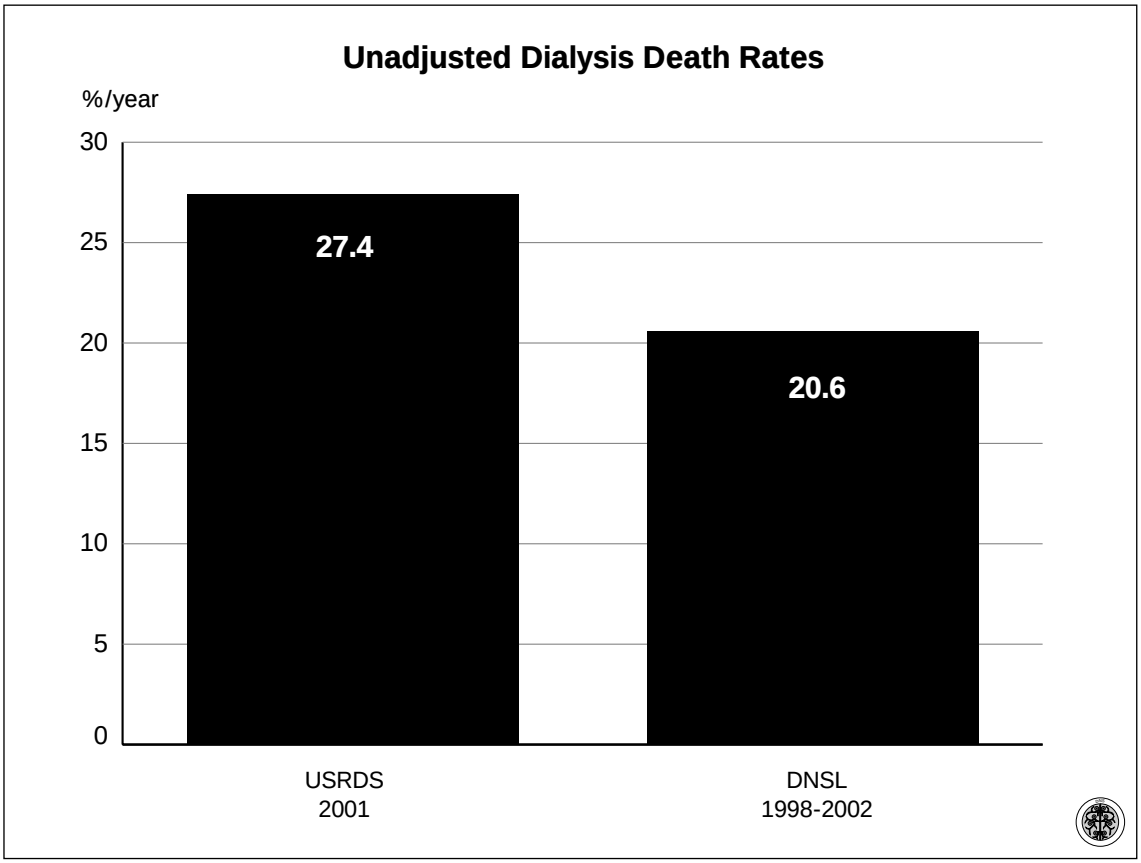
In the following comparison, Danish dialysis patient survival after 90 days for the years 1998-2002 are compared with the unadjusted death rates for White US patients in 2001. First treatments only are included.

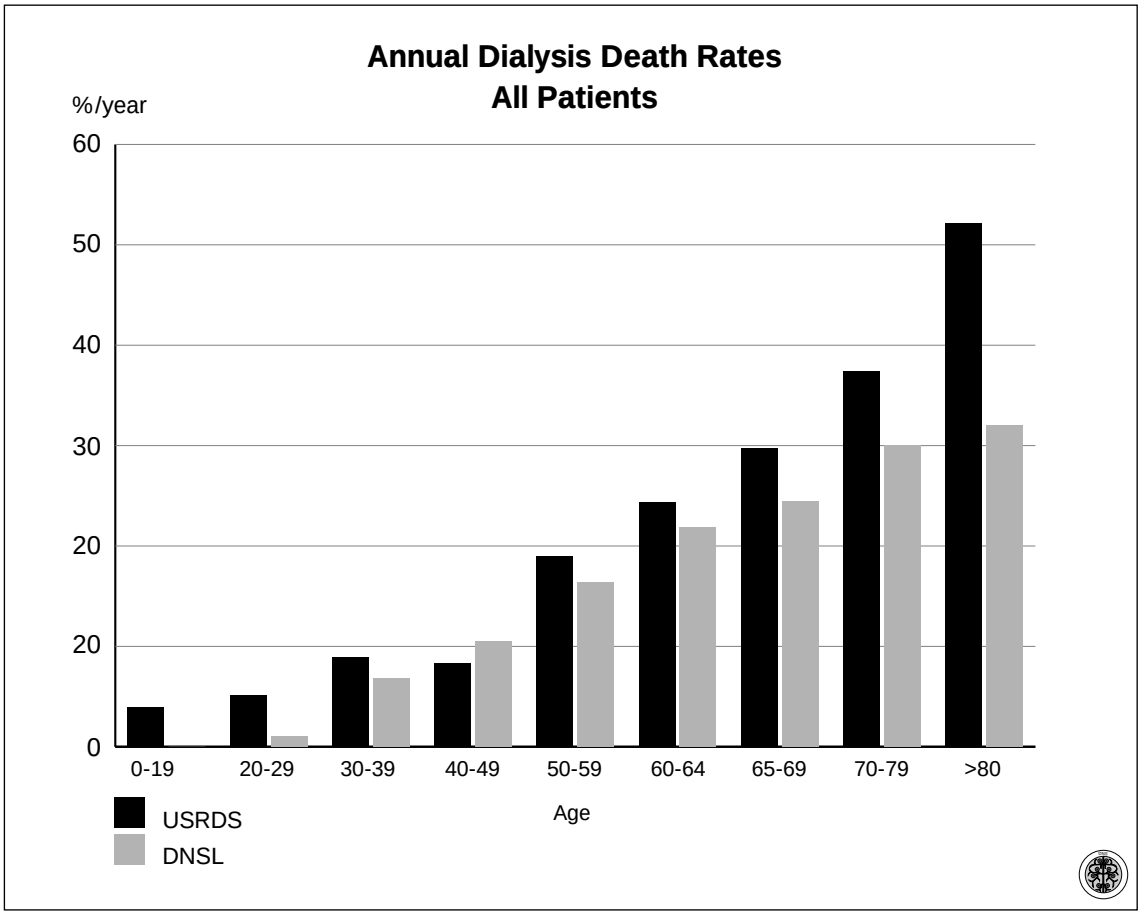
Changes in Survival 1990-2002

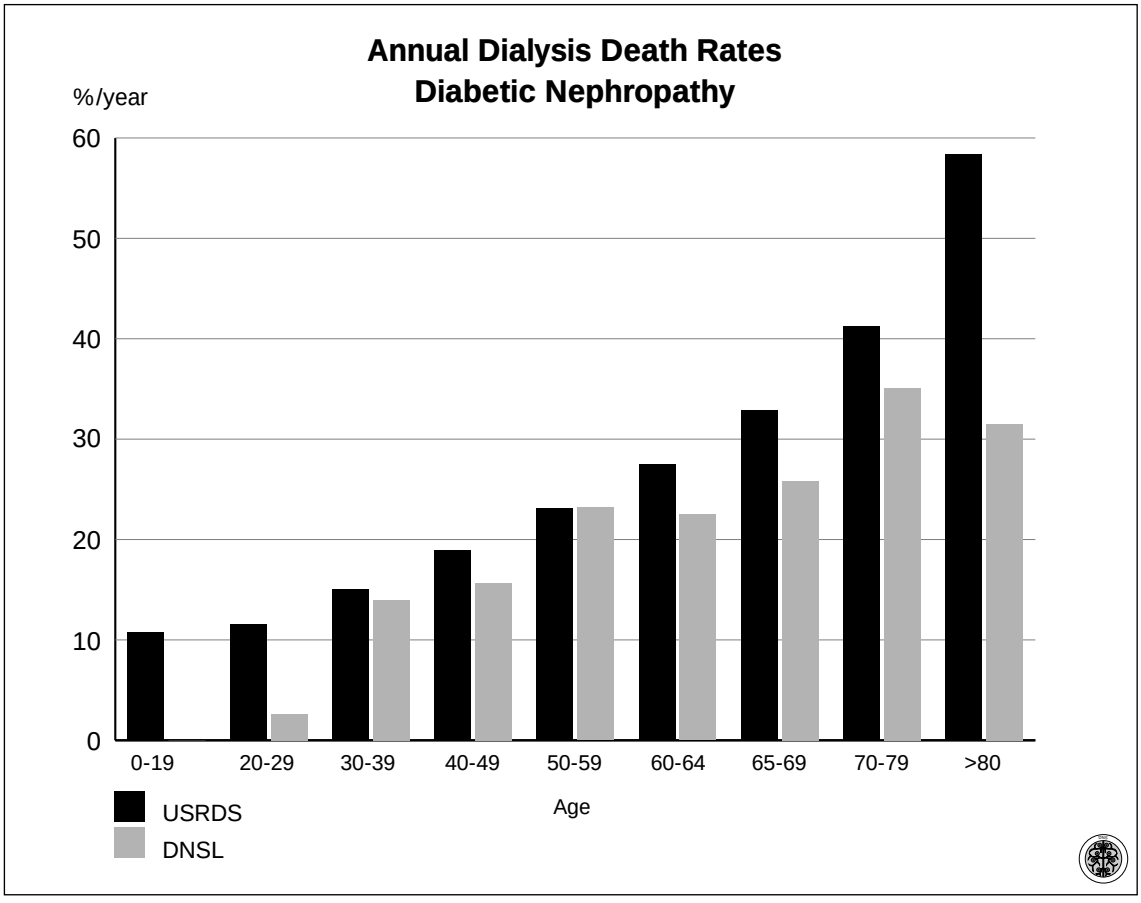
The relatively small number of patients in the DNSL does not permit a detailed analysis of changes in survival rates over time. During this period, substantial changes in the dialysis population have occurred with and increasing proportion of elderly patients and patients with diabetic nephropathy and other multiple comorbidity. It is however probable that selection criteria for patients with primary renal disease age 20-65 have remained unchanged. The death rate for these patients was unchanged 1990-1997 at 12.4%/yr. In 1998-2002 the rate fell to 9.2 %/yr ($p<0.01$).

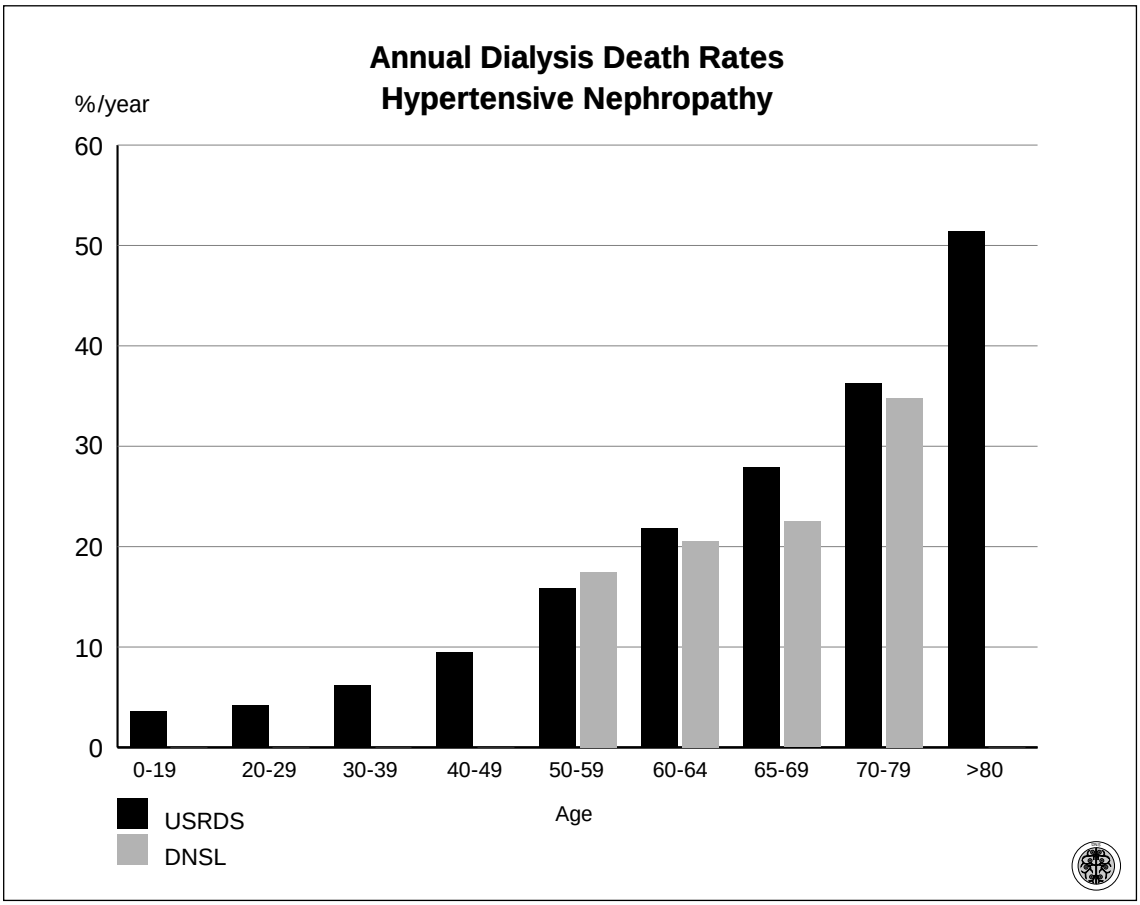
USRDS: Methodological Differences

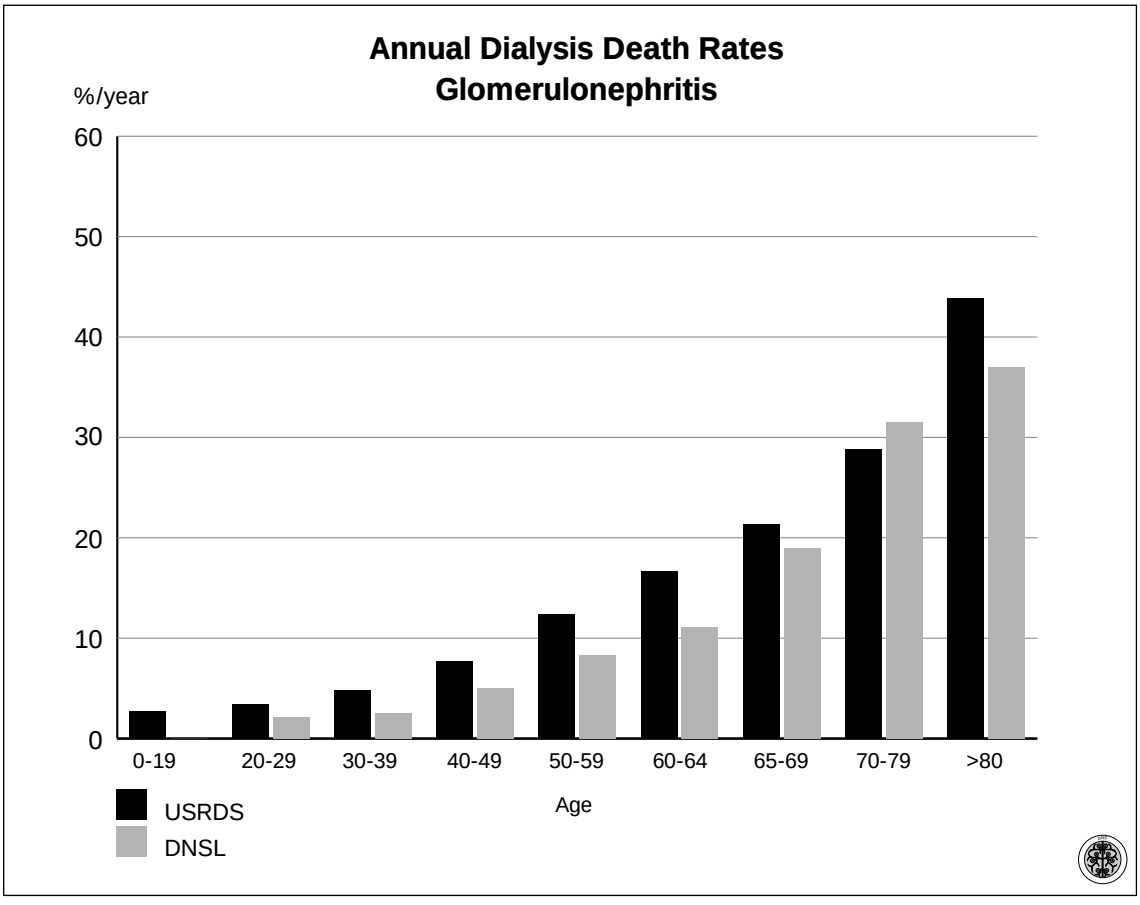
- First 90 days excluded
- First Treatment only
- More diabetes
- Older patients
- More non-Caucasians
- Method of adjustment not public
- 60-day “collapsing” rule

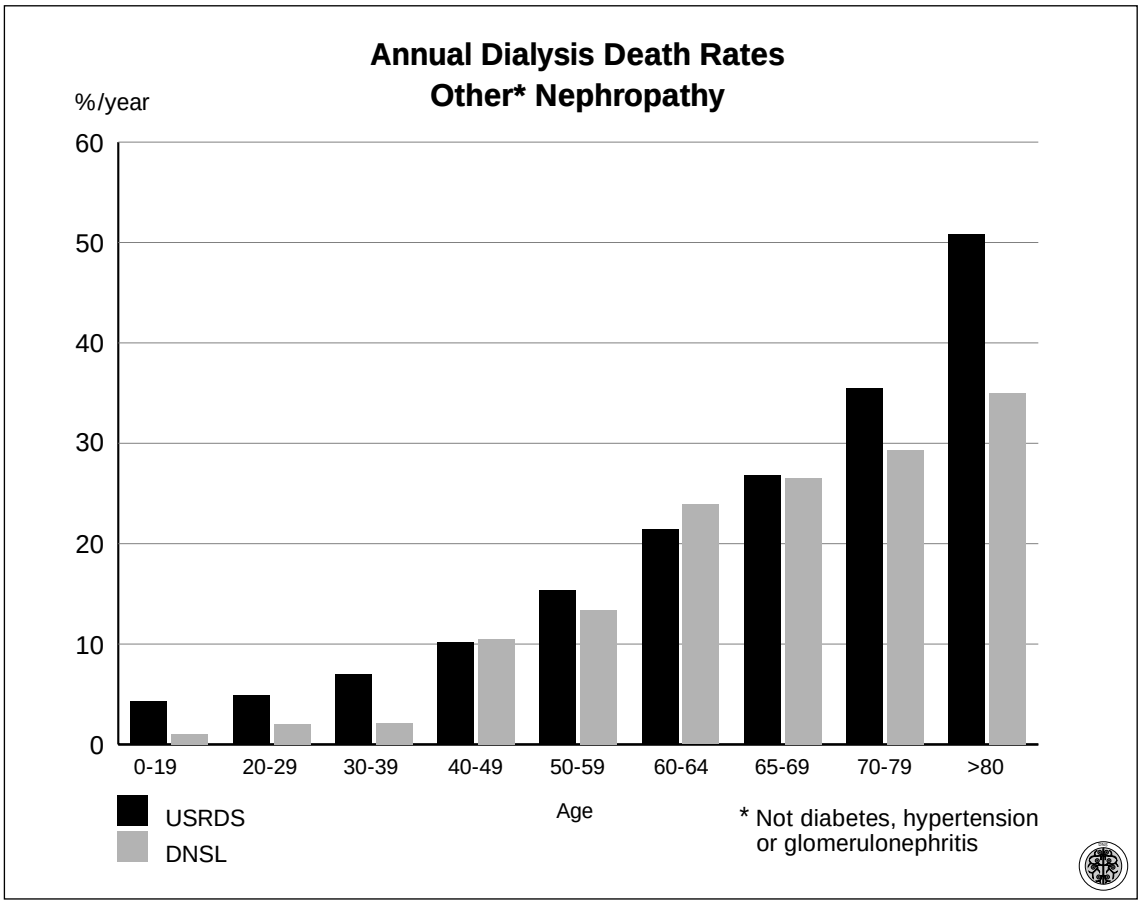


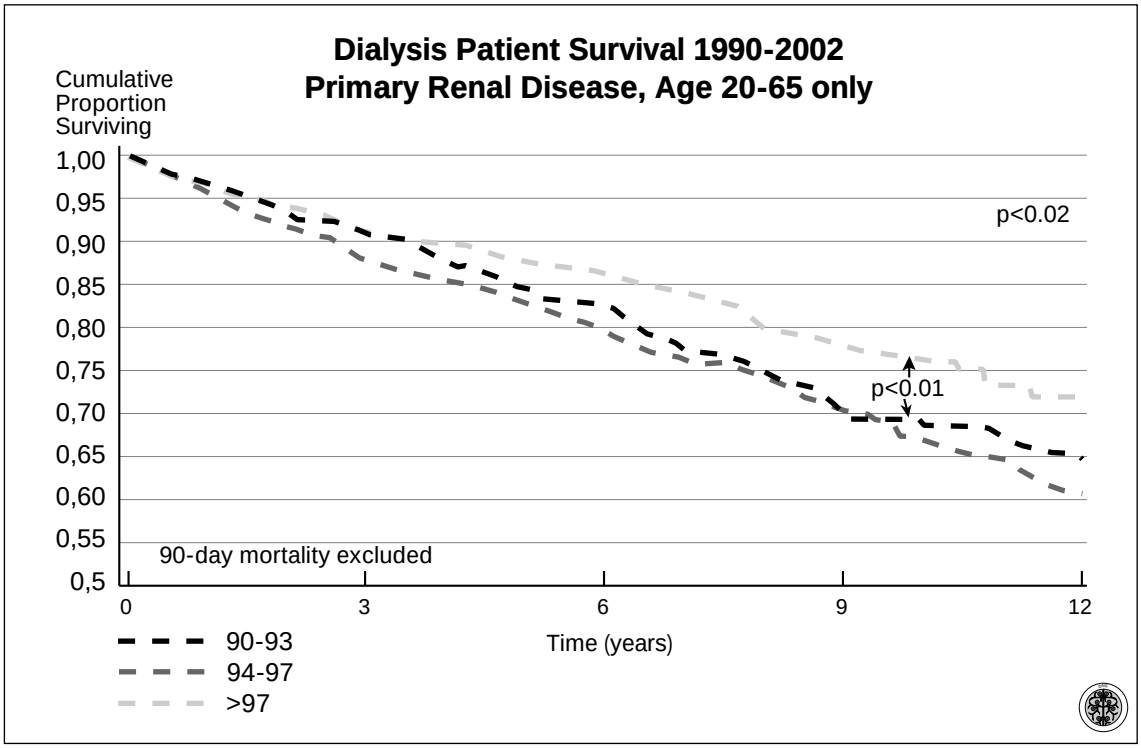

Annual Dialysis Death Rates
All Patients
%/year
60
50
40
30
20
20
0
0-19
20-29
30-39
40-49
50-59
60-64
65-69
70-79
>80
Age
USRDS
DNSL


Annual Dialysis Death Rates
Diabetic Nephropathy
%/year
60
50
40
30
20
10
0
0-19
20-29
30-39
40-49
50-59
60-64
65-69
70-79
>80
Age
USRDS
DNSL


Annual Dialysis Death Rates
Hypertensive Nephropathy
%/year
60
50
40
30
20
10
0
0-19
20-29
30-39
40-49
50-59
60-64
65-69
70-79
>80
Age
USRDS
DNSL


Annual Dialysis Death Rates
Glomerulonephritis
%/year
60
50
40
30
20
10
0
0-19
20-29
30-39
40-49
50-59
60-64
65-69
70-79
>80
Age
USRDS
DNSL


Annual Dialysis Death Rates
Other* Nephropathy
%/year
60
50
40
30
20
10
0
0-19
20-29
30-39
40-49
50-59
60-64
65-69
70-79
>80
Age
USRDS
DNSL
* Not diabetes, hypertension
or glomerulonephritis


Dialysis Patient Survival 1990-2002
Primary Renal Disease, Age 20-65 only
Cumulative
Proportion
Surviving
1,00
0,95
0,90
0,85
0,80
0,75
0,70
0,65
0,60
0,55
0,5
p<0.02
p<0.01
90-day mortality excluded
0
3
6
9
12
Time (years)
90-93
94-97
>97

Analysis of patient and graft survival

Melvin Madsen, Tine Høtbjerg Henriksen and Hans Løkkegaard

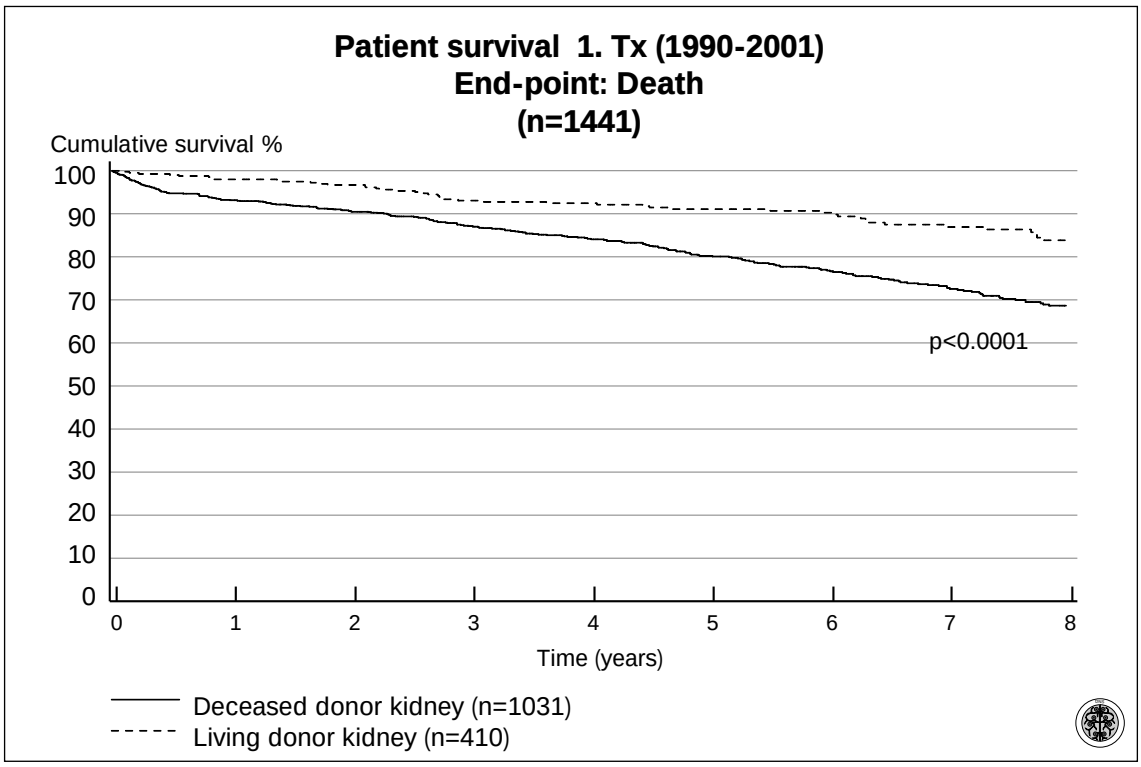


Fig. 1. Patient survival. First transplant 1990 - 2001. Living donor kidney versus deceased donor kidneys.

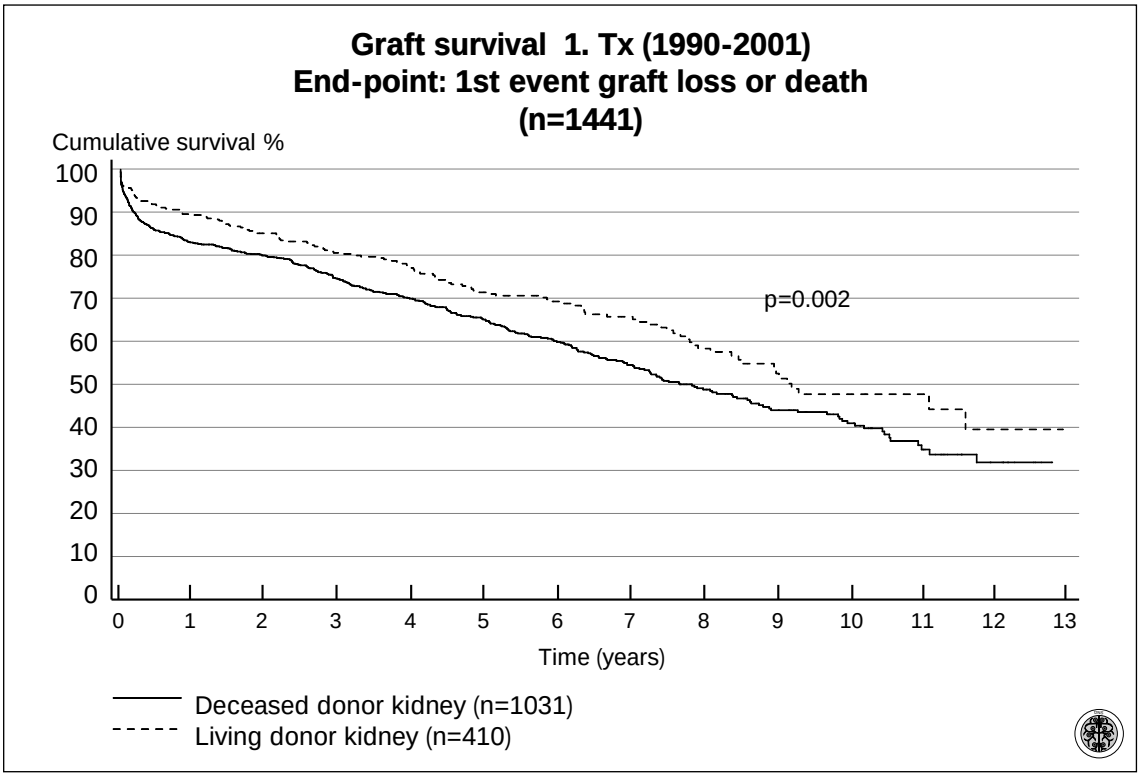


Fig. 2. Graft survival. First transplant 1990 - 2001. Living donor kidney versus deceased donor kidneys.

Influence of tissue typing

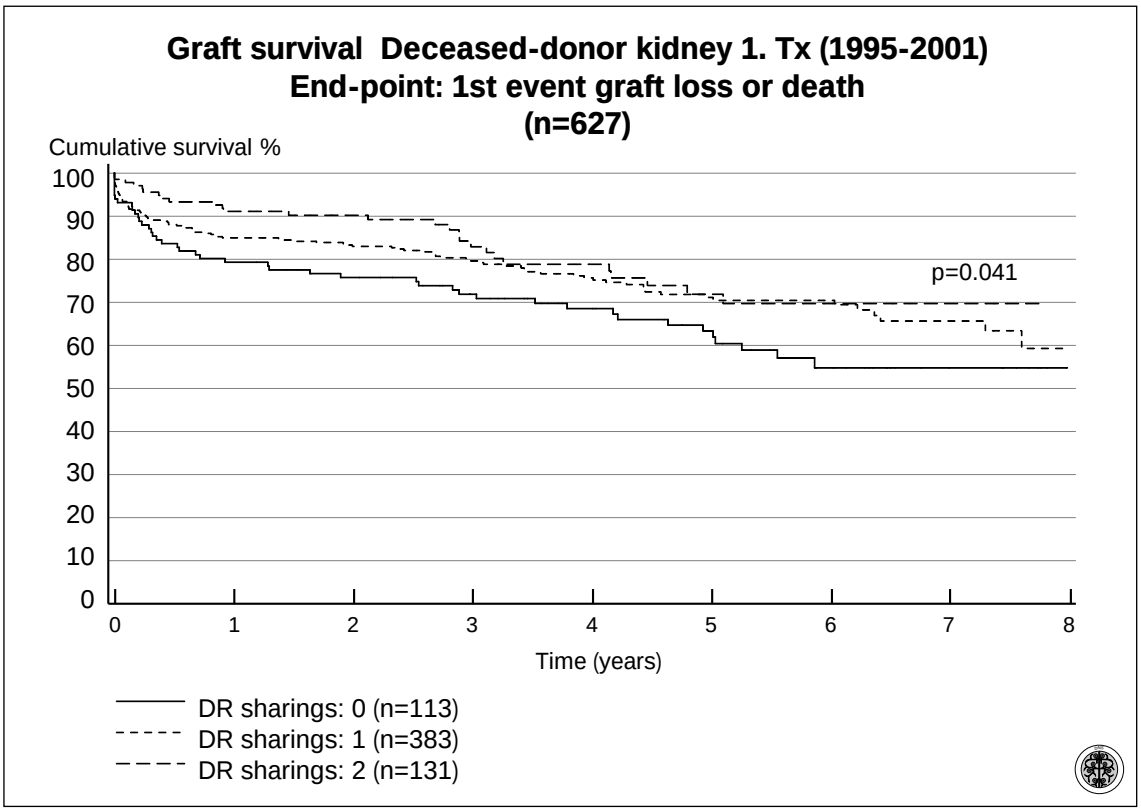


Fig. 3. Graft survival. First kidney transplant 1990 - 2001. Deceased donor kidney. Graft survival and HLA DR sharing between donor an recipient.

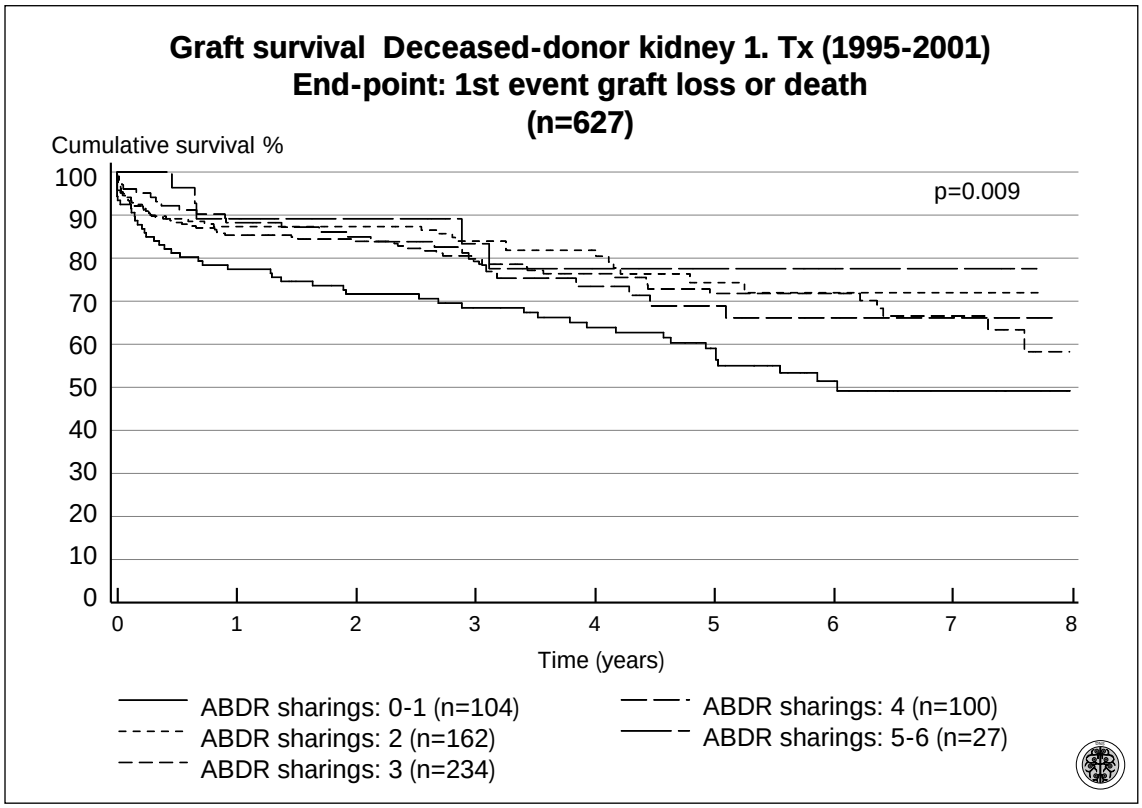


Fig. 4. Graft survival. First kidney transplant 1990 - 2001. Deceased donor kidney. Graft survival and HLA A,B,DR sharing between donor an recipient.

Influence of donor and recipient age

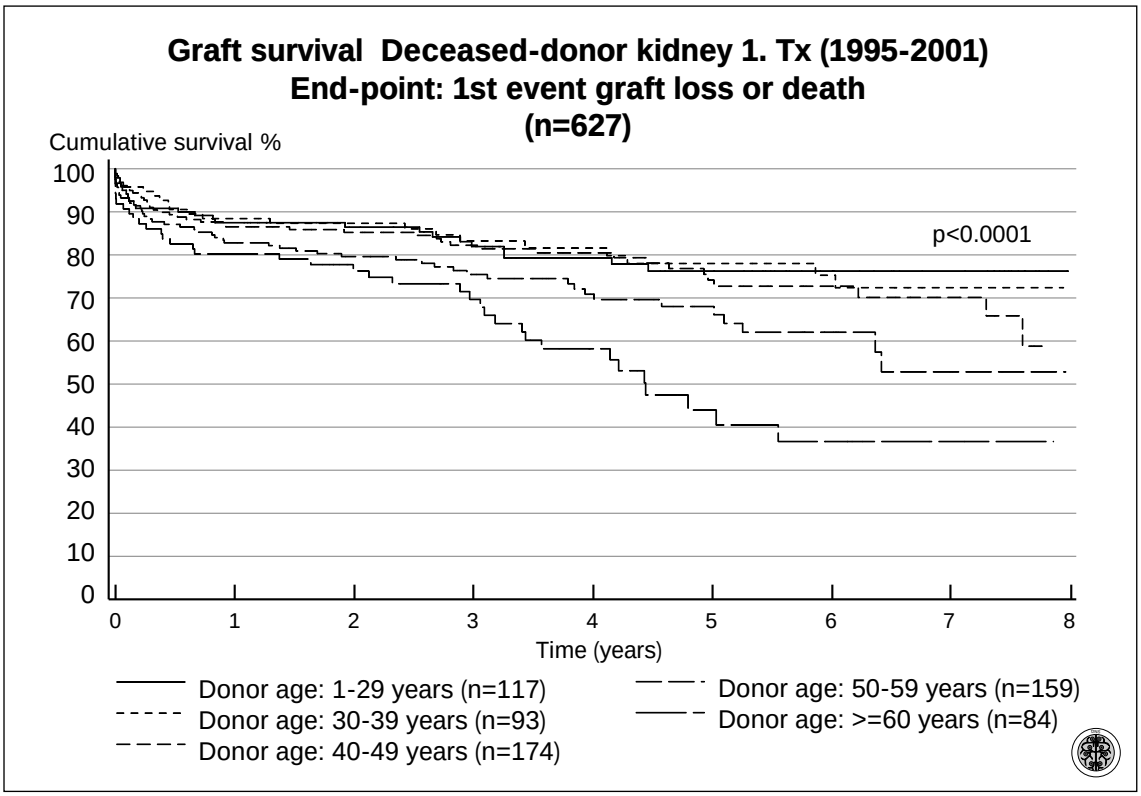


Fig. 5. Graft survival. First transplant 1995-2001. Deceased donor kidnys. Graft survival and donor age.

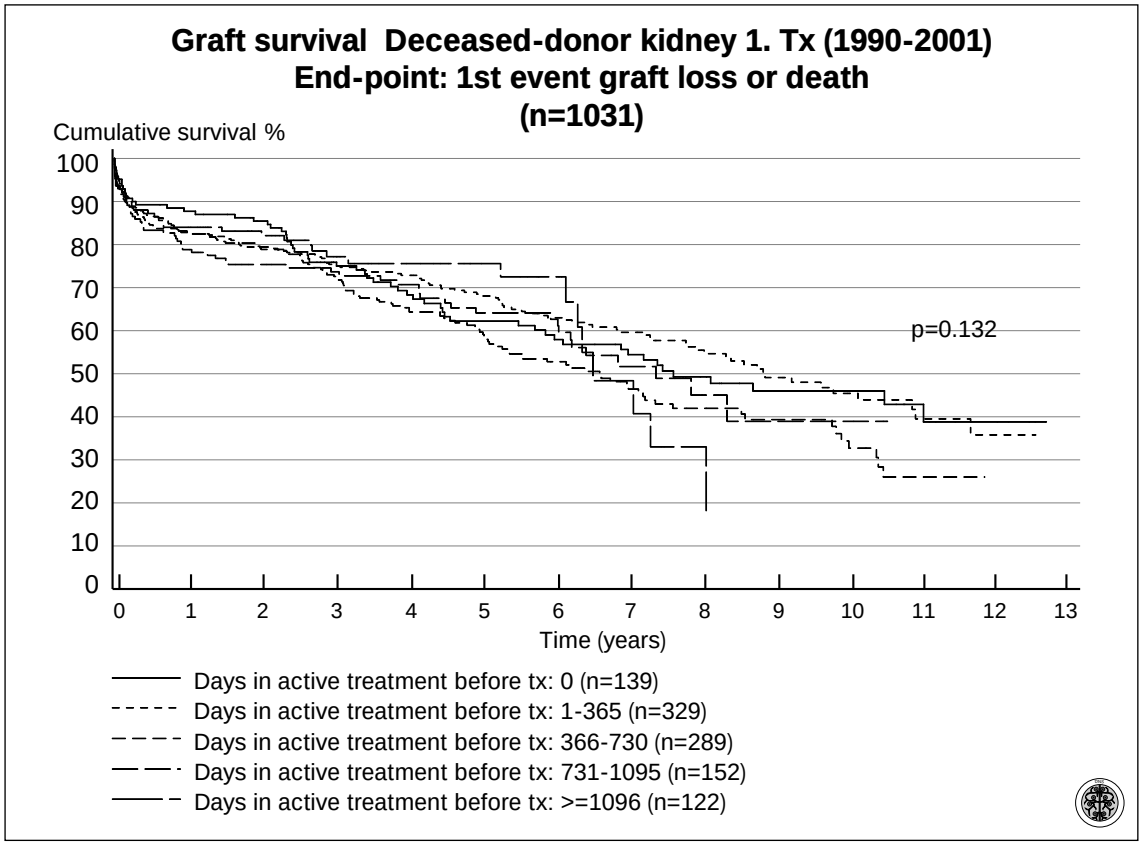


Fig. 6. Graft survival. First transplant 1990-2001. Deceased donor kidneys. Graft survival and time period between start on dialysis and transplantation.

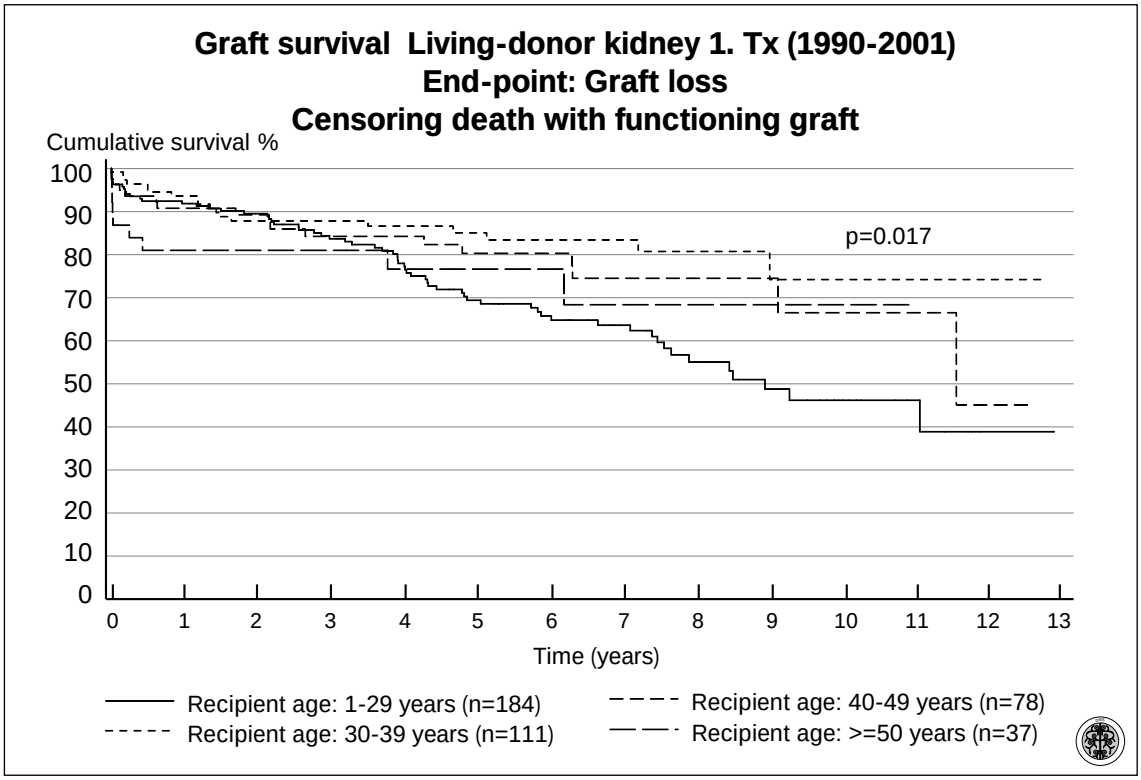


Fig. 7. Graft survival. First transplant 1990-2001. Living donor kidney. Graft survival and recipient age censoring death with functioning graft.

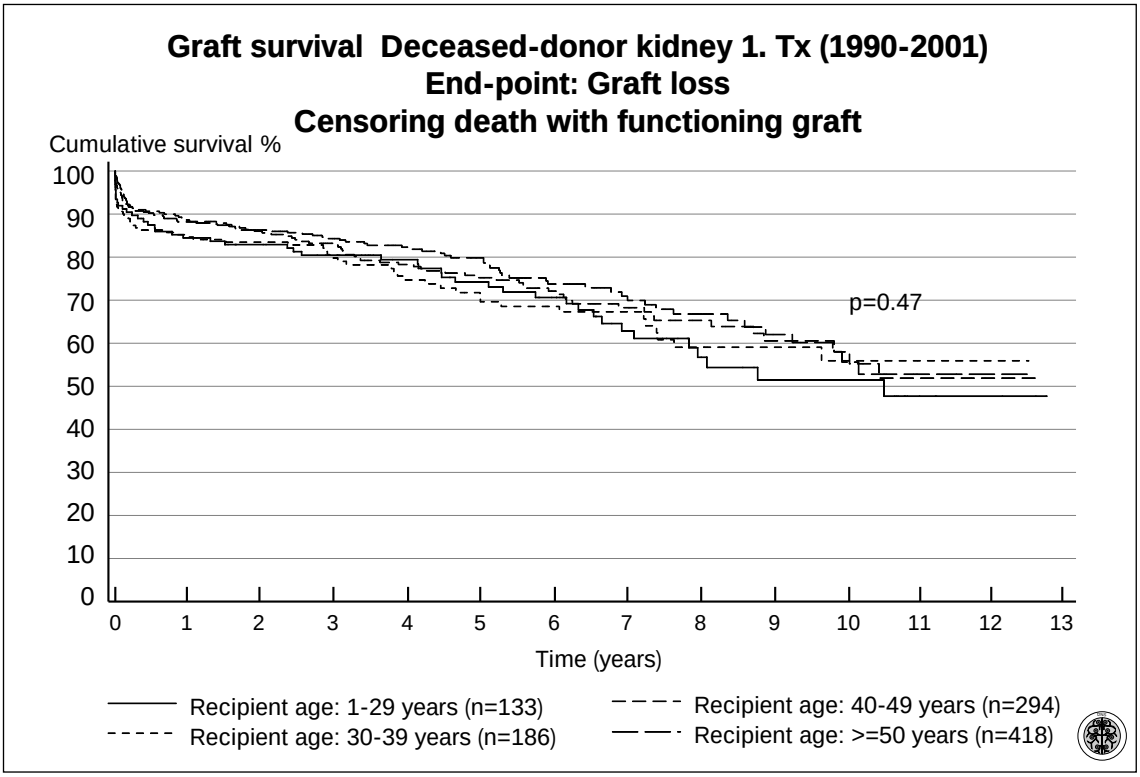


Fig. 8. Graft survival. First transplant1990-2001. Deceased donor kidney. Graft survival and recipient age censoring death with functioning graft.

Influence of gender

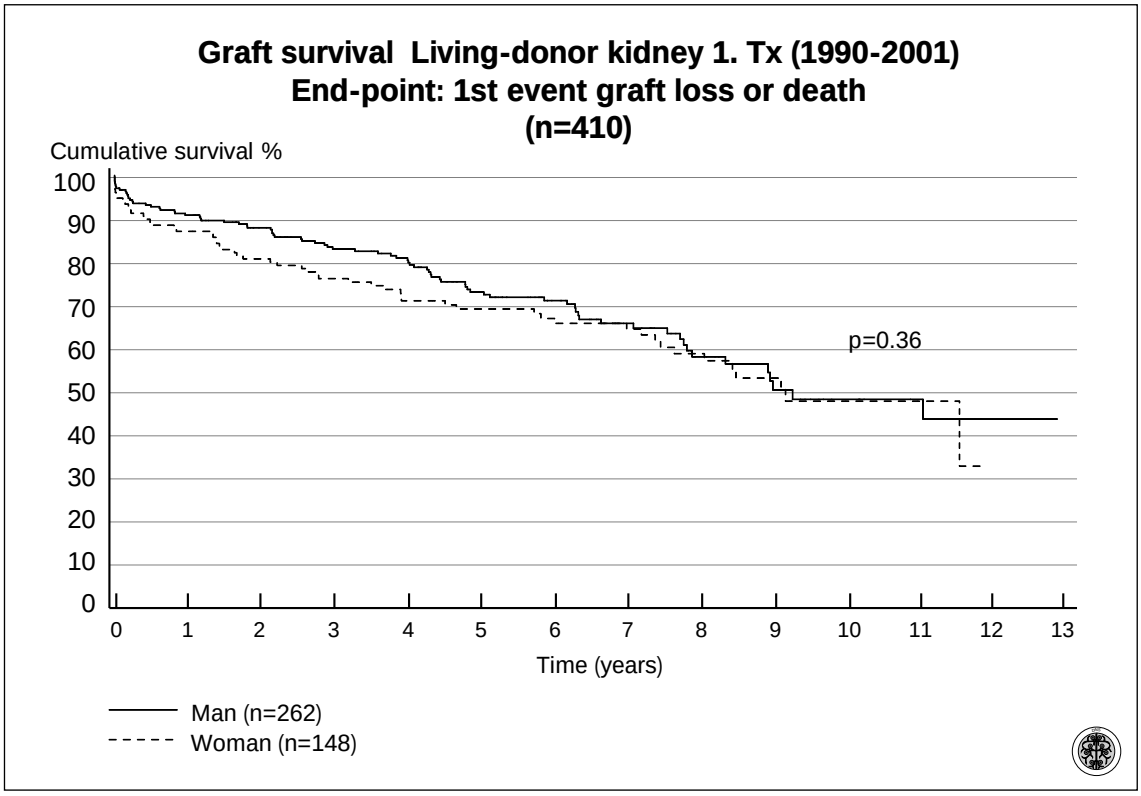


Fig. 9. Graft survival. First transplant 1990-2001. Living donor. Graft survival and recipient gender.

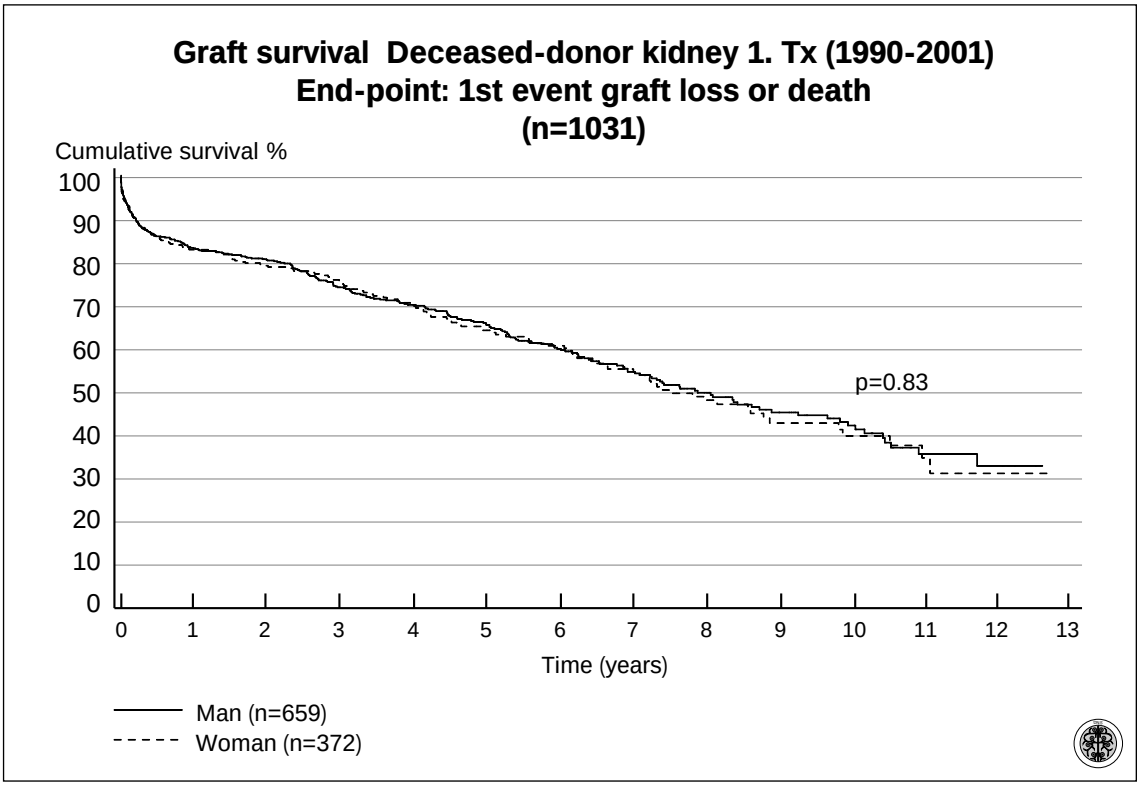


Fig. 10. Graft survival. First transplant 1990-2001. Deceased donor. Graft survival and recipient gender.

Influence of renal diagnosis

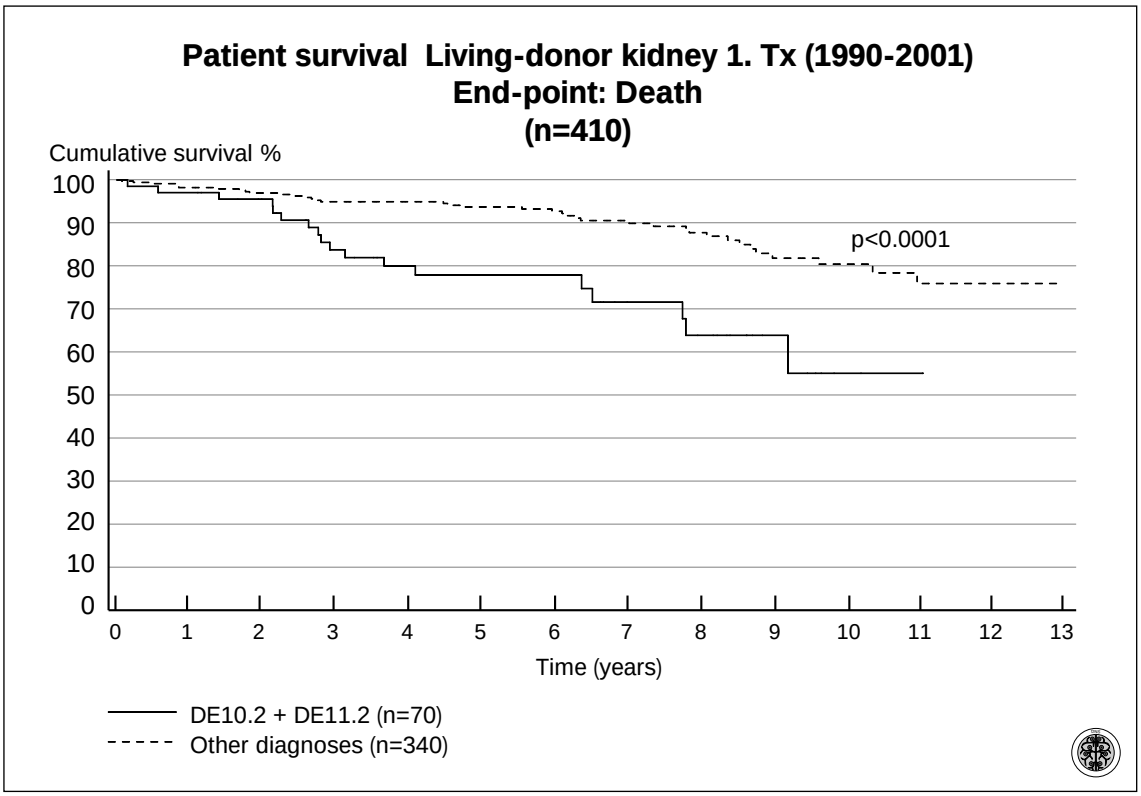


Fig. 11. Patient survival. First transplant 1990 - 2001. Living donor kidney. Diabetes (DE10.2 = type 1 and DE11.2 = type 2).

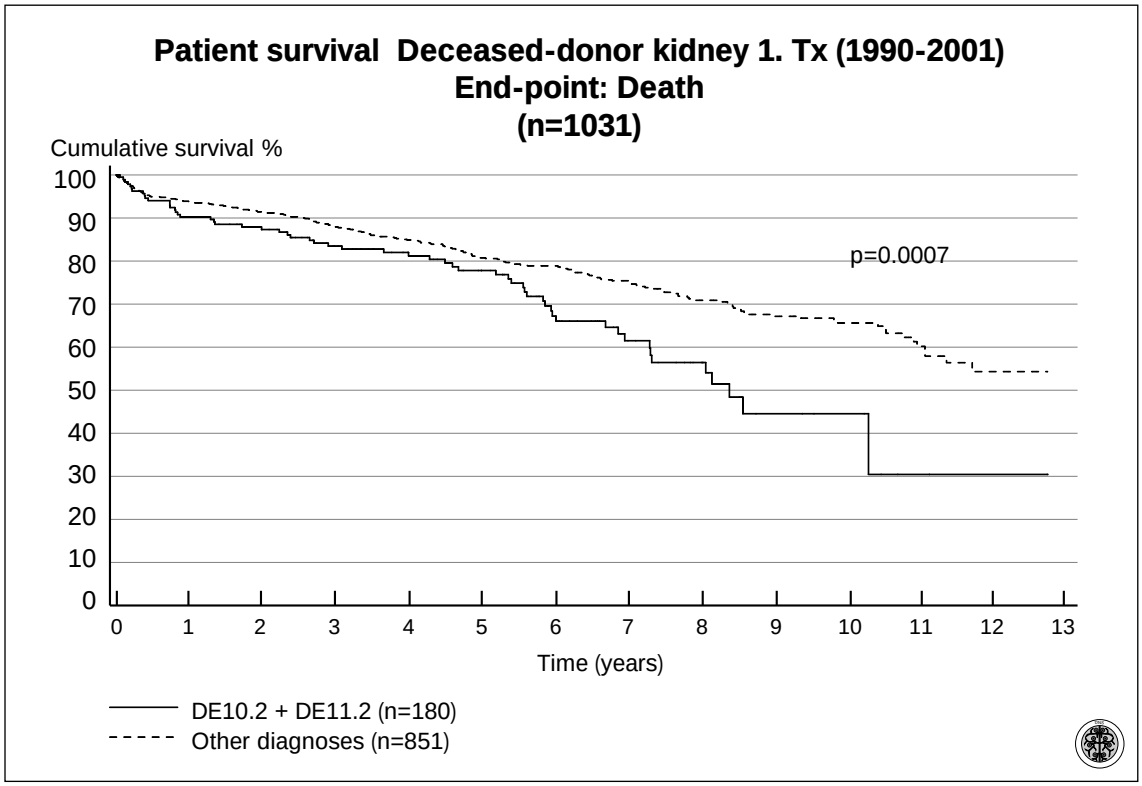


Fig. 12. Patient survival. First transplant 1990-2001. Deceased donor kidney. Diabetes (DE10.2 = type 1 and DE11.2 = type 2.

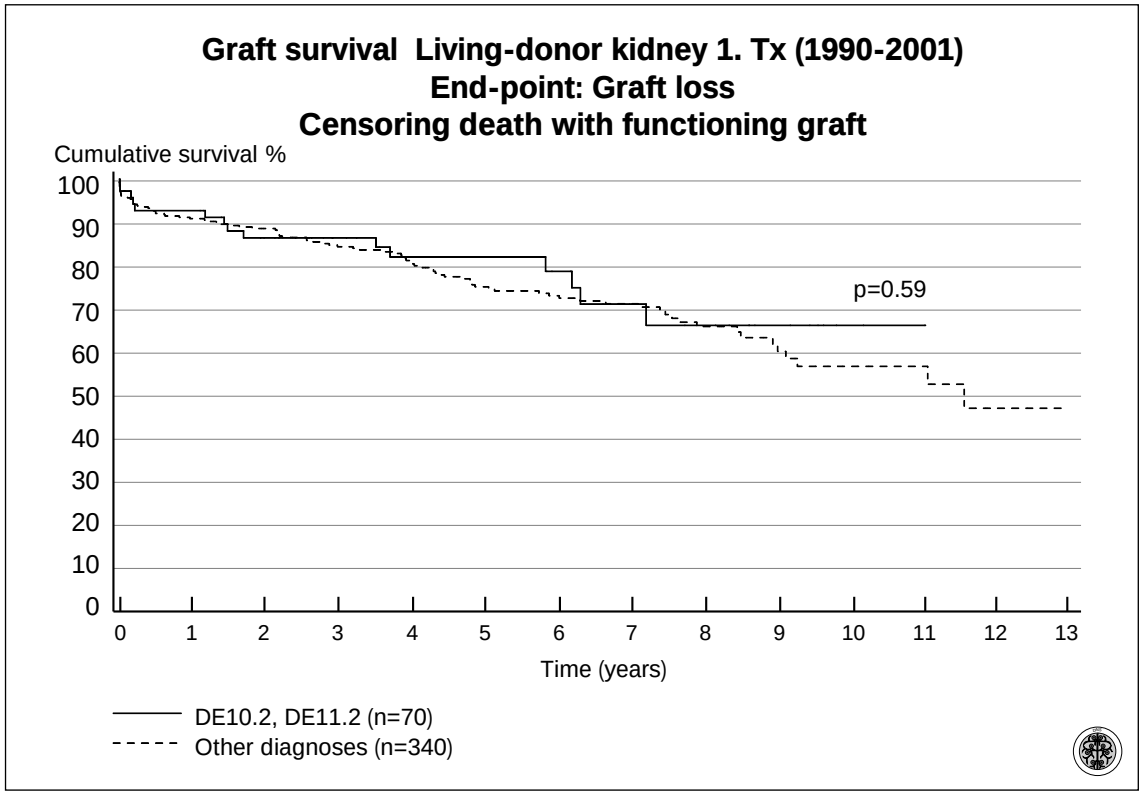


Fig. 13. Graft survival. First transplant 1990-2001. Living donor kidney. Diabetes (DE10.2 = type 1, DE11.2 = type 2). Censoring death with functioning graft.

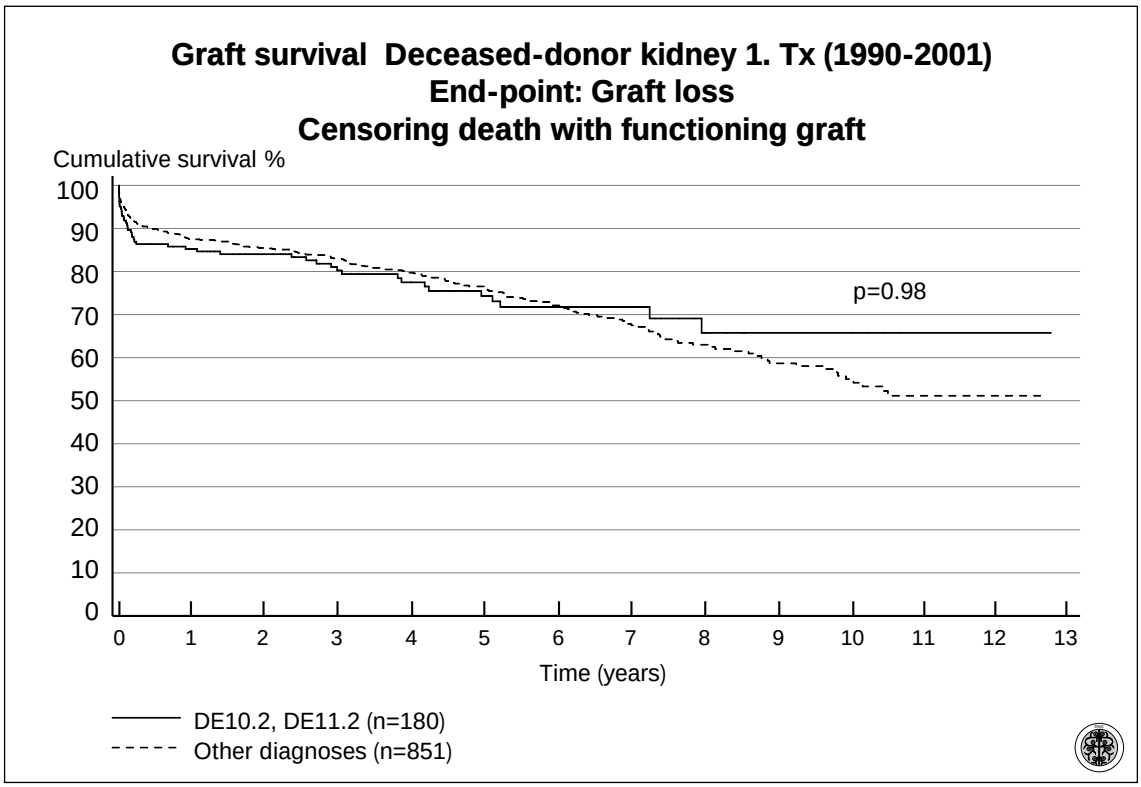


Fig. 14. Graft survival. First transplant 1990-2001. Deceased donor kidney. Diabetes (DE10.2 = type 1, DE11.2 = type 2). Censoring death with functioning graft.

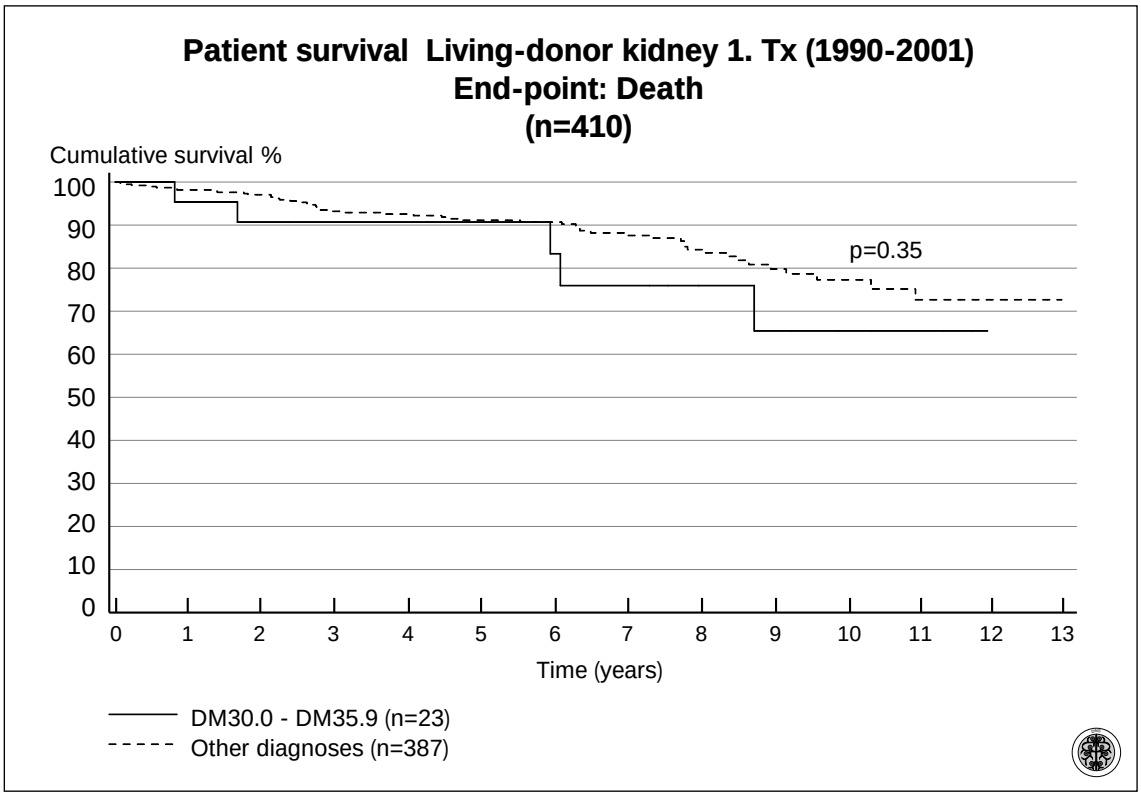


Fig. 15. Patient survival. Living donor kidney. First transplant 1990 - 2001. DM30.0 – DM35.9 = Systemic diseases including SLE, Wegener, Goodpasture, renal vasculitis, periarteritis nodosa.

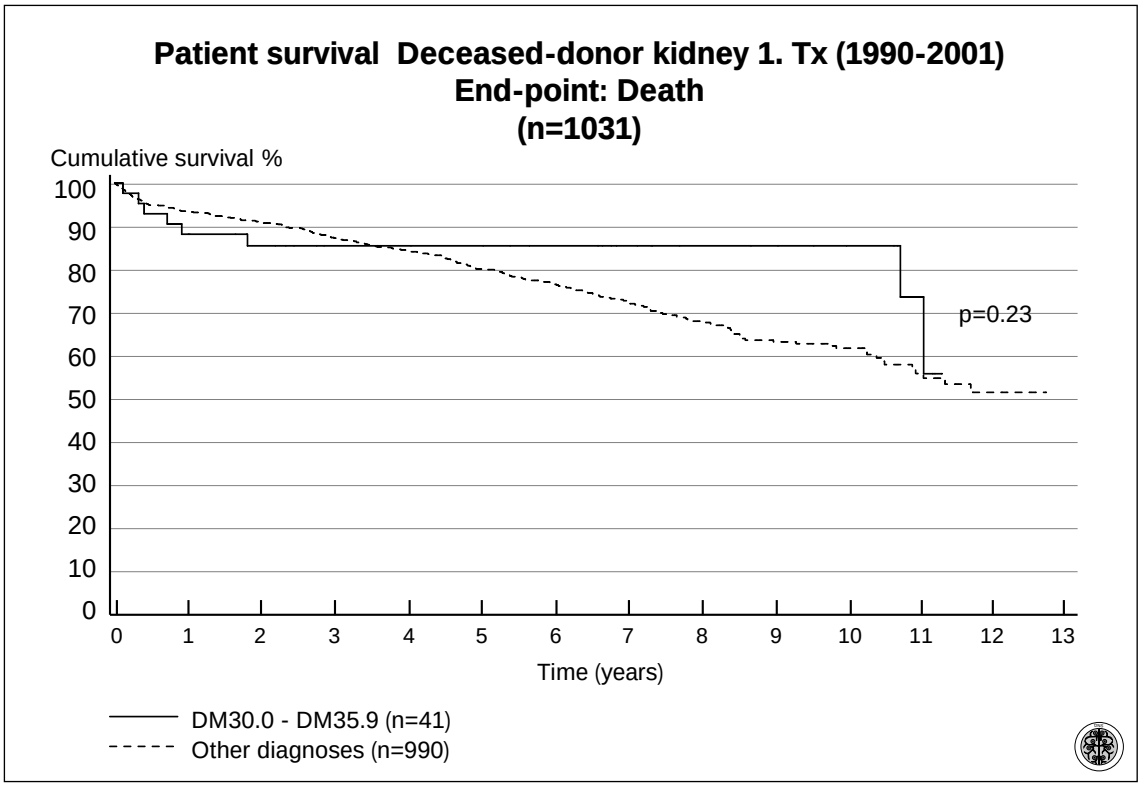


Fig. 16. Patient survival. Deceased donor kidney. First transplant 1990 - 2001. DM30.0 – DM35.9 = Systemic diseases including SLE, Wegener, Goodpasture, renal vasculitis, periarteritis nodosa.

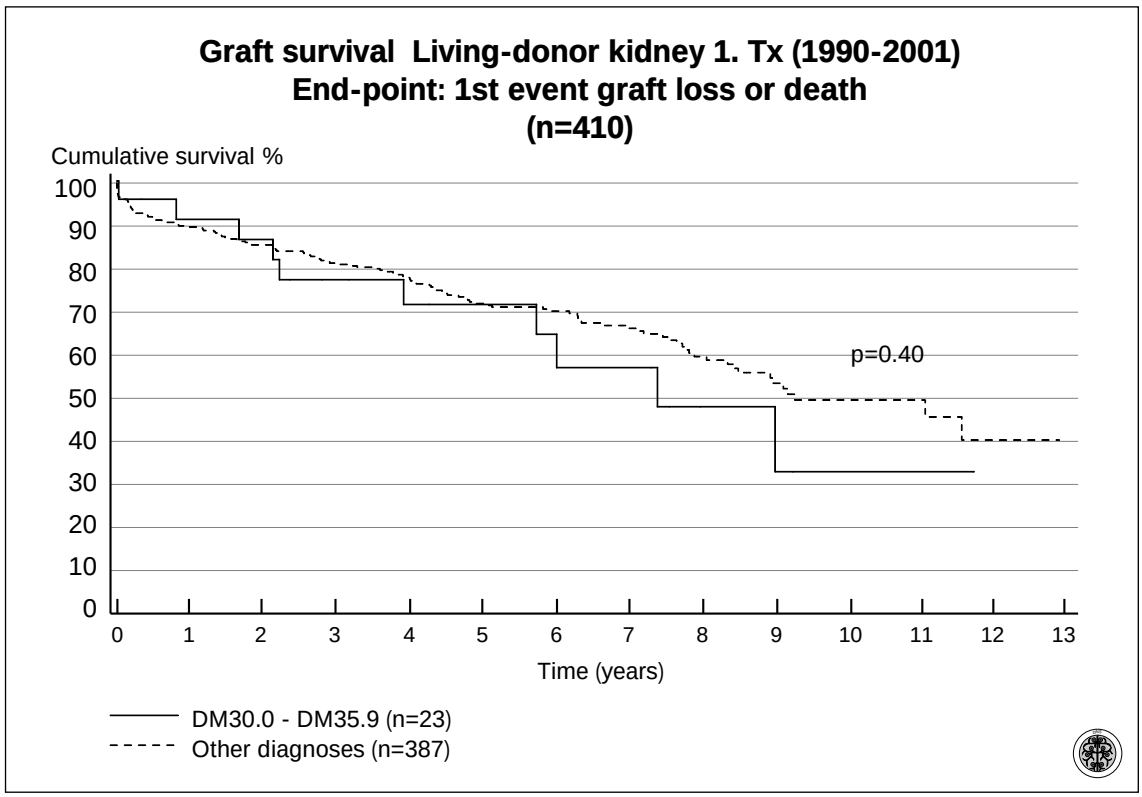


Fig 17. Graft survival. Living donor kidney. First transplant 1990 - 2001. DM30.0 – DM35.9 = Systemic diseases including SLE, Wegener, Goodpasture, renal vasculitis, periarteritis nodosa.

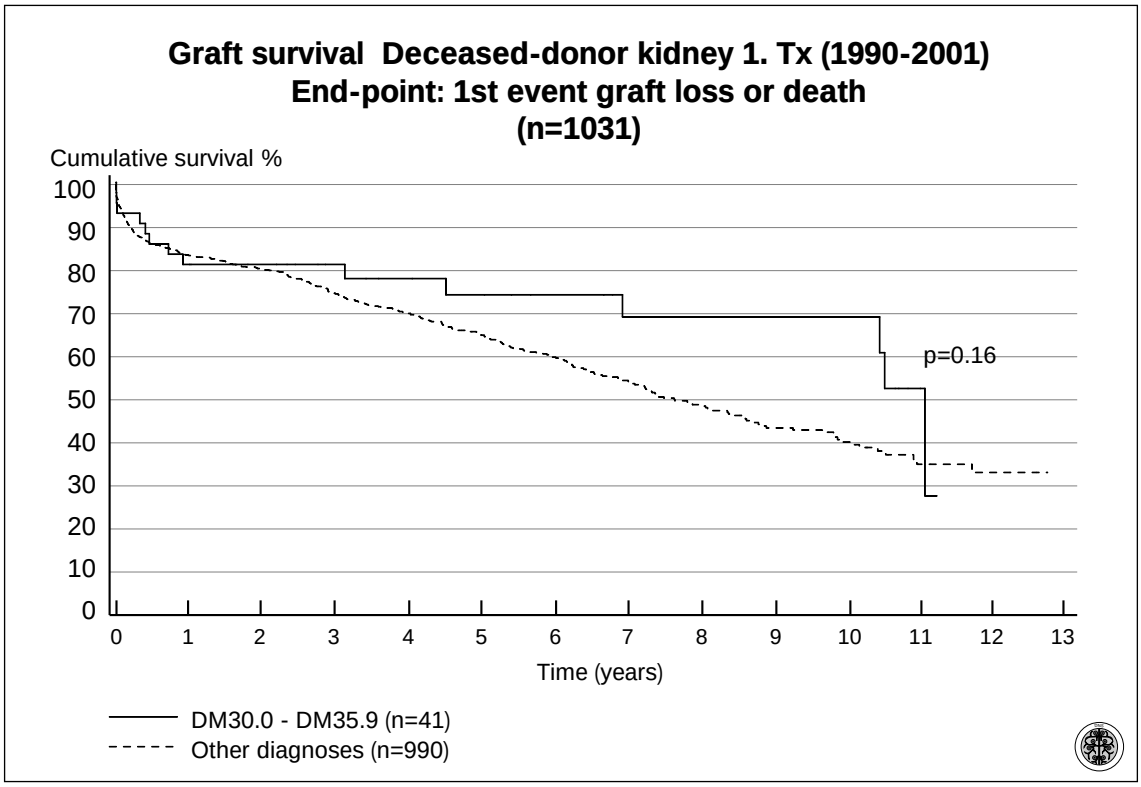


Fig. 18. Graft survival. Deceased donor kidney. First transplant 1990 - 2001. DM30.0 – DM35.9 = Systemic diseases including SLE, Wegener, Goodpasture, renal vasculitis, periarteritis nodosa.

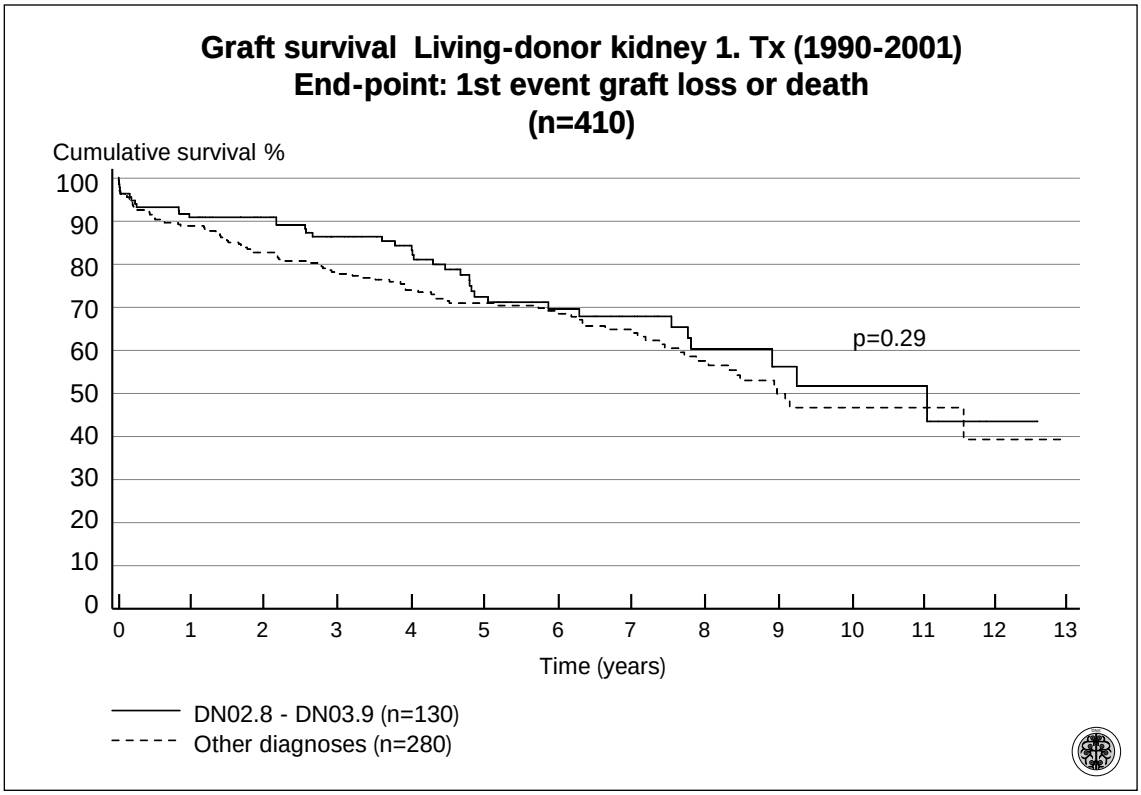


Fig. 19. Graft survival. Living donor kidney. First kidney transplant 1990 - 2001. DN02.8 – N03.9 = glomerulonephritis.

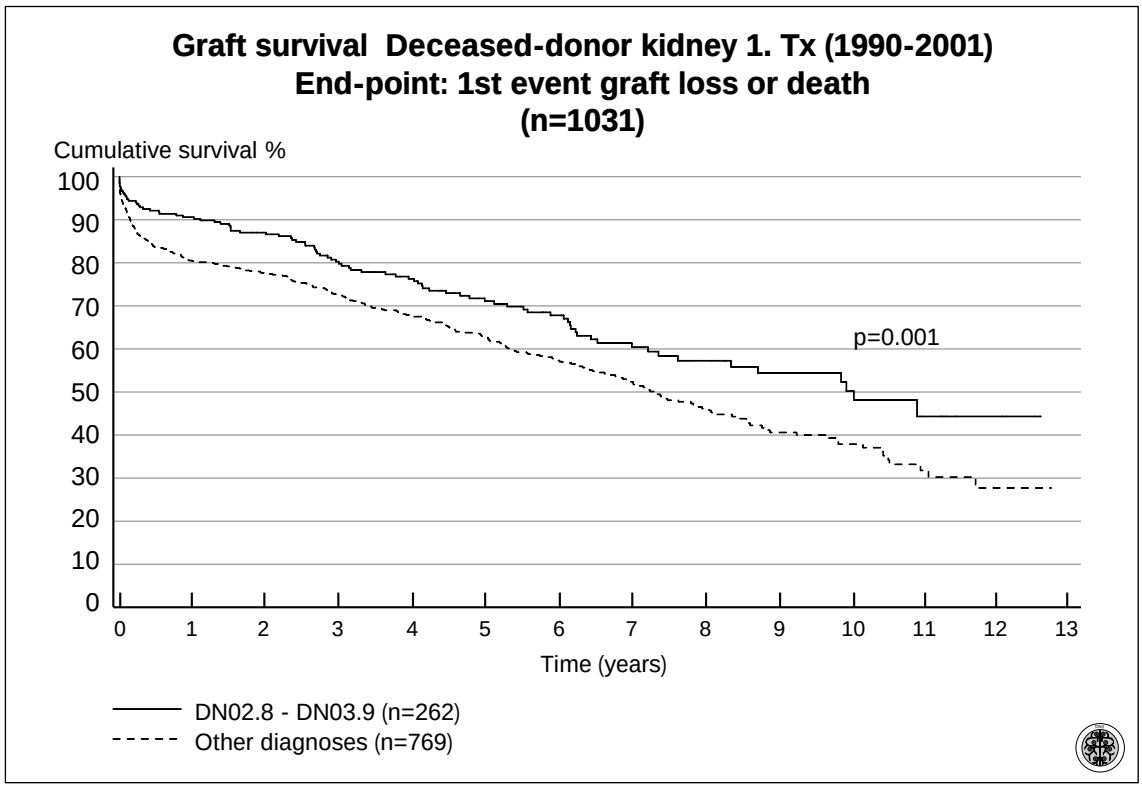


Fig. 20. Graft survival. Deceased donor kidny. First kidney transplant 1990 - 2001. DN02.8 – N03.9 = glomerulonephritis

Prognosis for dialysis and kidney transplant activity in Denmark

Peter Vestergaard

Background:

The present work is based on three previous prognoses. The first prognosis used the figures for incidence and migrations between treatment modalities for the period 1990 to 1995 (Danish Society for Nephrology, Report for 1995). It used assumptions concerning the number of patients entering and leaving hemodialysis (HD) and peritoneal dialysis (PD). The calculations were made separately for HD and PD. This prognosis predicted an increase in the number of patients in active treatment with renal replacement therapy (RRT) even with an unchanged incidence of new patients.

The second prognosis was based on the period 1990 to 1997 (Danish Society for Nephrology, Report for 1997) and did – in contrast to the first prognosis – consider the migrations between the different treatment modalities (HD, PD and patients with renal grafts).

The third prognosis (Danish Society for Nephrology, Report for 1999) extended the second prognosis by modelling different scenarios for the future changes in incidence rates.

The fourth prognosis (Danish Society for Nephrology, Report for 2002) was an update using two scenarios: 1) A linear increase in incidence in subjects aged 60 years and more and an unchanged incidence in all other groups, and 2) unchanged incidence rates (the average of the last three years).

The methods used have been presented previously (Nephrol Dial Transplant 1997: 12: 2117-2123).

However, since then a shift in incidence in subjects aged 60 years or more has occurred as the incidence is no longer increasing but rather being stable.

Prognoses:

The prognostic model uses the assumption that the number of patients in treatment in a given year is the sum of new patients minus the number of patients leaving therapy plus the number in therapy in the previous year. Assuming that 100 patients were on RRT in a given year and that 10 new patients entered therapy during the following year while 5 patients left therapy, the number of patients in therapy the following year must be: 100 + 10 - 5 = 105. It is assumed that the number leaving therapy can be described as a constant fraction of those in therapy. E.g. assuming that 5% of patients die each year, 0.05 * 100 = 5 will die out of the 100 in treatment.

Prognoses:
One prognostic model was used based on the observed incidence rates in fig. 1. The incidence and mortality rates were considered to be stable and the average of the last six years, except for the incidence for patients aged 60 years or more, where the last three years were used.

Discussion:
In the new scenario, the increase is rather close to the “stable incidence” scenario from 2002, as the change in incidence rates is limited within the last years. The increase is significantly smaller than in the "linear increasing" scenario due to the decline in incidence rates in subjects aged ≥60 years.

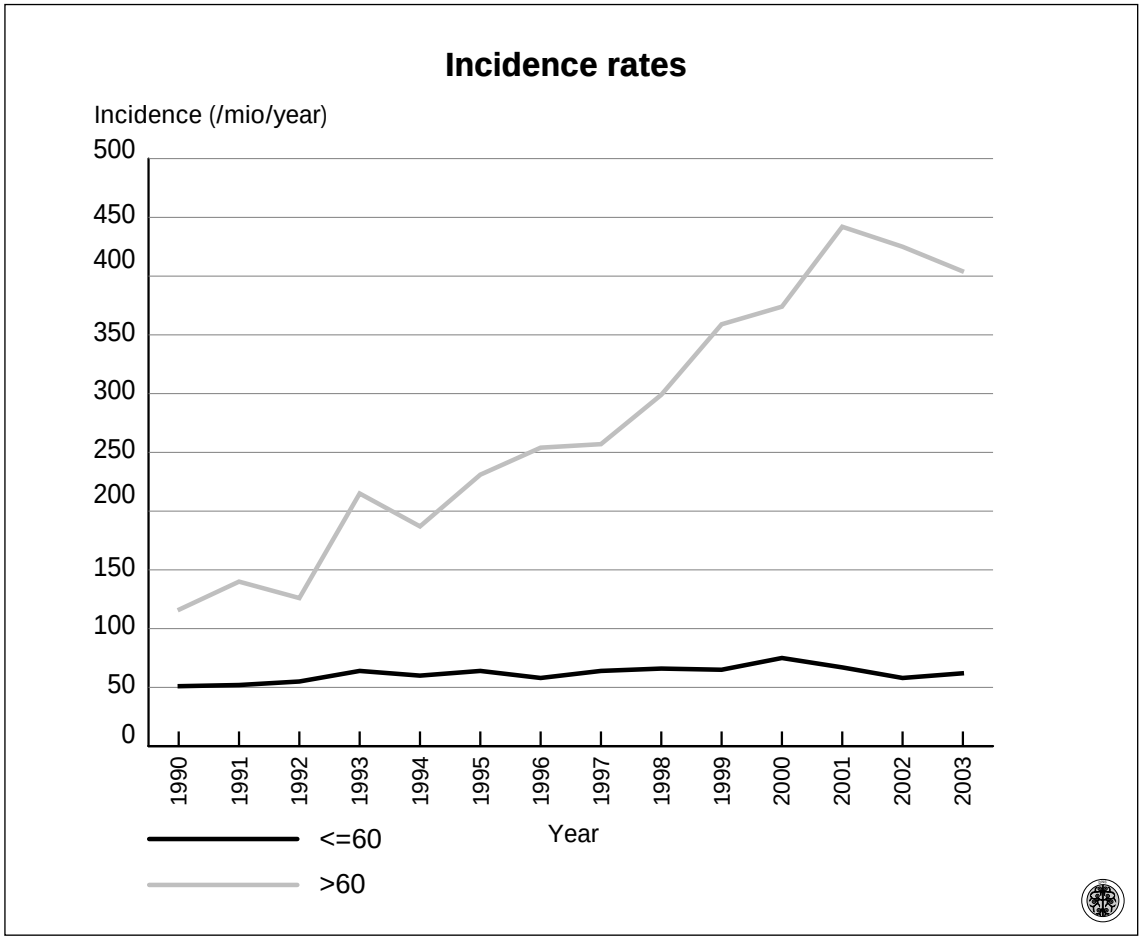


Fig. 1. Incidence rate of new patients expressed as number of patients per million inhabitants in actual age group in each year. An example of a linear trend curve has been inserted for subjects older than 60 years at treatment start.

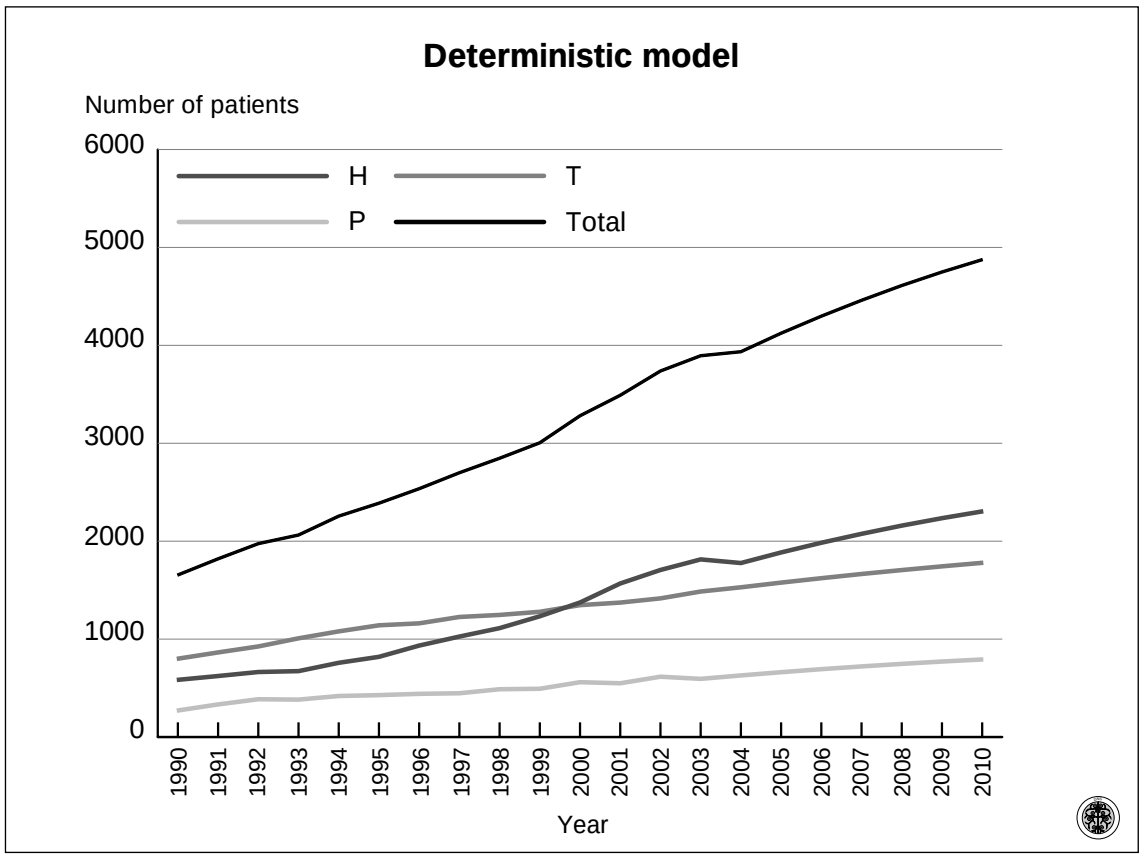


Fig. 2. Prevalence of patients and prognosis stratified by treatment modality.

Year	H	P	T	Total
2005	1885	662	1577	4124
2006	1984	693	1622	4298
2007	2075	721	1665	4460
2008	2159	747	1705	4611
2009	2235	771	1743	4749
2010	2304	792	1779	4875

Table 1

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