DANSK NEFROLOGISK SELSKAB

Landsregister

Årsrapport 2008

Danish Nephrology Registry

Annual Report 2008

The Danish Society of Nephrology

.

Forord

Om DNSL

DNSL har eksisteret siden 1.1.1990 som landsdækkende database for registrering af behandling af patienter med terminal nyresvigt (ESRD), men indeholder data tilbage til 1964. Databasen blev oprettet af Dansk Nefrologisk Selskab (DNS), men har siden 2000 modtaget støtte fra Sundhedsstyrelsen, senere Danske Regioner.

DNSLs formål er:

1) At opfylde Danske Regioners krav om klinisk kvalitetssikring og herunder monitorere behandlingskvaliteten inden for sygdomsområdet.
2) At sørge for overholdelse af ERA-EDTAs (den europæiske renale samarbejdsorganistation) formelle krav til datarapportering på national plan
3) At fungere som databank til fremtidige epidemiologisk forskning
4) At producere årsrapporter om den kliniske behandlingskvalitet og epidemiologiske analyser af interesse for DNSs medlemmer.

DNSL registrerer følgende:

1) Indgangs og udgangsoplysninger på alle patienter med terminal nyresvigt (ESRD)
2) Forløbsdata på samme patientgruppe, f.eks dialyseform, overflytninger, transplantationsdetaljer, rejektioner og peritonitter.
3) ERA-EDTA biokemisk kvalitetsindikatorer, som downloades direkte fra de involverede biokemiske afdelinger.

Målgruppen for rapporten er Danske Regioner, medlemmer af DNS, Kompetencecenter Syd og ERA-EDTA Registry (den europaiske dialyse og transplantations samarbejdsorganisation). Databasen er finansieret af Danske Regioner, og administreres som et samarbejde imellem DNS, Kompetencecenter Syd, CSC og de 15 nefrologiske sygehusafdelinger i Danmark. Der er ingen private ESRD behandling i Danmark.

2008

Det har atter været et begivenrigt år for DNSL. Det nye on-line system, Topica, som administreres af CSC, blev taget i brug i september 2008, efter at alle data fra den gamle database var blevet valideret og importeret. Opstarten var forsinket, men data fra januar til august 2008 blev indtastet med tilbagevirkende kraft, takket være en stor indsats fra de medvirkende sekretærer og læger.

Fremover skal registrering foregå løbende. Driften af Topica har generelt været tilfredstillende, men enkelte fejl vil blive rettet i løbet af 2009.
Det er også det første år hvor Kompetencecenter Syd (KS) bidrager til årsrapporten med deres statistiske ekspertise. Efter aftale, er mange tabellers struktur uændret i forhold til tidligere år, men indholdet kan være blevet ændret lidt, også med tilbagevirkende kraft, p.g.a. ændringer i opgørelsesmetoder. Som noget nyt, præsenterer KS resultatet af DNSLs fem kvalitetsindikatorer. Nogle af disse vil være kendt fra tidligere, f. eks. graftoverlevelse hos de nyretransplanterde, mens to er helt nye: andelen af patienter med tidlig henvisning til nefrologisk afdeling, og andelen af patienter med rutine (planlagt) start af dialyse.
Efter diskussion har registret besluttet at registret fremover skal hedde: Danish Nephrology Registry.

2009

Der er ikke i 2009 planlagt nye initiativer, men blot en optimering af de netop foretagede ændringer. Blandt planlagte tiltag kan nævnes:

1) Nuuk oprettes som et selvstændigt dialysecenter.
2) Udvalget arbejder på implemetering af en forkortet udgave af ERA-EDTAs moderniserede kodesystem for renale diagnoser. Arbejdet kan tidligst implementeres i 2011.
3) Årsrapporten skal nu godkendes af registerudvalget og KS før publikation, hvilket ikke kan nås inden årsmødet. Den mundtlige præsentation til årsmødet må nødvendigvis være præliminær, og enkelte ændringer i forhold til det trykte eksemplar vil forekomme. For at undgå konfusion, har udvalget besluttet fremover (med virkning allerede fra 2009) at vente med ofentliggørelse af både den skriftlige og mundtlige udgave til efteråret.
4) Den hidtige definition af elektiv vs. akut PD opstart, som ambulant vs. indlagt opstart har vist sig at være utilfredsstillende. Der arbejdes på en ny definition.
5) Rapportfunktionen i Topica forventes færdig i 2009. Centrene vil herefter være i stand til selv at generere både incidens- og prævalensdata for deres egen center.
6) De biokemiske data vil blive indbygget i Topica, men foreløbig uden rapportfunktion.

DNS Registerudvalg

Udvalget består af følgende medlemmer:
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Professor *Anders Green*

Årsrapport 2008

Årsrapporten bevarer sin sædvanlige struktur. Regionale incidensrater har hidtil været baseret på centerstatistik. Dette er unøjagtigt idet patienter tit henvises på tværs af både center- og regionsgrænser. På denne baggrund udelades disse data indtil videre. En retrospektiv opgørelse planlægges når mulighed for automatisk import af patientadresser er til stede. Årsrapportens indhold har været til høring blandt medlemmer af registerudvalget og Kompetencecenter Syd.
Data for årsrapporten 2008 leveres af Kompetencecenter Syd for første gang. Følgende ændringer i forhold til den tidligere dataanalyse er foretaget.

1) Dataopgørelsen vedrører behandling af danske patienter (dvs med dansk cpr-nr.) i Danmark.
2) Patienter med et ulogisk behandlingsforløb er ekskluderet fra analysen. Disse patienters forløb vil blive rettet i løbet af 2009, og inkluderet i årsrapporten for 2009 med tilbagevirkende kraft. Der er først og fremmest tale om ældre forløb.

Som særlig rapporter præsenteres:

1) En prognose for ESRD.
2) Parathyreoidektomi i Danmark
3) Rejektionsstatistik 1990-2007, og korrelationer hertil.

August 2009 James Heaf
Registeransvarlig
National Coordinator

Påtegning fra Kompetencecenter Syd

I henhold til basiskravene for de nationale kliniske kvalitetsdatabaser skal Kompetencecenter Syd fremlægge følgende bemærkninger.

Årsrapporten for 2008 fra Dansk Nefrologisk Selskabs Landsregister (DNSL) bringer for første gang analyser og resultater, der er baseret på den nye forløbsbaserede IT-platform (TOPICA), som blev taget i brug i 2008.

I rapporten omtales registrerings- og datakomplethed samt de nye og gamle indikatorer (herunder hvad angår overlap mellem de to indikatorsæt). Registreringskompletheden kan ikke kvantificeres objektivt, da det ud fra landspatientregisterets data endnu ikke har været muligt automatisk at definere det endelige patientunivers p.g.a. af manglende valid sondring mellem akut – og potentielt reversibel – nyresvigt over for kronisk nyresvigt. En nylig ad hoc-opgørelse af registerets data har imidlertid sandsynliggjort en meget høj grad af registreringskomplethed (>96%). For flere indikatorer, herunder mortalitetsraten for patienter i dialyse, gælder, at datakompletheden ikke kan opgøres i relation til det enkelte behandlingscenter, da patienterne kan skifte behandlingssted. Ud fra det antal behandlingsforløb, der har måttet udelukkes fra indikatorberegninger som følge af manglende eller inkonsistente data, er datakompletheden meget høj (>97%).

Rapporten indeholder et selvstændigt kapitel, hvori indikatorerne præsenteres. I det omfang, det hidtidige datasæt har muliggjort det, er de nye indikatorer værdisat. I kapitlets afsluttende del kommenteres kvalitetsrelaterede aspekter for hver indikators resultater.

Kompetencecenter Syd har i samarbejde med DNSL forestået klargøringen af den foreliggende rapports datasæt og valideret data inden for de enkelte uræmi- og behandlingsforløb. Kompetencecenteret har endvidere forestået analysen af indikatorerne og visse af de indledende oversigtsanalyser. Det kan herved bekræftes, at der i disse forhold er statistisk-epidemiologisk belæg for de anførte kommentarer og konklusioner.

Kompetencecenter Syd indgår i det fremadrettede arbejde med databasens fortsatte udvikling, herunder hvad angår udnyttelse af data fra de centrale sundhedsregistre til supplering og validering.

Odense 8. september 2009

Anders Green

Professor, overlæge, dr.med.

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Prævalens og Incidens / Prevalence and Incidence

Tabel 1: Centeroversigt / Centre overview

List of dialysis centres	Code	Region (where centre is placed)
Rigshospitalet (RH)*	1301	Hovedstaden
Hvidovre	1330	Hovedstaden
Herlev*	1516	Hovedstaden
Hillerød	2000	Hovedstaden
Roskilde	2501	Sjælland
Holbæk	3000	Sjælland
Nykøbing F	3500	Sjælland
Rønne	4001	Hovedstaden
Odense*	4202	Syddanmark
Sønderborg	5001	Syddanmark
Esbjerg	5501	Syddanmark
Fredericia	6007	Syddanmark
Holstebro	6501	Midtjylland
Skejby*	7026	Midtjylland
Viborg	7601	Midtjylland
Aalborg	8001	Nordjylland

* Centres are current transplantation centres as well

Tabel 2. Forkortelser / Abbreviations

DNSL	Dansk nefrologisk selskabs Landregister
ESRD	End stage renal disease
PD	Peritoneal dialysis
HD	Hemodialysis
CAPD	Continuous ambulatory peritoneal dialysis (day)
APD	Automatic peritoneal dialysis (night)
IPD	Intermittent peritoneal dialysis
Lim. Care	Limited care dialysis
CCPD	Continuous cyclic peritoneal dialysis

Tabel 3: ESRD Prævalens / Prevalence of ESRD 1990-2008

Per 31.12.	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Total in treatment:	1748	1892	1956	2150	2268	2390	2545	2694	2843	3066	3278	3516	3688	3845	3992	4071	4154	4395	4448
Transplantation	819	867	942	1010	1076	1088	1156	1165	1186	1240	1279	1313	1375	1455	1536	1591	1642	1735	1831
In dialysis	929	1025	1014	1140	1192	1302	1389	1529	1657	1826	1999	2203	2313	2390	2456	2480	2512	2660	2617
Types of dialysis:																			
HD	606	647	657	744	791	886	969	1071	1198	1311	1477	1612	1732	1776	1843	1854	1897	1989	2001
PD	323	378	357	396	401	416	420	458	459	513	516	586	573	607	606	612	602	648	591
HD+PD	0	0	0	0	0	0	0	0	0	2	6	5	8	7	7	14	13	23	25
Specific types of dialysis:																			
HD-Centre	545	591	604	687	731	821	898	1007	1125	1242	1397	1531	1649	1662	1711	1704	1709	1774	1780
HD-Centre: Lim. care	39	36	37	42	43	50	58	55	66	62	71	69	61	79	78	76	88	105	102
HD-Home	22	20	16	15	17	15	13	9	7	7	9	12	22	35	54	74	100	110	119
PD-Centre: IPD	33	38	29	30	21	20	12	10	8	11	8	2	0	3	2	1	2	6	7
PD-Home: IPD	2	1	2	1	0	5	15	12	11	5	2	1	1	1	2	2	1	2	2
PD-Home: CAPD	284	329	316	349	353	359	350	370	368	391	352	340	293	284	261	228	205	199	185
PD-Home: APD	4	10	10	16	27	32	43	66	72	106	154	243	279	319	341	381	394	441	397
PD+HD-Home	0	0	0	0	0	0	0	0	0	2	6	5	8	7	7	14	13	23	25
Home vs. centre dialysis:																			
Total Home:	*312*	*360*	*344*	*381*	*397*	*411*	*421*	*457*	*458*	*511*	*523*	*601*	*603*	*646*	*665*	*699*	*713*	*775*	*728*
HD-Home	22	20	16	15	17	15	13	9	7	7	9	12	22	35	54	74	100	110	119
PD-Home (IPD, CAPD, APD)	290	340	328	366	380	396	408	448	451	502	508	584	573	604	604	611	600	642	584
HD+PD-Home	0	0	0	0	0	0	0	0	0	2	6	5	8	7	7	14	13	23	25
Total Center:	*617*	*665*	*670*	*759*	*795*	*891*	*968*	*1072*	*1199*	*1315*	*1476*	*1602*	*1710*	*1744*	*1791*	*1781*	*1799*	*1885*	*1889*
HD-Centre (incl. Lim. Care)	584	627	641	729	774	871	956	1062	1191	1304	1468	1600	1710	1741	1789	1780	1797	1879	1882
PD-Centre (IPD)	33	38	29	30	21	20	12	10	8	11	8	2	0	3	2	1	2	6	7

Notes to table: All patients under active treatment per December, 31 of a given year are included. Patients are registered as in active treatment as soon as a treatment intervention is noted (that is, introductory administrative events are ignored). One transplantation (during 2008) has been registered as performed abroad – this transplantation is included here, but excluded in Table 9 below.

Tabel 4: Bevægelser ind og ude af databasen / Movements in and out of the database 1990-2008

Per 31.12.	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
Total in treatment	1748	1892	1956	2150	2268	2390	2545	2694	2843	3066	3278	3516	3688	3845	3992	4071	4154	4395	4448
Transplantation	819	867	942	1010	1076	1088	1156	1165	1186	1240	1279	1313	1375	1455	1536	1591	1642	1735	1831
In dialysis	929	1025	1014	1140	1192	1302	1389	1529	1657	1826	1999	2203	2313	2390	2456	2480	2512	2660	2617
Passive status per 31.12. due to:																			
Recovery	6	2	12	8	6	11	13	11	11	13	18	17	17	18	21	21	26	26	33
Moved abroad	0	3	1	0	0	2	1	2	3	1	2	6	2	4	2	0	2	4	2
Graft loss	0	2	0	0	0	0	0	0	2	0	0	1	1	3	0	0	1	0	2
Lost-to-follow-up	2	0	0	1	0	1	2	1	3	1	2	3	2	5	4	2	0	2	1
Movements within year:																			
Died	167	212	267	296	310	357	336	378	401	412	472	481	517	531	547	558	552	540	570
New patients	318	358	343	491	430	489	501	536	566	643	697	740	699	709	711	654	653	797	650
Patients re-entering the database	.	5	1	8	4	4	6	5	3	7	9	6	12	9	10	6	11	16	11

* Patients re-entering the database were of passive status before.

Notes to table:

All patients under active treatment per December, 31 of a given year are included. Patients are registered as in active treatment as soon as a treatment intervention is noted (that is, introductory administrative events are ignored).

One transplantation (during 2008) has been registered as performed abroad – this transplantation is included here, but excluded in Table 12 below.

Tabel 5: Nyrediagnoser / Renal Diagnoses

	1990-94		1995-99		2000-04		2005		2006		2007		2008	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Overall	1940	100	2735	100	3556	100	654	100	653	100	797	100	650	100
Renal diagnoses:														
Unknown	329	17.0	518	18.9	722	20.3	165	25.2	121	18.5	154	19.3	140	21.5
Glomerulo-nephritis	323	16.6	388	14.2	362	10.2	66	10.1	68	10.4	79	9.9	53	8.2
Chronic interstitial	288	14.8	349	12.8	393	11.1	60	9.2	71	10.9	89	11.2	62	9.5
Cystic	184	9.5	206	7.5	226	6.4	37	5.7	57	8.7	48	6.0	31	4.8
Hereditary	40	2.1	39	1.4	43	1.2	5	0.8	2	0.3	7	0.9	13	2.0
Vascular & Hypertensive	189	9.7	269	9.8	443	12.5	82	12.5	77	11.8	99	12.4	95	14.6
Vasculitis	45	2.3	123	4.5	102	2.9	18	2.8	18	2.8	10	1.3	13	2.0
Diabetes	382	19.7	601	22.0	815	22.9	160	24.5	156	23.9	185	23.2	152	23.4
Systemic	119	6.1	178	6.5	224	6.3	33	5.0	34	5.2	58	7.3	36	5.5
Other	41	2.1	64	2.3	226	6.4	28	4.3	49	7.5	68	8.5	55	8.5

Tabel 6: Aldersfordeling / Age distribution

	1990-94		1995-99		2000-04		2005		2006		2007		2008	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Overall	1940	100.0	2735	100.0	3556	100.0	654	100.0	653	100.0	797	100.0	650	100.0
Age groups														
0-19	56	2.9	62	2.3	62	1.7	11	1.7	17	2.6	18	2.3	13	2.0
20-29	128	6.6	133	4.9	104	2.9	10	1.5	13	2.0	15	1.9	16	2.5
30-39	200	10.3	226	8.3	209	5.9	37	5.7	33	5.1	46	5.8	24	3.7
40-49	323	16.6	356	13.0	369	10.4	56	8.6	65	10.0	74	9.3	61	9.4
50-59	410	21.1	503	18.4	614	17.3	131	20.0	97	14.9	133	16.7	95	14.6
60-69	486	25.1	700	25.6	916	25.8	169	25.8	168	25.7	193	24.2	161	24.8
70-79	324	16.7	664	24.3	966	27.2	173	26.5	178	27.3	194	24.3	181	27.8
>= 80	13	0.7	91	3.3	316	8.9	67	10.2	82	12.6	124	15.6	99	15.2

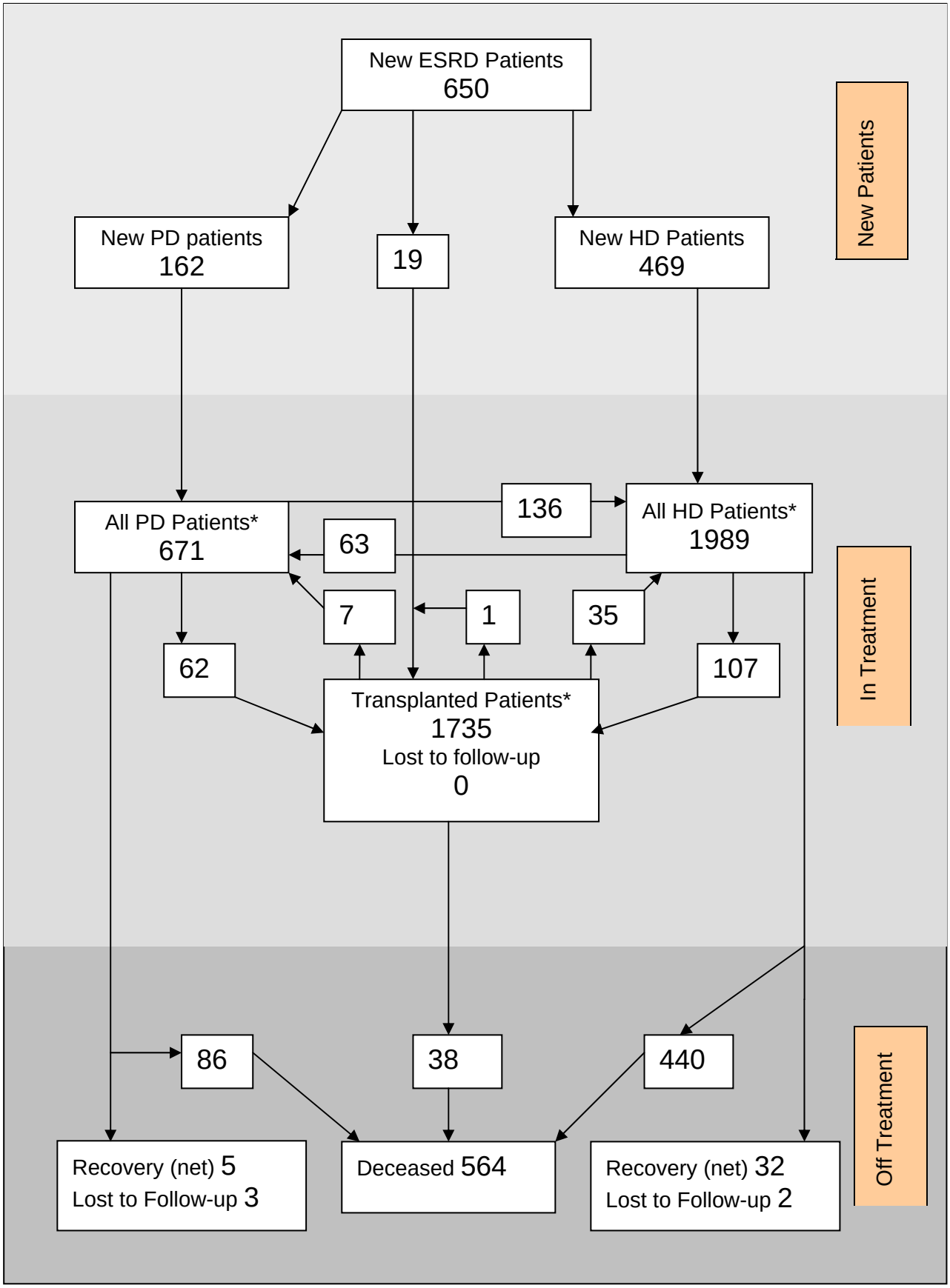


Fig. 1. Ændringer I behandlingsmodalitet / Changes in treatment modality 2008 *:Status pr. 31.12.2007

Tabel 7: Primær behandlingmodalitet / Primary treatment modality 1990-2008

		1990-94	1995-99	2000-04	2005	2006	2007	2008
Denmark	Total	1940	2735	3556	654	653	797	650
	HD	1082	1846	2465	444	429	524	469
	PD	738	783	1010	196	207	244	162
	TX	120	106	81	14	17	29	19
Centres:								
Rigshospitalet (RH)*	Total	500	652	720	91	111	128	99
	HD	223	490	567	76	78	95	77
	PD	256	141	142	13	31	26	18
	TX	21	21	11	2	2	7	4
Hvidovre	Total	211	134					
	HD	167	102					
	PD	44	32					
Herlev*	Total	214	299	367	67	49	73	63
	HD	67	143	227	45	32	56	39
	PD	126	133	113	18	16	15	18
	TX	21	23	27	4	1	2	6
Hillerød	Total			198	47	39	53	52
	HD			130	38	25	39	51
	PD			68	9	14	14	1
Roskilde	Total	27	97	116	26	26	38	31
	HD	20	70	64	15	20	21	18
	PD	7	27	52	11	6	17	13
Holbæk	Total	1	106	184	30	44	49	42
	HD	1	76	138	26	34	34	37
	PD	0	30	46	4	10	15	5
Nykøbing F	Total	1		19	18	24	24	21
	HD	1		19	13	18	16	18
	PD	0		0	5	6	8	3
Rønne	Total		4	8	2	6		
	HD		4	8	2	6		

* Centres are current transplantation centres as well.

(Table cont.)

Tabel 7 fortsat

		1990-94	1995-99	2000-04	2005	2006	2007	2008
Centres:								
Odense*	Total	225	233	307	63	56	85	50
	HD	91	107	227	40	37	67	36
	PD	96	89	64	19	13	12	10
	TX	38	37	16	4	6	6	4
Sønderborg	Total		130	126	49	50	42	26
	HD		96	83	19	26	26	17
	PD		34	43	30	24	16	9
Esbjerg	Total	66	98	145	20	24	26	22
	HD	28	58	85	13	14	14	11
	PD	38	40	60	7	10	12	11
Fredericia	Total	100	153	233	41	31	52	36
	HD	66	97	152	25	20	32	24
	PD	34	56	81	16	11	20	12
Holstebro	Total	74	132	158	40	33	31	31
	HD	51	94	133	34	27	24	23
	PD	23	38	25	6	6	7	8
Skejby*	Total	250	343	553	91	81	99	93
	HD	133	225	308	49	38	42	57
	PD	77	93	218	38	35	43	31
	TX	40	25	27	4	8	14	5
Viborg	Total	97	111	137	24	17	27	29
	HD	81	88	86	12	11	13	18
	PD	16	23	51	12	6	14	11
Aalborg	Total	174	243	285	45	62	70	55
	HD	153	196	238	37	43	45	43
	PD	21	47	47	8	19	25	12

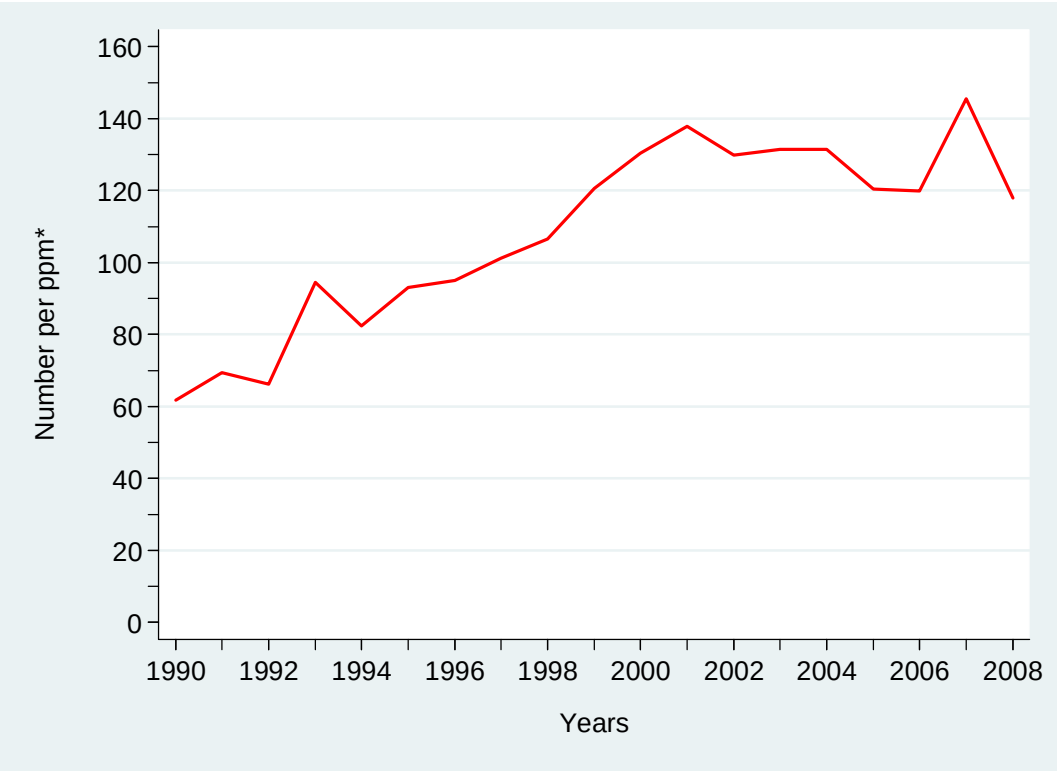
* Centres are current transplantation centres as well.

Notes to table:

HD Hemodialysis, PD Peritoneal dialysis, TX transplantation

Treatment rows are only presented if a centre had at least one patient in this category (during the time period considered).

Fig. 2: ESRD Incidens / ESRD Incidence 1990-2008



* Number per million

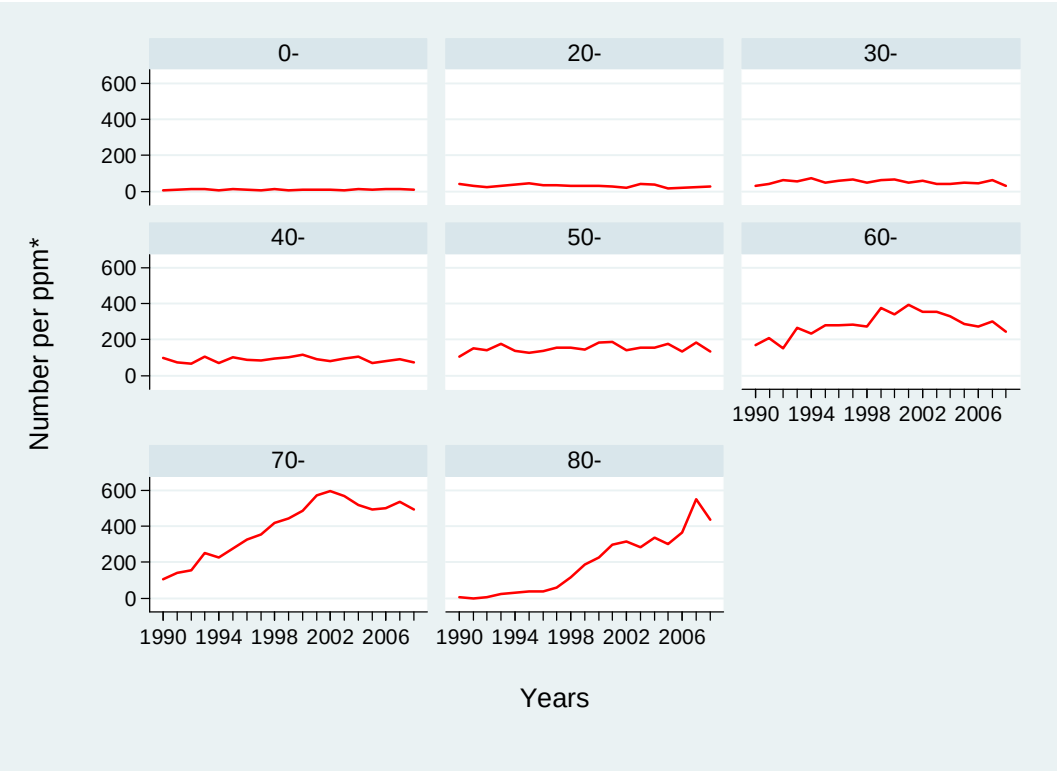
	1990-94		1995-99		2000-04		2005		2006		2007		2008	
	N/yr	Pop*	N/yr	pop	N	pop	N	pop	N	pop	N	pop	N	pop
Total Denmark	388	5.18	547	5.29	711	5.38	654	5.43	653	5.45	797	5.48	650	5.51

Pop: population in millions

Notes:

Population data from *Danmarks Statistik* were downloaded May 14, 2009. Data of new ESRD patients in a given year (during 2005, say) are set in relation to population data of January 1, the following year (that is, January 1, 2006). Note that the population number comprises people who are registered in Denmark (not including Greenland).

Fig. 3: Aldersfordelt Incidens / Incidence by age group 1990-2008



* ppm: population per million

Notes:

Population data from *Danmarks Statistik* were downloaded May 14, 2009. Data of new ESRD patients in a given year (during 2005, say) are set in relation to population data of January 1, the following year (that is, January 1, 2006). Note that the population number comprises people who are registered in Denmark (not including Greenland). Age categories are named after the first included age, and a category ends before the next category begins (example: "20-" ranges from 20 to 39 years).

Tabel 8: Aldersfordeling og nyrediagnoser / Age distribution and renal diagnoses 2008

	0-19	20-29	30-39	40-49	50-59	60-69	70-79	>= 80	Total
Overall	13	16	24	61	95	161	181	99	650
Renal diagnoses:									
Unknown cause	4	2	3	6	17	25	48	35	140
Glomerulonephritis	0	5	6	11	8	7	11	5	53
Chronic interstitial	1	0	4	1	7	20	21	8	62
Cystic	0	0	1	11	9	5	5	0	31
Hereditary	5	1	1	2	1	3	0	0	13
Vascular & Hypertensive	0	3	2	4	15	27	24	20	95
Vasculitis	1	0	0	1	2	3	4	2	13
Diabetes	0	2	6	20	21	47	43	13	152
Systemic	0	1	1	3	6	9	10	6	36
Other	2	2	0	2	9	15	15	10	55

Tabel 9: Behandlingsændringer efter center / Treatment Changes by centre 2008

	Number of patients with treatment changes during 2008							Treatment at end of 2008		
	HD-PD	HD-TX	PD-HD	PD-TX	TX-HD	TX-PD	TX-TX	HD	PD	TX
Denmark	83	105	133	66	32	7	1	2001	616	1830
Centres:										
Rigshospitalet (RH)*	19	33	17	15	3	2		281	70	511
Herlev*	7	9	12	9	7	1	1	166	53	265
Hillerød	7		10					179	33	0
Roskilde	1		4					64	48	31
Holbæk	12		2					113	40	24
Nykøbing F	1		5					85	16	0
Rønne								23	0	0
Odense*	3	28	11	13	4	1		178	41	318
Sønderborg			6					93	41	4
Esbjerg	2		10					77	37	5
Fredericia	5		2		3			102	55	54
Holstebro	2		3		1			92	20	93
Skejby*	4	37	21	25	8	2		272	85	315
Viborg	2		9		2	2		75	30	88
Aalborg	18		21		4			201	47	121

* Centres are current transplantation centres as well.

Notes to table:

If there was a move from one centre to another together with a treatment shift, the receiving department is listed.

One transplantation has been registered as performed abroad – this observation is excluded here, yielding a total of 1,830 transplantations (compared to 1,831 in Table 3).

Tabel 10: Død, genvunden nyrefunktion og lost-to-followup / Death, recovery of function and lost-to-followup 2008

		HD	PD	TX	Overall
Denmark	Total	472	96	38	606
	Death	443	89	38	570
	RC	27	6	0	33
	LTFU	2	1	0	3
Centres:					
Rigshospitalet (RH)*	Total	78	8	10	96
	Death	77	8	10	95
	LTFU	1	0	0	1
Herlev*	Total	49	10	9	68
	Death	45	9	9	63
	RC	3	0	0	3
	LTFU	1	1	0	2
Hillerød	Total	47	4		51
	Death	45	4		49
	RC	2	0		2
Roskilde	Total	15	9		24
	Death	15	9		24
Holbæk	Total	21	4		25
	Death	18	4		22
	RC	3	0		3
Nykøbing F	Total	8	3		11
	Death	8	3		11
Odense*	Total	53	9	5	67
	Death	52	9	5	66
	RC	1	0	0	1
Sønderborg	Total	21	12		33
	Death	20	12		32
	RC	1	0		1
Esbjerg	Total	18	3		21
	Death	18	3		21
Fredericia	Total	26	6		32
	Death	24	6		30
	RC	2	0		2
Holstebro	Total	16	3		19
	Death	14	3		17
	RC	2	0		2
Skejby*	Total	51	12	14	77
	Death	48	9	14	71
	RC	3	3	0	6
Viborg	Total	17	6		23
	Death	16	4		20
	RC	1	2		3
Aalborg	Total	52	7		59
	Death	43	6		49
	RC	9	1		10

* Centres are current transplantation centres as well.

Notes to table:

HD Hemodialysis, PD Peritoneal dialysis, TX transplantation. LTFU covers both "Moved abroad" and "Lost-to-follow-up" from Table 4. The two patients in category "Graft loss" (Table 4) were in TX before (Herlev: 1, Skejby: 1).

Aldersfordeling: illustrationer / Age Distribution: Illustrations 1990-2007

Fig. 4. Den ældste patient / The oldest patient

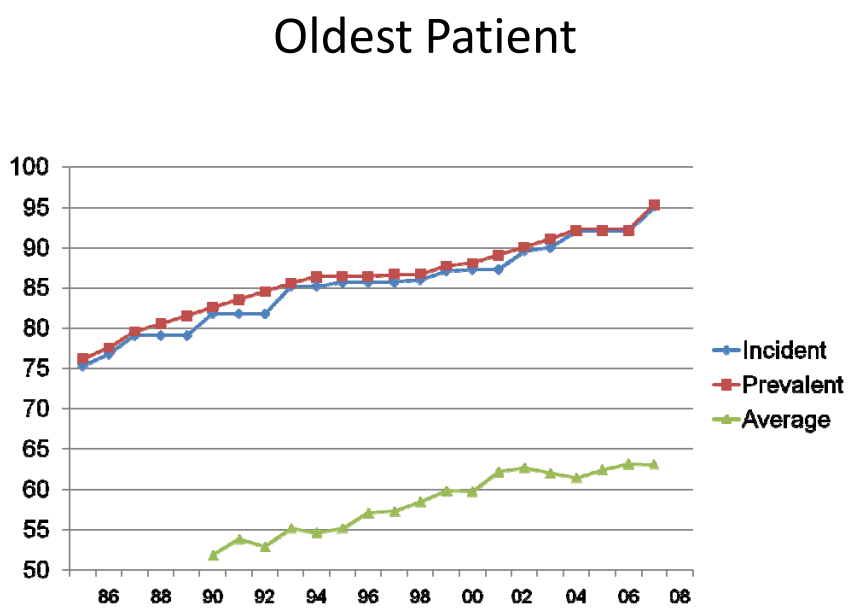


Fig. 5 Patientoverlevelse >90 år / Patient Survival >90 years

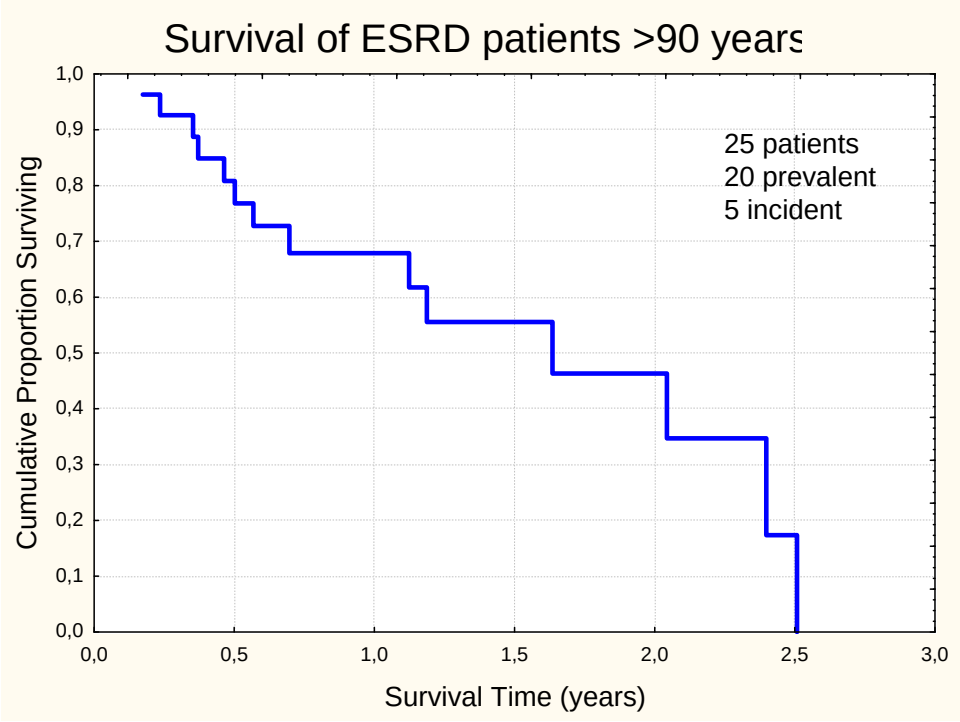


Fig. 6 Alder ved behandlingsstart / Age at treatment initiation.

Mens antallet af 80-årige er steget siden 2000, er der sket et bemærkelsesværdig fald i antallet af nye 60-årige med ESRD

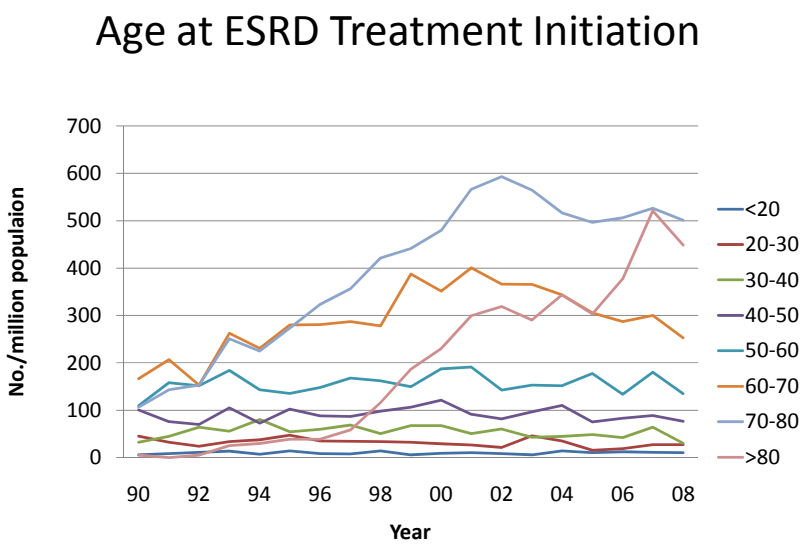
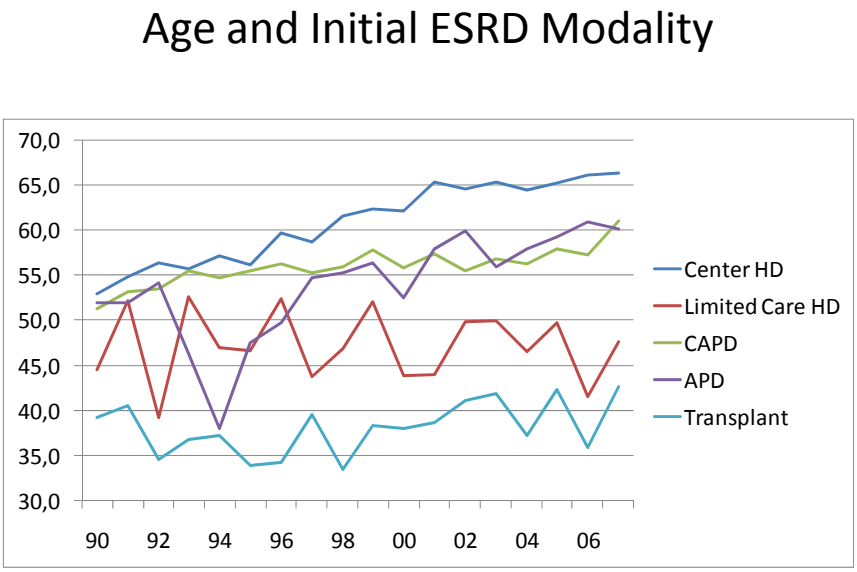


Fig. 7 Alder og initial behandlingsmodalitet / Age and initial treatment modality. Patienter som begynder ESRD behandling med transplantation eller limited care HD er generelt yngre.



Medianoverlevelse / Median Survival 1990-2007

Dotted lines: Prognosis.

Fig. 8. Alle patienter / All Patients (Dialysis + transplant, diabetic and non-diabetic)

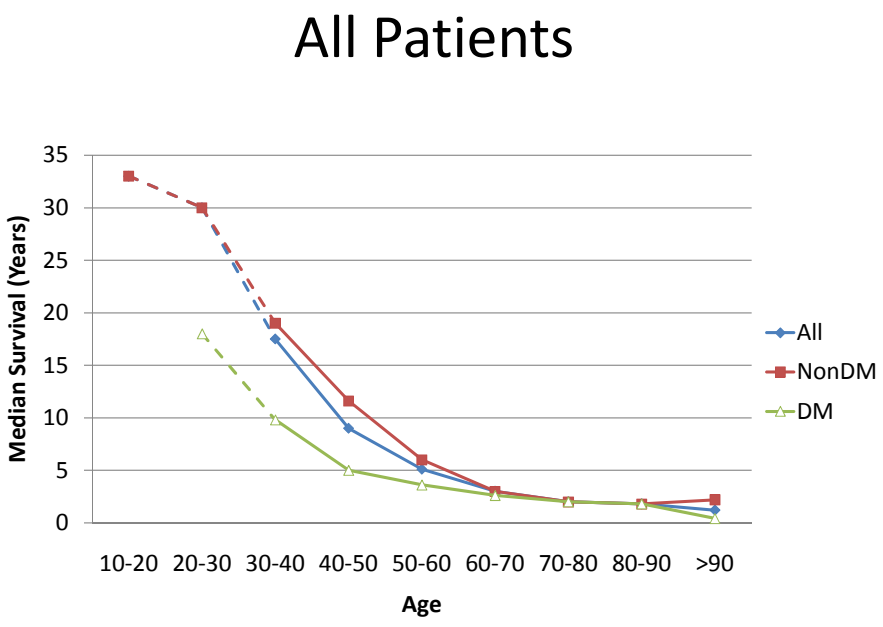


Fig. 9. Alle patienter: kohorte effekt / All patients: cohort effect

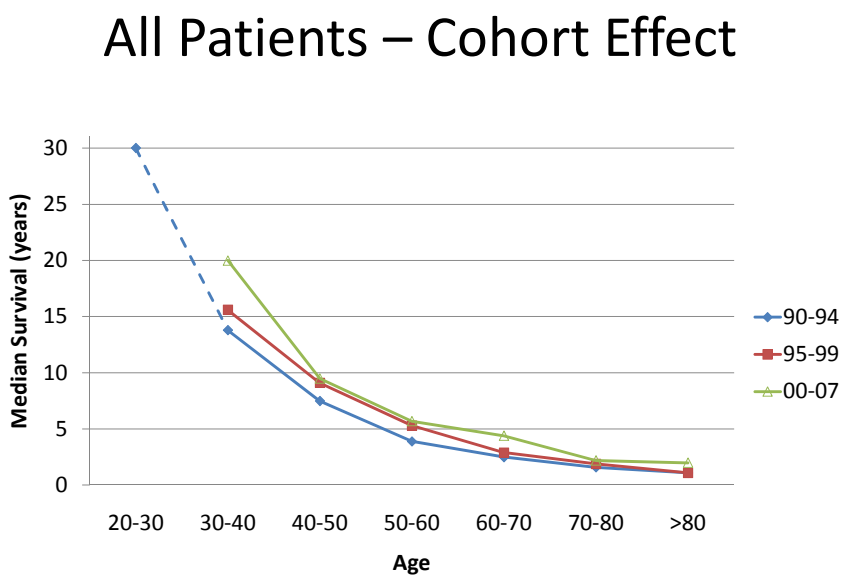


Fig. 10. Ikke-diabetiske patienter: kohorte effect / Nondiabetic patients: cohort effect

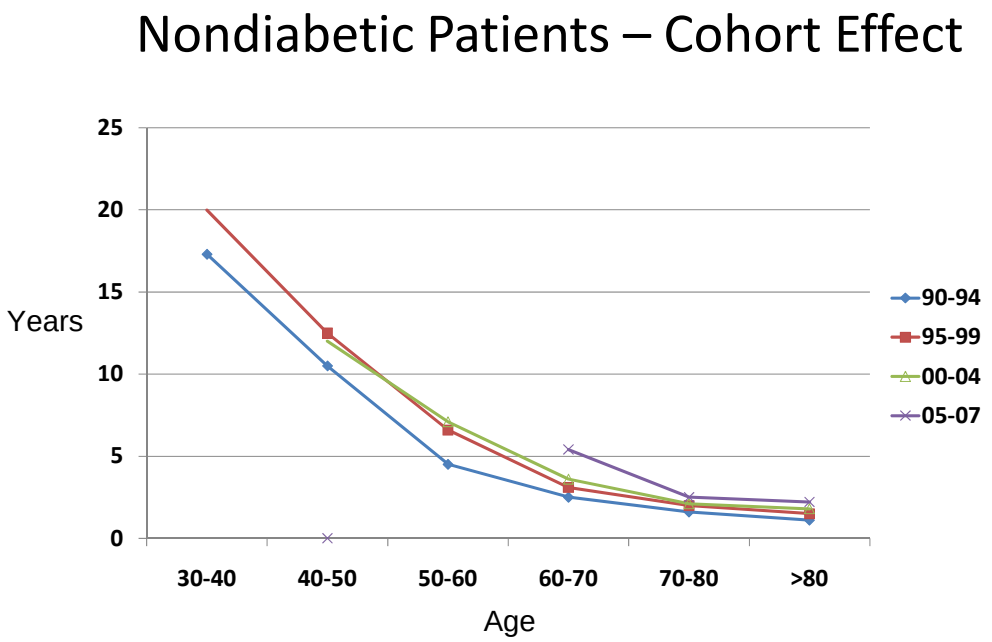


Fig. 11 Diabetiske patienter: kohorte effect / Diabetiske patienter cohort effect

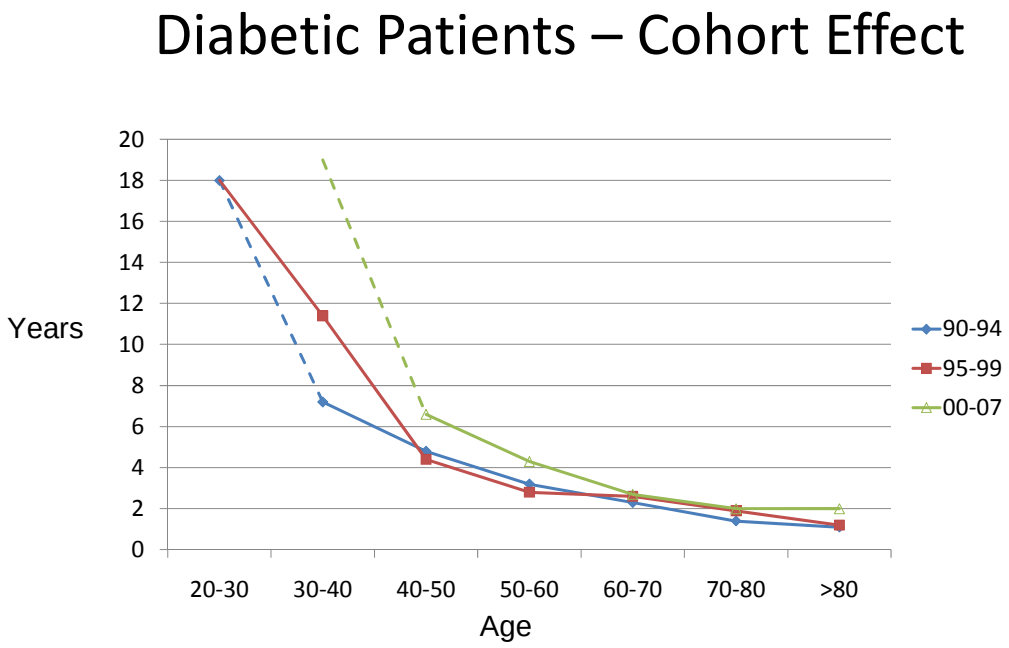


Fig. 12. Dialyseoverlevelse / Diaysis survival

Patients who never received a renal transplant.

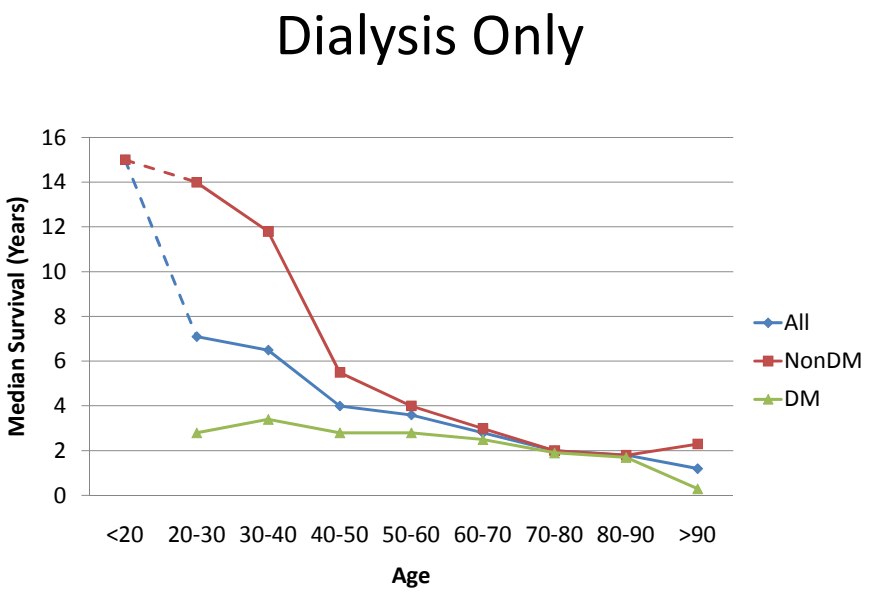


Fig. 13. Dialyseoverlevelse: kohorte effect / Dialysis survival: cohort effect

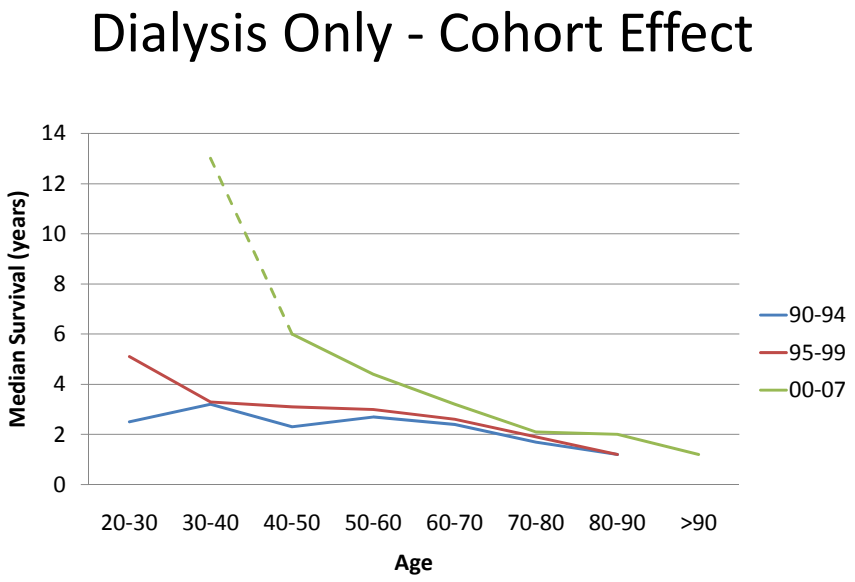


Fig. 14. Transplantoverlevelse / Transplant Survival.

Patients who received at least one renal transplant

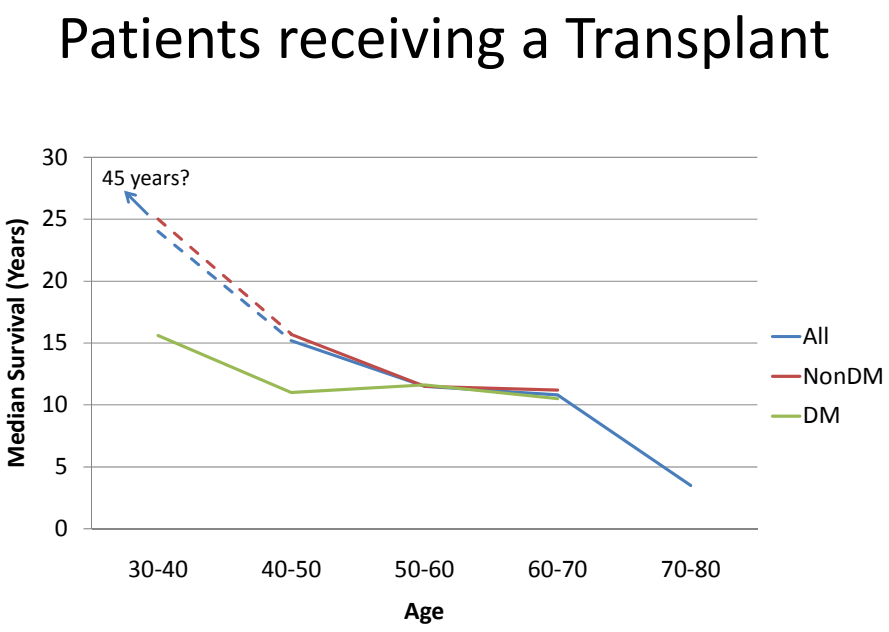
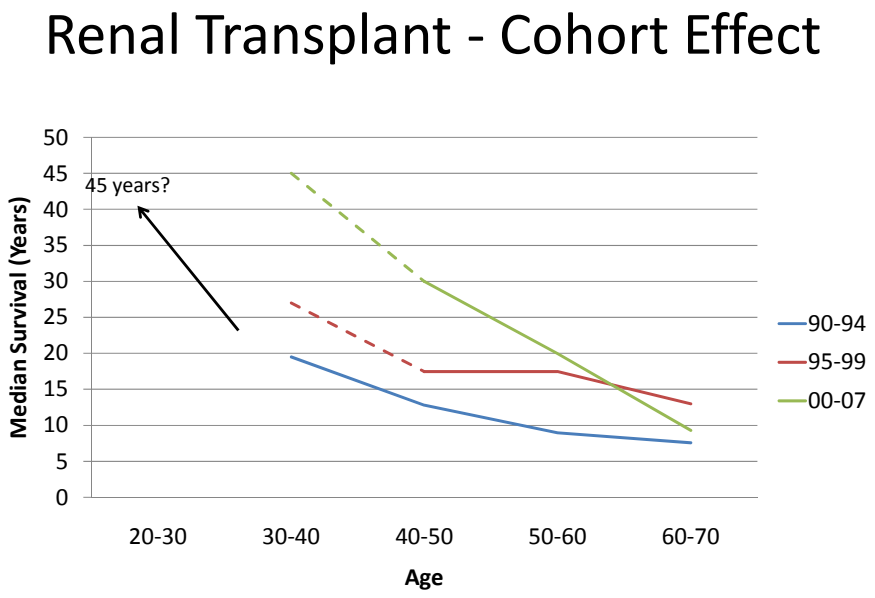


Fig. 15. Transplantoverlevelse:kohorte effect / Transplant survival: cohort effect



Renal Transplantation

Tabel 11: Renal transplantation 1990-2008

		1990-94		1995-99		2000-04		2005		2006		2007		2008	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
Overall		843	100	747	100	808	100	162	100	164	100	162	100	189	100
Source of donor	**TX number**														
Dead donor	1	500	59.3	449	60.1	490	60.6	92	56.8	88	53.7	89	54.9	93	49.2
	2	114	13.5	79	10.6	102	12.6	17	10.5	15	9.1	15	9.3	18	9,5
	3	21	2.5	22	2.9	16	2.0	4	2.5	2	1.2	2	1.2	3	1.6
	4	2	0.2	2	0.3	3	0.4	1	0.6	1	0.6	0	0.0	2	1.1
	5	1	0.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.6
Living donor	1	164	19.5	179	24.0	175	21.7	41	25.3	49	29.9	44	27.2	61	32,3
	2	31	3.7	15	2.0	18	2.2	7	4.3	9	5.5	11	6.8	9	4,8
	3	7	0.8	0	0.0	4	0.5	0	0.0	0	0.0	1	0.6	1	0.6
	4	3	0.4	1	0.1	0	0.0	0	0.0	0	0.0	0	0.0	1	0.6
	5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

Tabel 12 : Centreopgørelse / Transpantation by transplant center 2008

		Rigshospitalet	Herlev	Odense	Skejby	Overall Denmark
Overall		52	25	45	67	189
Source of donor	**Transplant number**					
Dead donor	1	30	15	10	38	93
	2	5	3	2	8	18
	3	1	1	0	1	3
	4	0	0	1	1	2
	5	1	0	0	0	1
Living donor	1	13	4	27	17	61
	2	2	2	2	2	8
	3	0	0	2	0	2
	4	0	0	1	0	1
	5	0	0	0	0	0

A further 3 patients without Danish CPR-numbers were transplanted at Rigshositalet.

Tabel 13: Levende donor forhold / Living donor relationship 1990-2008

		1990-94		1995-99		2000-04		2005		2006		2007		2008	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
Overall		205	100	195	100	197	100	48	100	58	100	56	100	72	100
Relationship	**Specifics**														
Parents		104	50.7	121	62.1	98	49.7	16	33.3	19	32.8	24	42.9	20	27.5
Siblings overall		79	38.6	54	27.7	49	24.8	11	22.9	14	24.1	18	32.1	19	26,4
	Identical twins	1	0.5	1	0.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	2 shared HT	41	20.0	26	13.3	18	9.1	5	10.4	7	12.1	4	7.1	3	4.1
	1 shared HT	32	15.6	23	11.8	27	13.7	6	12.5	6	10.3	11	19.6	14	19,4
	0 shared HT	4	2.0	4	2.1	4	2.0	0	0.0	1	1.7	3	5.4	2	2.7
	Unknown HT	1	0.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Other related		14	6.8	11	5.6	18	9.1	5	10.4	11	19.0	3	5.4	9	12,5
Unrelated		8	3.9	9	4.6	32	16.2	16	33.3	14	24.1	11	19.6	24	33,3

Tabel 14: Graftfunktion / Onset of graft function 1990-2008

	1990-94		1995-99		2000-04		2005		2006		2007		2008	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Overall	898	100	789	100	825	100	166	100	167	100	138	100	189	100
Days after TX														
0-4	621	69.1	608	77.1	695	84.2	128	77.1	145	86.8	104	75.3	164	86.7
5-9	74	8.2	43	5.5	37	4.5	4	2.4	9	5.4	7	5.1	3	1.6
10-14	61	6.8	44	5.6	18	2.2	6	3.6	3	1.8	5	3.6	2	1.1
15-19	29	3.2	19	2.4	9	1.1	4	2.4	3	1.8	3	2.2	2	1,1
20-50	45	5.0	34	4.3	34	4.1	10	6.0	2	1.2	11	7.9	9	4.8
>50	2	0.2	3	0.4	8	1.0	3	1.8	6	1.8	4	2.9	2	1,1
Never/Not yet	66	7.4	38	4.8	24	2.9	11	6.6	2	1.2	4	2.9	7	6,4

.

DNSL Indikatorer / Danish Nephrology Register Indicators

Introduktion

Som betingelse for at modtage økonomisk støtte fra Danske Regioner til drift af DNSL, er DNS forpligtet til at publicere årlige kvalitetsindikatorer for danske nefrologiske afdelinger. Det nye indikatorsæt gælder fra 1.1.2008, men data for Indikatorer 3-5 er tilgængelige retrospektivt. .

Datakomplethed

Datakomplethed hvad angår antallet af dialysepatienter og transplanterede patienter kan antages at være tæt på 100%. En nylig opgørelse (præsenteret ved DNS Årsmøde i Maj 2008) viser at >96% af patienter som har modtaget dialyse for mere end tre måneder i DRG registret fandtes også i DNSL. Løbende sammenligning af indholdet i DRG registret og DNSL, for at sikre 100% datavaliditet planlægges. Centralregistrering af patienter som modtager dialysebehandling i en kortere periode kan ikke bruges, da en del af disse behandles for akut, reversibel nyresvigt, som er registret uvedkommende. Enkelte patienter med kronisk uræmi, kort dialysevarighed og tidlig død kan være blevet fejlklassificeret som akut uræmi, og ikke registreret..
Datakomplethed for peritonitisfrekvens kan valideres ved at sammenligne med et udtræk fra de lokale mikrobiologiske afdelinger. Denne mulighed er endnu ikke tilgængelig.
Et enkelt center har ikke været i stand til at levere biokemiske data for 2008.
Patienter med ulogisk forløb er udelukket fra analysen. Det drejer sig om 16 (2,4%) patienter i 2008. 267 (2,6%) ud af 10335 nye patienter imellem 1990 og 2007 er også udelukket af samme grunde. I løbet af 2008 vil disse patientforløb blive revideret retrospektivt, hvorfor tallet forventes at blive betydelig lavere i årsrapporten for 2009.

Tabel 15: Indikator 1. Akut vs. rutine dialyseopstart / Acute versus routine start of dialysis.

	Patient Number	Routine Start in % (Confidence Interval)
Danmark	**598**	**48.0 (43.9-52.1)**
Rigshospitalet (RH)	85	36.5 (26.3-47.6)
Herlev	58	48.3 (35.0-61.8)
Hillerød	48	47.9 (33.3-62.8)
Roskilde	26	53.8 (33.4-73.4)
Holbæk	39	23.1 (11.1-39.3)
Nykøbing Falster	20	55.0 (31.5-76.9)
Rønne	-	-
Odense	45	42.2 (27.7-57.8)
Sønderborg	25	64.0 (42.5-82.0)
Esbjerg	22	59.1 (36.4-79.3)
Fredericia	36	58.3 (40.8-74.5)
Holstebro	30	40.0 (22.7-59.4)
Skejby	88	60.2 (49.2-70.5)
Viborg	24	62.5 (40.6-81.2)
Aalborg	52	42.3 (28.7-56.8)

Notes to table:

(1) Number of patients with first dialysis intervention in 2008 (date and place available)

(2) Specific criteria for data completeness:

1. First dialysis intervention reported to be as first,
2. Patient was not referred from abroad,
3. Questions with respect to *dialyseadgangsvej* were answered

(3) Actual number of patients with first dialysis intervention in year (and complete data)

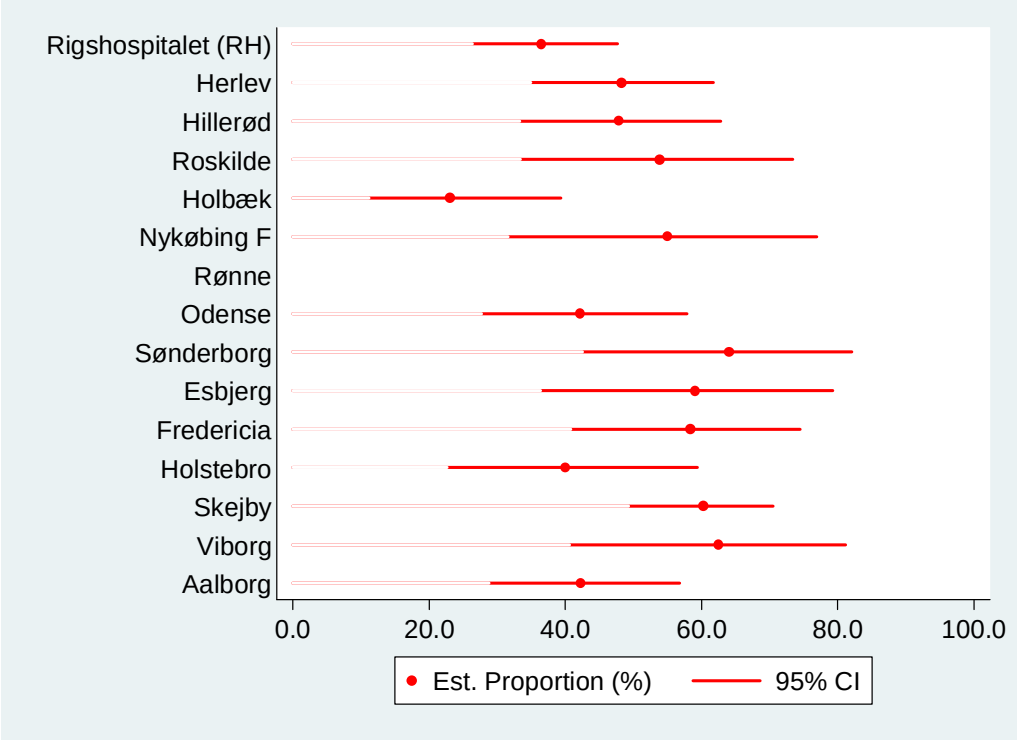
(4) Number of patients where (first) start of dialysis treatment was controlled/prepared

Note the following relations: (2) = (3) / (1) and (5) = (4) / (3).

95% exact binomial confidence intervals are calculated.

Valid data are available for 598/650 new dialysis patients in 2008 =92%

Fig. 16: Indikator 1. Akut vs. rutine dialyseopstart / Acute versus routine start of dialysis. Estimated proportions and 95% CI



Pearson's Chi-square test (29.5, *df* = 13) results in a *p*-value of 0.006.

Table 16: Indikator 2. Tidlig henvisning / Early Referral

Early referral = Referral to nephrology department >16 weeks before start of active therapy. Numbers of patients are presented unless indicated otherwise. Valid data are available for 601/650 new dialysis patients =92%

	Patient Number	Early Referral in % (Confidence Interval)
Danmark	**601**	**63.2 (59.2-67.1)**
Rigshospitalet (RH)	93	73.1 (62.9-81.8)
Herlev	57	78.9 (66.1-88.6)
Hillerød	33	24.2 (11.1-42.3)
Roskilde	31	51.6 (33.1-69.8)
Holbæk	42	52.4 (36.4-68.0)
Nykøbing Falster	21	52.4 (29.8-74.3)
Rønne	-	-
Odense	44	61.4 (45.5-75.6)
Sønderborg	26	65.4 (44.3-82.8)
Esbjerg	21	71.4 (47.8-88.7)
Fredericia	36	74.2 (55.4-88.1)
Holstebro	31	75.0 (57.8-87.9)
Skejby	88	67.0 (56.2-76.7)
Viborg	29	48.3 (29.4-67.5)
Aalborg	49	57.1 (42.2-71.2)

Notes to table:

(1) Number of patients with first dialysis intervention in 2008 (date and place available)

(2) Specific criteria for data completeness:

1. Date of *foerstejournalnotat* is available
2. This date is not after date of first (dialysis) intervention

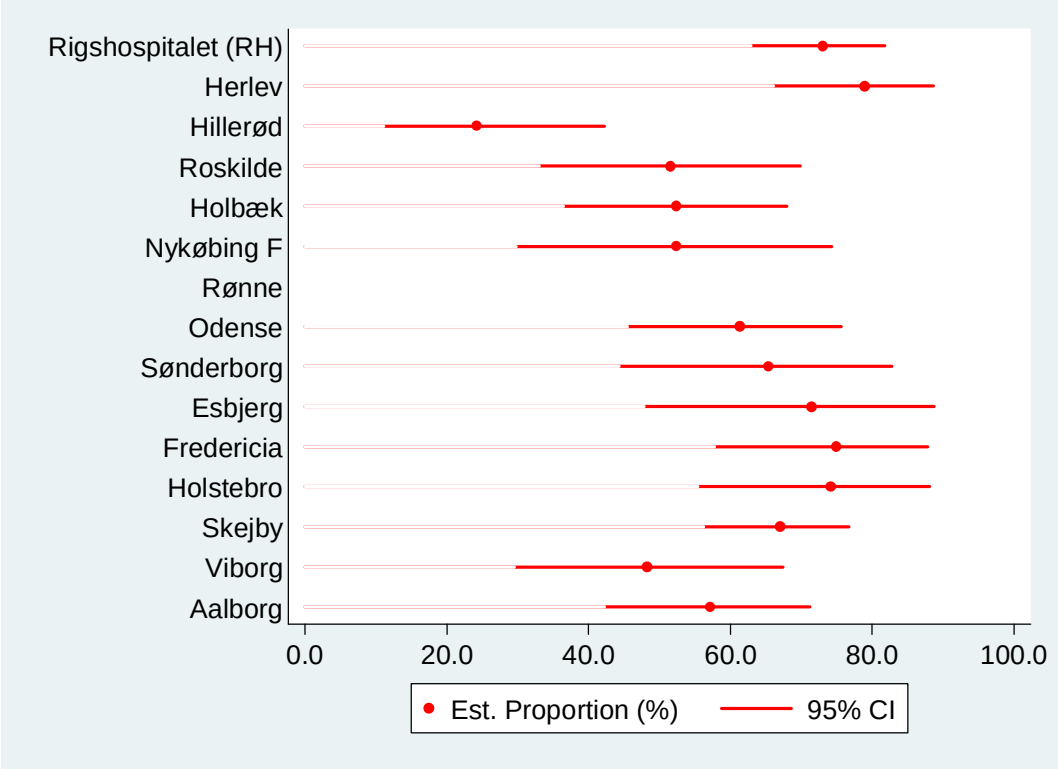
(3) Actual number of patients with first dialysis intervention in year (and complete data)

(4) Number of patients where (first) start of dialysis treatment was at least 16 weeks after first date of *foerstejournalnotat*

Note the following relations: (2) = (3) / (1) and (5) = (4) / (3).

95% exact binomial confidence intervals are calculated.

Fig. 17. Indikator 2. Tidlig henvisning / Early referral. Estimated proportions and 95% CI.



Pearson's Chi-square test (45.1, *df* = 13) results in a *p*-value < 0.001, i.e. ther is a significant centre effect.

Tabel 17. Indikatorer 1 & 2 kombinerede / Cross-tabulation of Indicator 1 & 2.

Numbers of patients and cell percentages are presented. 565 patients had valid observations for both indicator 1 and 2.

Indicator 1	**Indicator 2**		
Routine Start	**Early Referral**		
	Early Referral (>16 weeks before RRT)	Late Referral (<16 weeks before RRT)	**Total**
Acute Start	140 (25%)	158 (28%)	298 (53%)
Routine Start	222 (39%)	45 (8%)	267 (47%)
Total	362 (64%)	203 (36%)	565 (100%)

Tabel 18: Indikator 3. Mortalitet / Overall mortality rate

Denmark, overall treatment	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
Data basis in year (1)	1674	1815	1925	2060	2212	2341	2466	2652	2764	2967	3182	3402	3598	3783	3937	4027	4115	4274	4413
Number of deaths in year (2)	166	209	267	294	309	355	331	375	398	408	468	479	513	527	543	551	547	539	564
Estimated rate (%) (3)	9.9	11.5	13.9	14.3	14.0	15.2	13.5	14.1	14.4	13.7	14.7	14.1	14.2	13.9	13.8	13.7	13.3	12.6	12.8
Lower 95% CI	9.8	11.4	13.7	14.1	13.8	15.0	13.3	14.0	14.2	13.6	14.6	13.9	14.1	13.8	13.7	13.6	13.2	12.5	12.7
Upper 95% CI	10.1	11.7	14.1	14.4	14.1	15.3	13.6	14.3	14.5	13.9	14.9	14.2	14.4	14.0	13.9	13.8	13.4	12.7	12.9

Notes to table: (1) Total amount of contributed years in treatment (2) Total number of deaths in year (3) Estimated mortality rate per year. Note the following relations: (3) = (2) / (1).95% exact Poisson confidence intervals are calculated.
Inclusion criteria specific for Indicator 3:

1. Information about starting/ending date for each course of treatment is required,
2. Course of treatment can be identified,
3. Negative time periods are not allowed.

Tabel 19: Indicator 3. Mortalitet efter behandlingsmodalitet / Mortality rates per treatment modality

HD	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
Data basis in year	594	623	643	697	770	836	925	1042	1130	1271	1396	1541	1666	1763	1808	1861	1880	1939	1990
Number of deaths in year	108	131	144	190	187	232	240	252	279	298	359	362	402	417	416	408	405	426	440
Estimated rate (%)	18.2	21.0	22.4	27.2	24.3	27.8	26.0	24.2	24.7	23.4	25.7	23.5	24.1	23.6	23.0	21.9	21.5	22.0	22.1
Lower 95% CI	17.8	20.6	22.1	26.8	23.9	27.4	25.7	23.9	24.4	23.2	25.5	23.2	23.9	23.4	22.8	21.7	21.3	21.8	22.0
Upper 95% CI	18.5	21.4	22.8	27.6	24.6	28.1	26.3	24.5	25.0	23.7	26.0	23.7	24.4	23.9	23.3	22.1	21.7	22.2	22.4
PD	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
Data basis in year	289	357	373	379	410	414	429	451	455	493	524	568	591	603	627	613	622	645	647
Number of deaths in year	31	47	75	62	77	76	58	67	83	70	78	76	72	71	89	90	93	83	86
Estimated rate (%)	10.7	13.2	20.1	16.4	18.8	18.4	13.5	14.9	18.2	14.2	14.9	13.4	12.2	11.8	14.2	14.7	14.9	12.9	13.3
Lower 95% CI	10.3	12.8	19.7	15.9	18.4	17.9	13.2	14.5	17.8	13.9	14.6	13.1	11.9	11.5	13.9	14.4	14.6	12.6	13.0
Upper 95% CI	11.1	13.6	20.6	16.8	19.2	18.8	13.9	15.2	18.6	14.5	15.3	13.7	12.5	12.0	14.5	15.0	15.2	13.1	13.6
TX	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
Data basis in year	791	835	909	983	1033	1091	1112	1160	1179	1203	1262	1293	1341	1416	1502	1554	1612	1691	1777
Number of deaths in year	27	31	48	42	45	47	33	56	36	40	31	41	39	39	38	53	49	30	38
Estimated rate (%)	3.4	3.7	5.3	4.3	4.4	4.3	3.0	4.8	3.1	3.3	2.5	3.2	2.9	2.8	2.5	3.4	3.0	1.8	2.1
Lower 95% CI	3.3	3.6	5.1	4.1	4.2	4.2	2.9	4.7	3.0	3.2	2.4	3.1	2.8	2.7	2.5	3.3	3.0	1.7	2.1
Upper 95% CI	3.5	3.8	5.4	4.4	4.5	4.4	3.1	5.0	3.2	3.4	2.5	3.3	3.0	2.8	2.6	3.5	3.1	1.8	2.2

Tabel 20: Indikator 4a. Et-års graftoverlevelse / One-year graft survival

Denmark	1990-94	1995-99	2000-04	2005	2006	2007
Data basis (1)	843	747	804	162	164	162
Data completeness (%) (2)	100.0	100.0	100.0	100.0	100.0	100.0
Actual data basis (3)	843	747	804	162	164	162
Meeting indicator criteria (4)	661	626	731	147	154	153
Estimated proportion (5)	78.4	83.8	90.9	90.7	93.9	94.4
Lower 95% CI	75.5	81.0	88.7	85.2	89.1	89.7
Upper 95% CI	81.1	86.4	92.8	94.7	97.0	97.4

Notes to table:

(1) Number of renal transplantations in Denmark after January 1, 1990

(2) Specific criteria for data completeness:

1. At least 1 year (365 days) follow-up time,
2. Observations are exclude if a registered graft loss has no corresponding date,
3. Negative time periods are not allowed,
4. Questions about type of donor kidney are answered

(3) Actual number of renal transplantations in Denmark (and complete data)

(4) Number of transplantations with graft in function more than 1 year

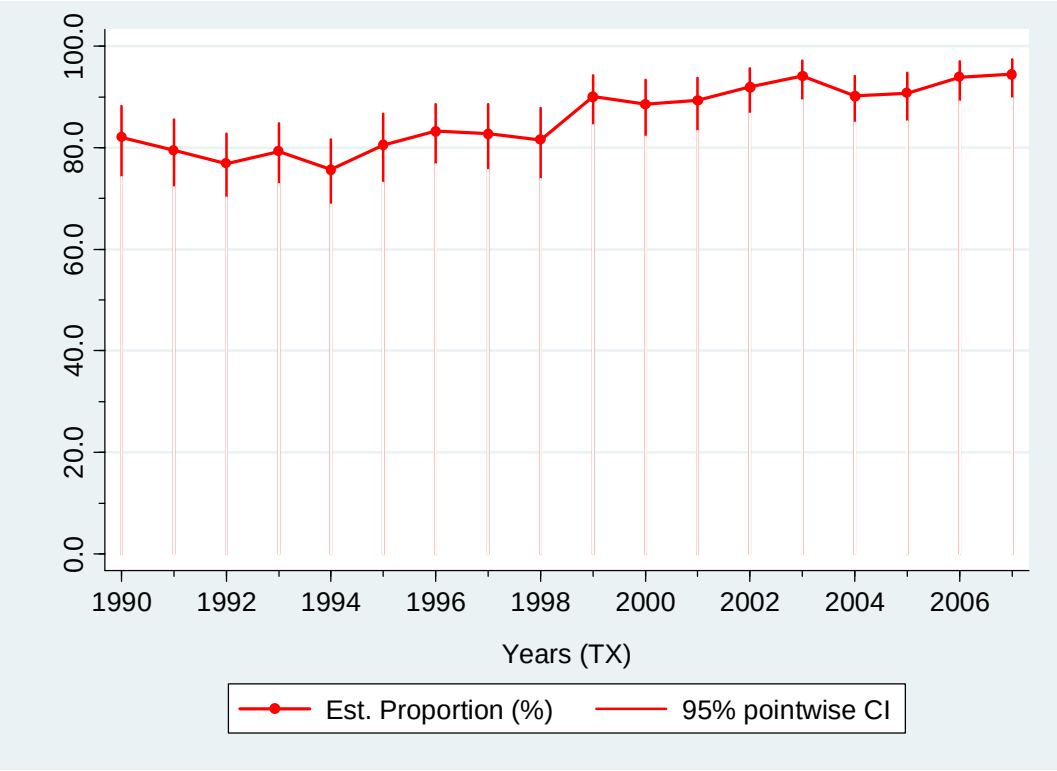
Note the following relations: (2) = (3) / (1) and (5) = (4) / (3).

95% exact binomial confidence intervals are calculated.

Additional exclusion criteria (observations are not included in Data basis)

1. Patient was not referred to abroad
2. Patients “ude af system”/out of system are not included
3. If patients have two renal transplantations in a row (with no registered graft loss in between), only the second renal transplantation is taken into consideration
4. If patients have two registered graft losses in a row (with no registered renal transplantation in between), only the first graft loss is taken into consideration

Fig. 18: Et-års graftoverlevelse / one-year graft survival. Estimated proportions and 95% CI.

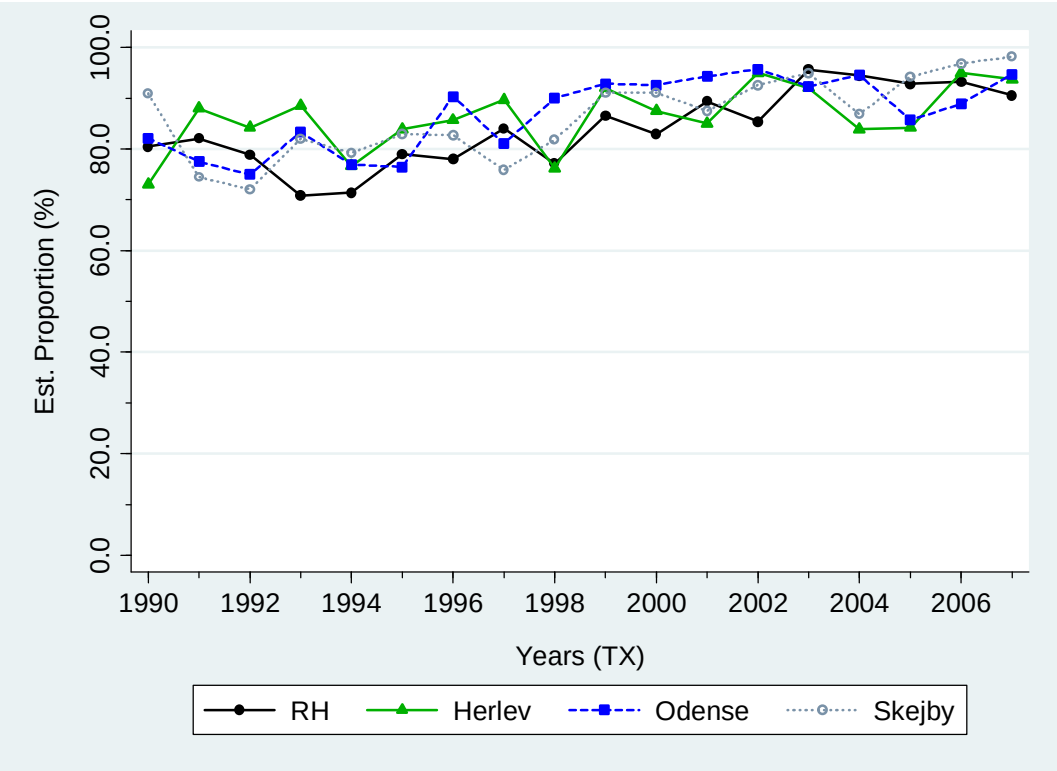


Tabel 21: Et-års graftoverlevelse efter center / One-year graft survival per centre

Rigshospitalet (RH)*	**1990-94**	**1995-99**	**2000-04**	**2005**	**2006**	**2007**
Data basis	267	225	229	56	44	53
Data completeness (%)	100.0	100.0	100.0	100.0	100.0	100.0
Actual data basis	267	225	229	56	44	53
Meeting indicator criteria	202	183	206	52	41	48
Estimated proportion	75.7	81.3	90.0	92.9	93.2	90.6
Lower 95% CI	70.1	75.6	85.3	82.7	81.3	79.3
Upper 95% CI	80.7	86.2	93.5	98.0	98.6	96.9
Herlev	**1990-94**	**1995-99**	**2000-04**	**2005**	**2006**	**2007**
Data basis	154	134	112	19	20	16
Data completeness (%)	100.0	100.0	100.0	100.0	100.0	100.0
Actual data basis	154	134	112	19	20	16
Meeting indicator criteria	127	115	99	16	19	15
Estimated proportion	82.5	85.8	88.4	84.2	95.0	93.8
Lower 95% CI	75.5	78.7	81.0	60.4	75.1	69.8
Upper 95% CI	88.1	91.2	93.7	96.6	99.9	99.8
Odense	**1990-94**	**1995-99**	**2000-04**	**2005**	**2006**	**2007**
Data basis	171	160	185	35	36	38
Data completeness (%)	100.0	100.0	100.0	100.0	100.0	100.0
Actual data basis	171	160	185	35	36	38
Meeting indicator criteria	135	137	174	30	32	36
Estimated proportion	78.9	85.6	94.1	85.7	88.9	94.7
Lower 95% CI	72.1	79.2	89.6	69.7	73.9	82.3
Upper 95% CI	84.8	90.7	97.0	95.2	96.9	99.4
Skejby	**1990-94**	**1995-99**	**2000-04**	**2005**	**2006**	**2007**
Data basis	251	228	278	52	64	55
Data completeness (%)	100.0	100.0	100.0	100.0	100.0	100.0
Actual data basis	251	228	278	52	64	55
Meeting indicator criteria	197	191	252	49	62	54
Estimated proportion	78.5	83.8	90.6	94.2	96.9	98.2
Lower 95% CI	72.9	78.3	86.6	84.1	89.2	90.3
Upper 95% CI	83.4	88.3	93.8	98.8	99.6	100.0

Fig. 19 Et-års graftoverlevelse efter center / One-year graft survival by centre.

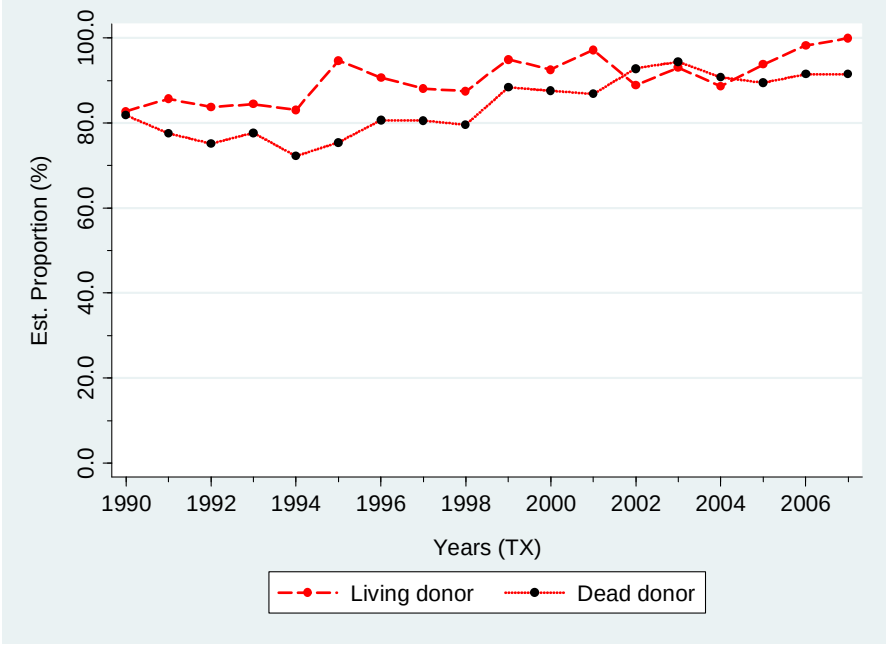
Estimated proportions and 95% CI



A binomial logistic model is fitted for the expected number of successes (that is, one-year graft survival) with *centre* and *years* as categorical covariates. In order to take into account that more than one transplantation per patient might have been included, a robust variance estimator is used. There is no significant difference between the centres. (*p*-value of overall Wald test: 0.2835). The (single) effects (odds ratios) of each centre against the others are estimated as follows:

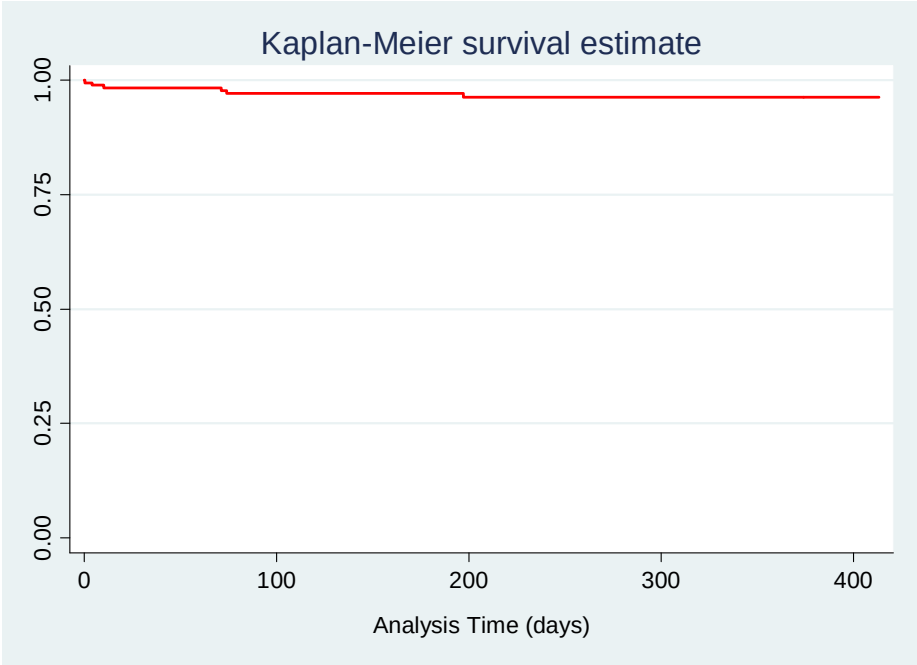
Centre	Est. effect (odds ratio)	95% CI	*P*-value
Herlev vs. Rigshospitalet RH	1.28	0.92 - 1.78	0.145
Odense vs. Rigshospitalet RH	1.27	0.94 - 1.72	0.117
Skejby vs. Rigshospitalet RH	1.22	0.93 - 1.60	0.148
Odense vs. Herlev	1.04	0.69 - 1.43	0.979
Skejby vs. Herlev	1.00	0.68 - 1.35	0.794
Skejby vs. Odense	0.96	0.71 - 1.30	0.794

Fig. 20: Et-års graftoverlevelse. Donor effect / One-year graft survival. Donor effect.



The effect (odds ratio) of donor relation, treating dead donor as default, is estimated as 1.84 (95% CI: 1.40 – 2.42). The resulting *p*-value of the corresponding Wald test is < 0.001.

Fig. 21. Graftoverlevelse / Graft survival 2008



There were 5 graft losses and 1 death of a patient for 179 transplantations in 2008 (until February 23, 2009). The one-year graft survival probability is estimated as 96.2% (95% CI: 91.6 – 98.3).

Tabel 22: Indikator 4b. 5-års graftoverlevelse / 5-year graft survival

Denmark	1990-94	1995-99	2000	2001	2002	2003
Data basis (1)	841	747	139	149	162	169
Data completeness (%) (2)	100.0	99.9	100.0	100.0	100.0	100.0
Actual data basis (3)	841	746	139	149	162	169
Meeting indicator criteria (4)	478	502	109	110	132	134
Estimated proportion (5)	56.8	67.3	78.4	73.8	81.5	79.3
Lower 95% CI	53.4	63.8	70.6	66.0	74.6	72.4
Upper 95% CI	60.2	70.7	84.9	80.7	87.1	85.1

Notes to table:

(1) Number of renal transplantations in Denmark after January 1, 1990

(2) Specific criteria for data completeness:

1. At least 5 years (1825 days) follow-up time,
2. Observations are exclude if a registered graft loss has no corresponding date,
3. Negative time periods are not allowed,
4. Questions about type of donor kidney are answered

(3) Actual number of renal transplantations in Denmark (and complete data)

(4) Number of transplantations with graft in function more than 5 years

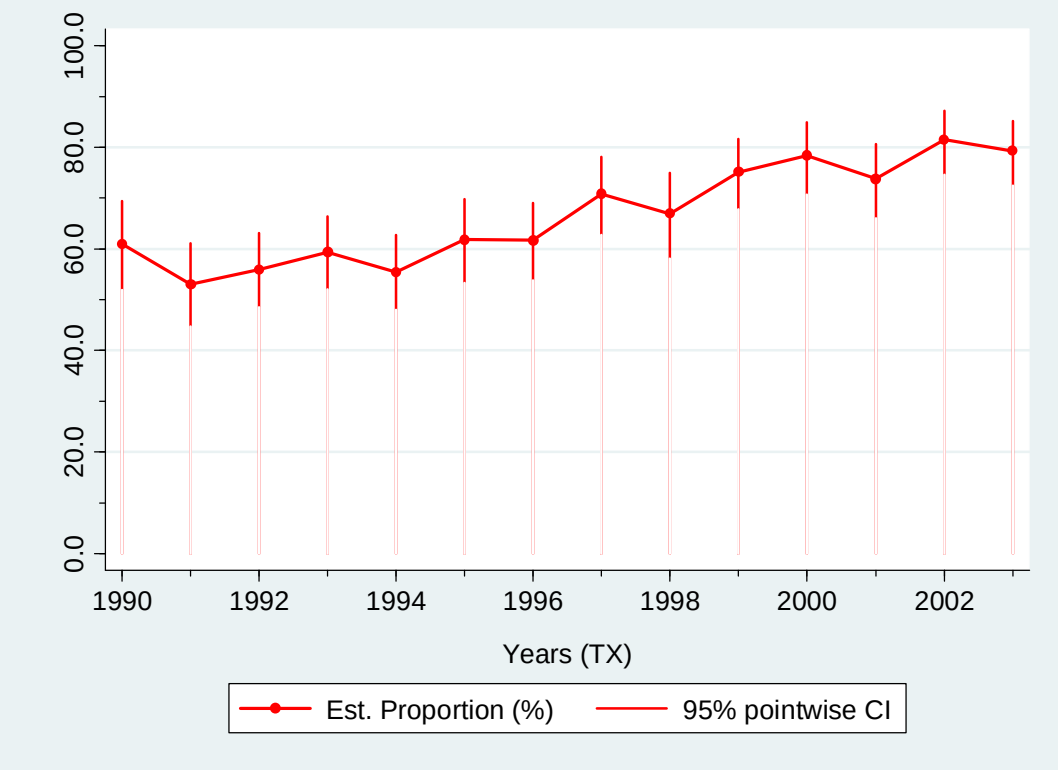
Note the following relations: (2) = (3) / (1) and (5) = (4) / (3).

95% exact binomial confidence intervals are calculated.

Additional exclusion criteria (observations are not included in Data basis)

1. Patient was not referred to abroad
2. Patients “ude af system”/out of system are not included
3. If patients have two renal transplantations in a row (with no registered graft loss in between), only the second renal transplantation is taken into consideration
4. If patients have two registered graft losses in a row (with no registered renal transplantation in between), only the first graft loss is taken into consideration

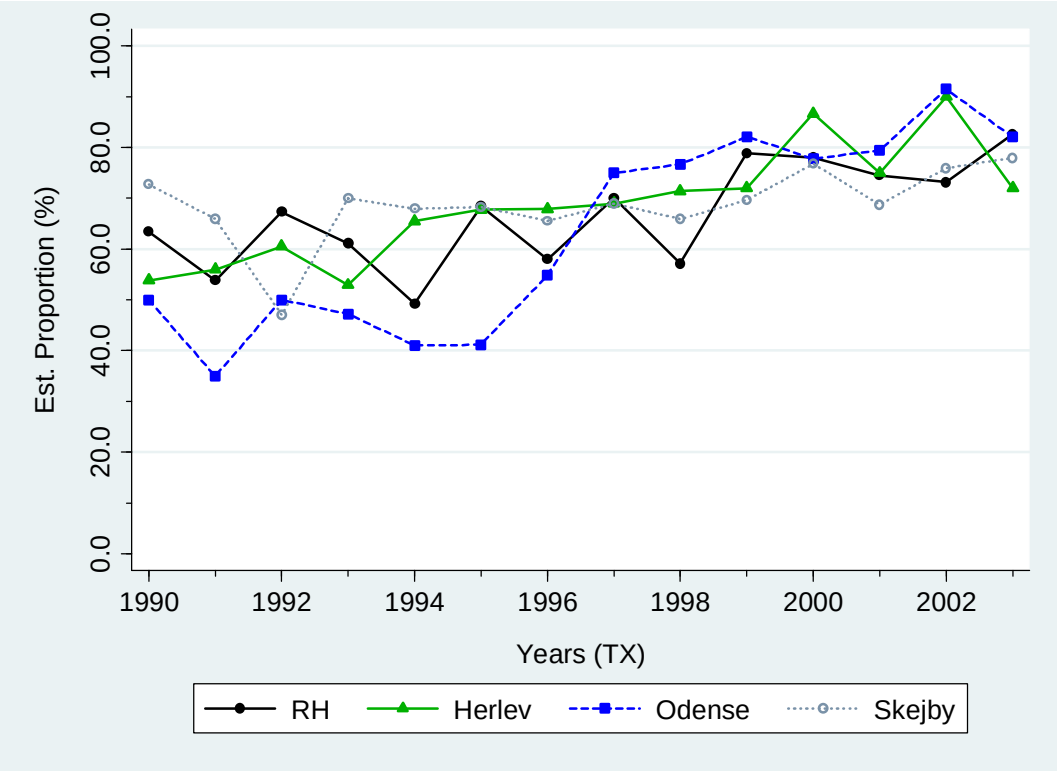
Fig. 22. 5-års graftoverlevelse / 5-year graft survival. Estimated proportions and 95% CI



Tabel 23: 5-års graftoverlevelse per center / 5-year graft survival by centre

Rigshospitalet (RH)*	**1990-94**	**1995-99**	**2000**	**2001**	**2002**	**2003**
Data basis	267	225	41	47	41	46
Meeting indicator criteria	157	151	32	35	30	38
Estimated proportion	58.8	67.1	78.0	74.5	73.2	82.6
Lower 95% CI	52.6	60.6	62.4	59.7	57.1	68.6
Upper 95% CI	64.8	73.2	89.4	86.1	85.8	92.2
Herlev	**1990-94**	**1995-99**	**2000**	**2001**	**2002**	**2003**
Data basis	152	134	15	20	20	25
Meeting indicator criteria	88	93	13	15	18	18
Estimated proportion	57.9	69.4	86.7	75.0	90.0	72.0
Lower 95% CI	49.6	60.9	59.5	50.9	68.3	50.6
Upper 95% CI	65.8	77.1	98.3	91.3	98.8	87.9
Odense	**1990-94**	**1995-99**	**2000**	**2001**	**2002**	**2003**
Data basis	171	159	27	34	47	39
Meeting indicator criteria	75	104	21	27	43	32
Estimated proportion	43.9	65.4	77.8	79.4	91.5	82.1
Lower 95% CI	36.3	57.5	57.7	62.1	79.6	66.5
Upper 95% CI	51.6	72.8	91.4	91.3	97.6	92.5
Skejby	**1990-94**	**1995-99**	**2000**	**2001**	**2002**	**2003**
Data basis	251	229	56	48	54	59
Meeting indicator criteria	158	154	43	33	41	46
Estimated proportion	62.9	67.5	76.8	68.8	75.9	78.0
Lower 95% CI	56.6	61.0	63.6	53.7	62.4	65.3
Upper 95% CI	68.9	73.6	87.0	81.3	86.5	87.7

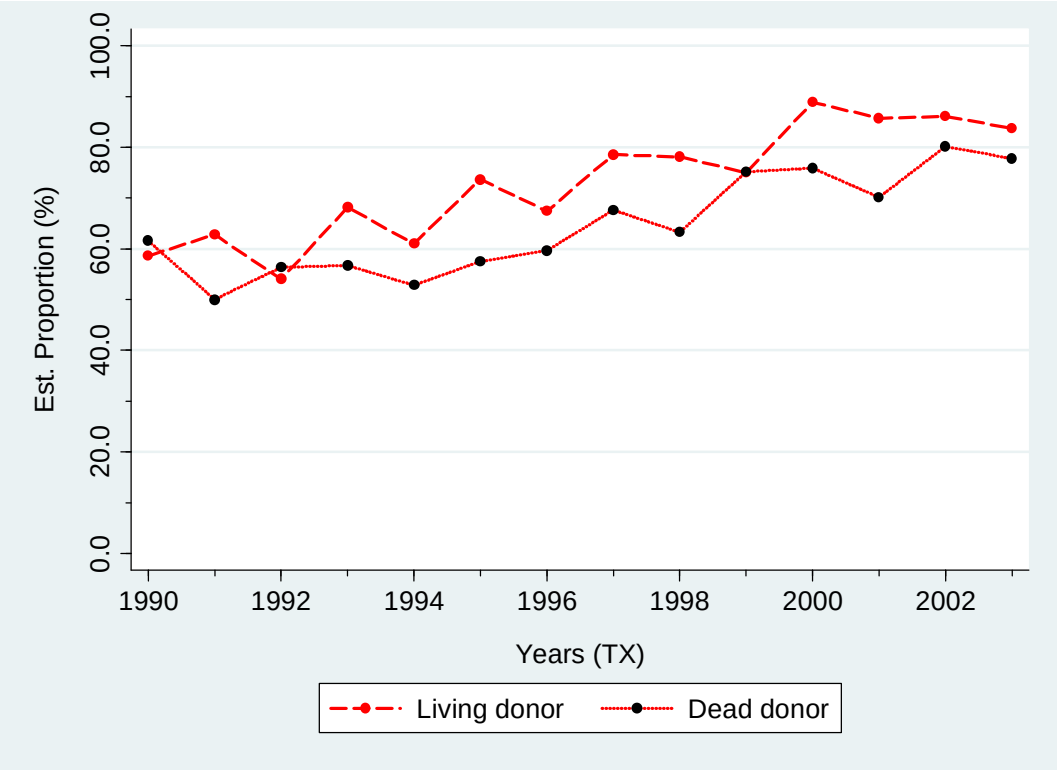
Fig. 23. 5-års graftoverlevelse per center / 5 year graft survival by centre



A binomial logistic model is fitted for the expected number of successes (that is, five-year graft survival) with *centre* and *years* as categorical covariates. In order to take into account that more than one transplantation per patient might have been included, a robust variance estimator is used. There is no significant difference between centres (*p*-value of overall Wald test: 0.2495). The (single) effects (odds ratios) of each centre against the others are estimated as follows:

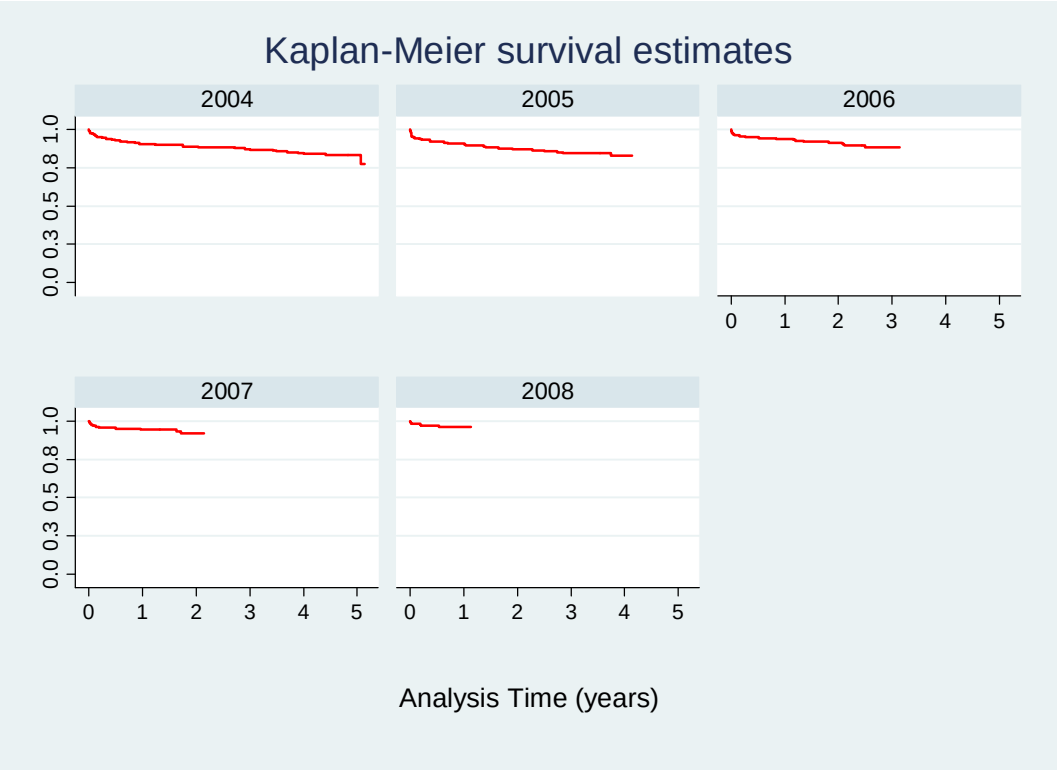
Centre	Est. effect (odds ratio)	95% CI	*P*-value
Herlev vs. Rigshospitalet RH	1.07	0.81 - 1.40	0.647
Odense vs. Rigshospitalet RH	0.84	0.64 - 1.08	0.166
Skejby vs. Rigshospitalet RH	1.06	0.83 - 1.34	0.655
Odense vs. Herlev	0.78	0.59 - 1.05	0.098
Skejby vs. Herlev	0.99	0.75 - 1.30	0.947
Skejby vs. Odense	1.26	0.98 - 1.62	0.070

Fig. 24: 5-års graftoverlevelse. Donor effect / 5-year graft survival. Donor effect.



A binomial logistic model is fitted for the expected number of successes (that is, five-year graft survival) with *donor relationship* and *years* as categorical covariates. In order to take into account that more than one transplantation per patient might have been included, a robust variance estimator is used. The effect (odds ratio) of donor relation, treating dead donor as default, is estimated as 1.49 (95% CI: 1.20 – 1.85). The resulting *p*-value of the corresponding Wald test is < 0.001.

Fig. 25: Overlevelse / Survival 2004-08



Year	N of TX	N of graft loss or death (until Feb 23, 2009)	Est. graft survival (%)	95% CI
2004	183	32	83.2 (at 5 yrs)	76.8 - 88.0
2005	162	26	82.8 (at 4.1 yrs)	75.2 – 88.2
2006	164	18	88.6 (at 3.1 yrs)	82.4 – 92.7
2007	162	11	92.1 (at 2.1 yrs)	86.1 – 95.7
2008	179	6	96.1 (at 1.1 yr)	91.4 – 98.3

No patients were transplanted more than once in each of the years 2004-08.

Tabel 24: Indikator 5a. Renal transplantation. 1-års patientoverlevelse / 1-year patient survival

Denmark	1990-94	1995-99	2000-04	2005	2006	2007
Data basis (1)	664	628	665	133	137	133
Data completeness (%) (2)	100.0	100.0	100.0	100.0	100.0	100.0
Actual data basis (3)	664	628	665	133	137	133
Meeting indicator criteria (4)	602	600	641	131	129	128
Estimated proportion (5)	90.7	95.5	96.4	98.5	94.2	96.2
Lower 95% CI	88.2	93.6	94.7	94.7	88.8	91.4
Upper 95% CI	92.8	97.0	97.7	99.8	97.4	98.8

Notes to table:

(1) Number of patients with first renal transplantation, in Denmark, after January 1, 1990

(2) Specific criteria for data completeness:

1. At least 1 year (365 days) follow-up time,
2. Negative time periods are not allowed,
3. Questions about type of donor kidney are answered

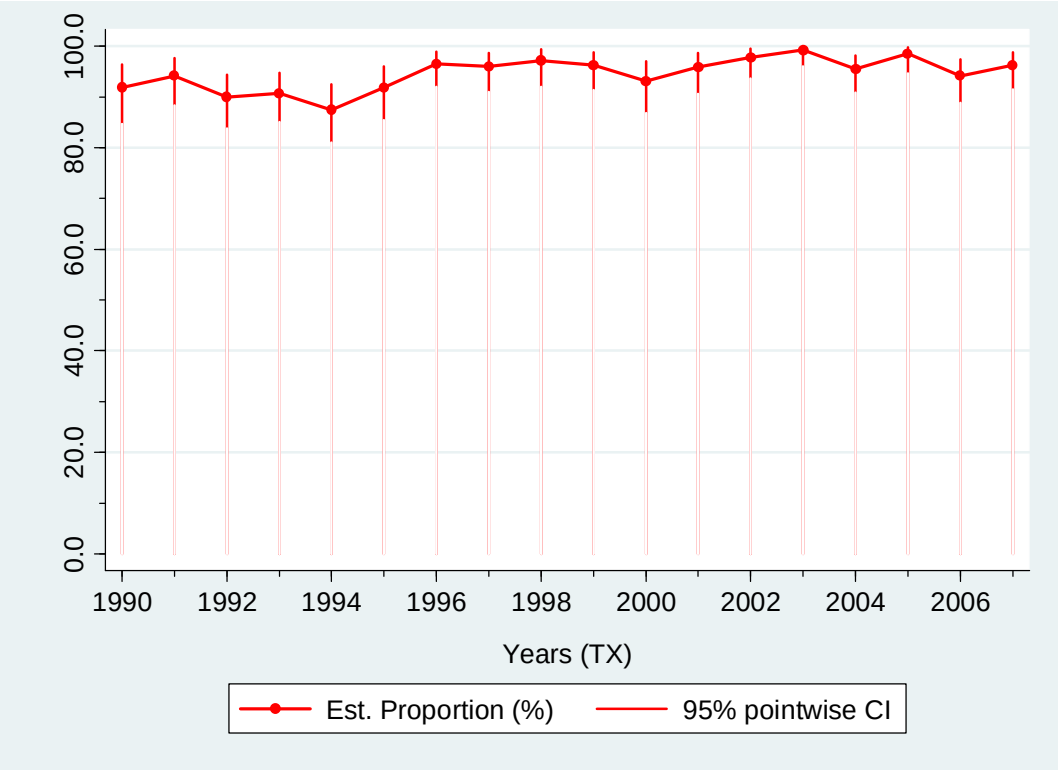
(3) Actual number of patients with first renal transplantation, in Denmark (and complete data)

(4) Number of patients in live more than 1 year

Note the following relations: (2) = (3) / (1) and (5) = (4) / (3).

95% exact binomial confidence intervals are calculated.

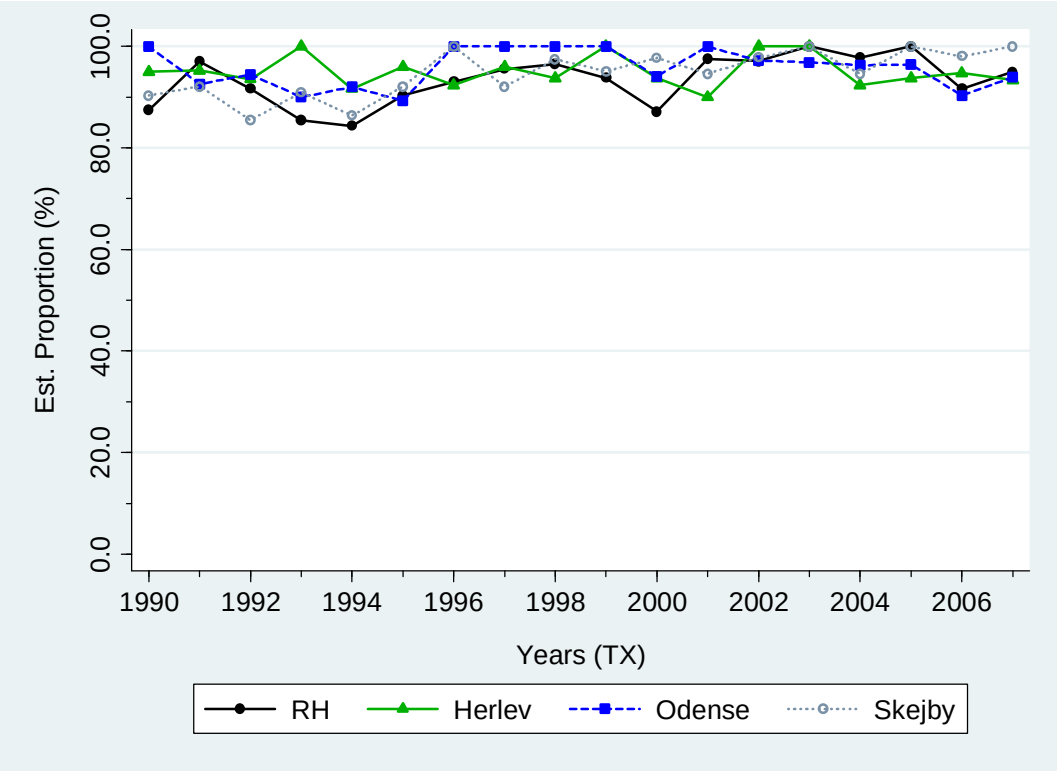
Fig. 26. 1-års patientoverlevelse / 1-year patient survival. Estimated proportions and 95% CI



Tabel 25: 1-år patientoverlevelse. Centereffekt / 1-year patient survival. Centre effect

Rigshospitalet (RH)	**1990-94**	**1995-99**	**2000-04**	**2005**	**2006**	**2007**
Data basis	208	196	201	49	36	40
Meeting indicator criteria	184	184	193	49	33	38
Estimated proportion	88.5	93.9	96.0	100	91.7	95.0
Lower 95% CI	83.3	89.5	92.3	92.7	77.5	83.1
Upper 95% CI	92.5	96.8	98.3	100	98.2	99.4
Herlev	**1990-94**	**1995-99**	**2000-04**	**2005**	**2006**	**2007**
Data basis	128	116	102	16	19	15
Meeting indicator criteria	122	111	97	15	18	14
Estimated proportion	95.3	95.7	95.1	93.8	94.7	93.3
Lower 95% CI	90.1	90.2	88.9	69.8	74	68.1
Upper 95% CI	98.3	98.6	98.4	99.8	99.9	99.8
Odense	**1990-94**	**1995-99**	**2000-04**	**2005**	**2006**	**2007**
Data basis	116	125	134	28	31	33
Meeting indicator criteria	108	122	130	27	28	31
Estimated proportion	93.1	97.6	97.0	96.4	90.3	93.9
Lower 95% CI	86.9	93.1	92.5	81.7	74.2	79.8
Upper 95% CI	97.0	99.5	99.2	99.9	98.0	99.3
Skejby	**1990-94**	**1995-99**	**2000-04**	**2005**	**2006**	**2007**
Data basis	212	191	228	40	51	45
Meeting indicator criteria	188	183	221	40	50	45
Estimated proportion	88.7	95.8	96.9	100.0	98.0	100.0
Lower 95% CI	83.6	91.9	93.8	91.2	89.6	92.1
Upper 95% CI	92.6	98.2	98.8	100.0	100.0	100.0

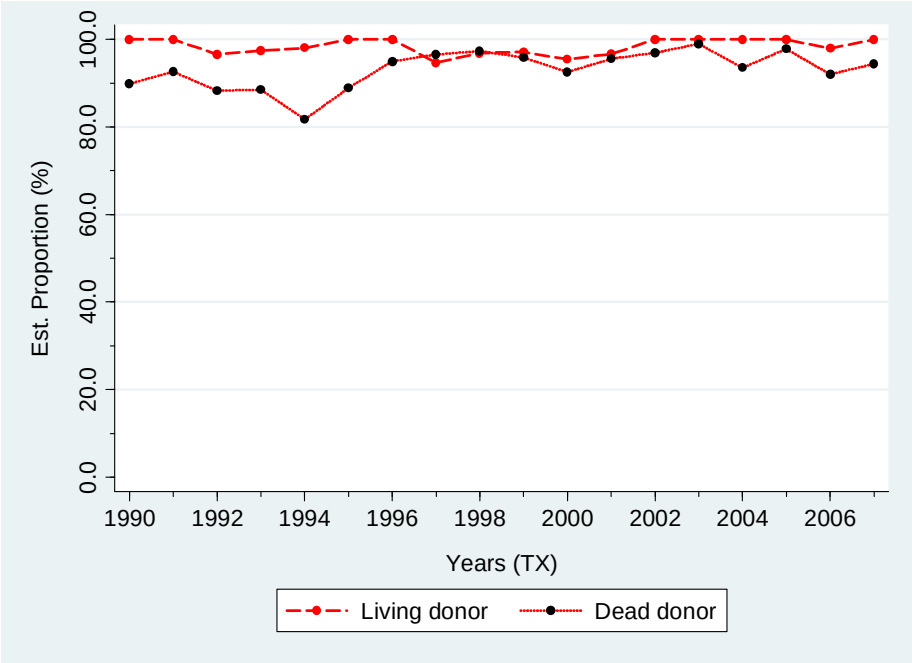
Fig. 27. 1-år patientoverlevelse. Center effect / 1-year patient survival. Centre effekt



A binomial logistic model is fitted for the expected number of successes (that is, one-year patient survival) with *centre* and *years* as categorical covariates. There is no significant difference between the centres (*p*-value of overall Wald test: 0.3316). The (single) effects (odds ratios) of each centre against the others are estimated as follows:

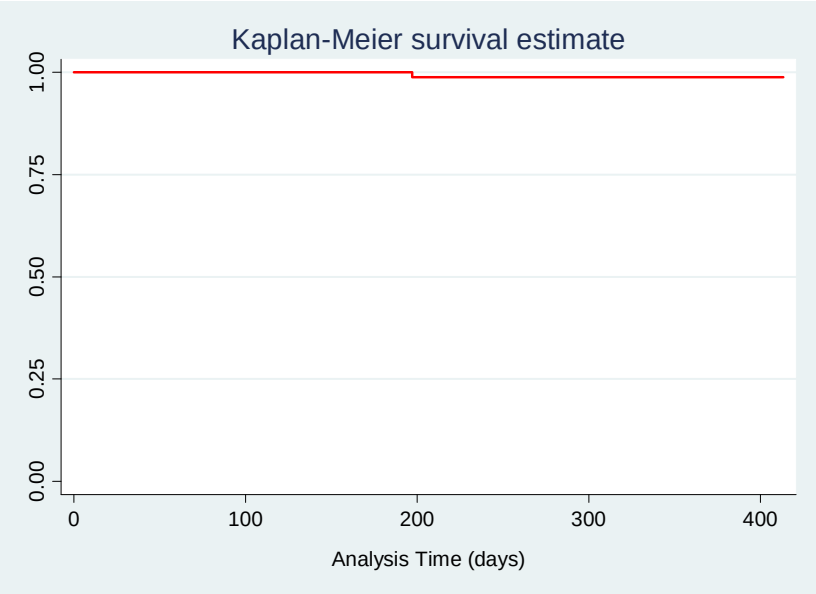
Centre	Est. effect (odds ratio)	95% CI	*P*-value
Herlev vs. Rigshospitalet RH	1.52	0.87 – 2.66	0.141
Odense vs. Rigshospitalet RH	1.45	0.86 – 2.45	0.165
Skejby vs. Rigshospitalet RH	1.31	0.85 – 2.03	0.219
Odense vs. Herlev	0.95	0.50 – 1.82	0.885
Skejby vs. Herlev	0.86	0.48 – 1.54	0.620
Skejby vs. Odense	0.91	0.53 – 1.56	0.722

Fig. 28: 1-år patientoverlevelse. Donor effect. / 1-year patient survival. Donor effect.



The effect (odds ratio) of donor relation, treating dead donor as default, is estimated as 4.86 (95% CI: 2.50 – 9.43). The resulting *p*-value of the corresponding Wald test is < 0.001.

Fig. 29: Patientoverlevelse / Patient Survival 2008



There was 1 death of a patient for 149 first-time transplantations in 2008 (until February 23, 2009). The one-year patient survival probability is estimated as 98.9% (95% CI: 92.1 – 99.8).

Tabel 26: Indikator 5b. Renal transplantation - 5-års patientoverlevelse / 5-year patient survival

Denmark	1990-94	1995-99	2000	2001	2002	2003
Data basis (1)	662	628	115	120	134	138
Data completeness (%) (2)	100.0	100.0	100.0	100.0	100.0	100.0
Actual data basis (3)	662	628	115	120	134	138
Meeting indicator criteria (4)	498	541	98	105	120	127
Estimated proportion (5)	75.2	86.1	85.2	87.5	89.6	92.0
Lower 95% CI	71.8	83.2	77.4	80.2	83.1	86.2
Upper 95% CI	78.5	88.8	91.1	92.8	94.2	96.0

Notes to table:

(1) Number of patients with first renal transplantation, in Denmark, after January 1, 1990

(2) Specific criteria for data completeness:

1. At least 5 years (1825 days) follow-up time,
2. Negative time periods are not allowed,
3. Questions about type of donor kidney are answered

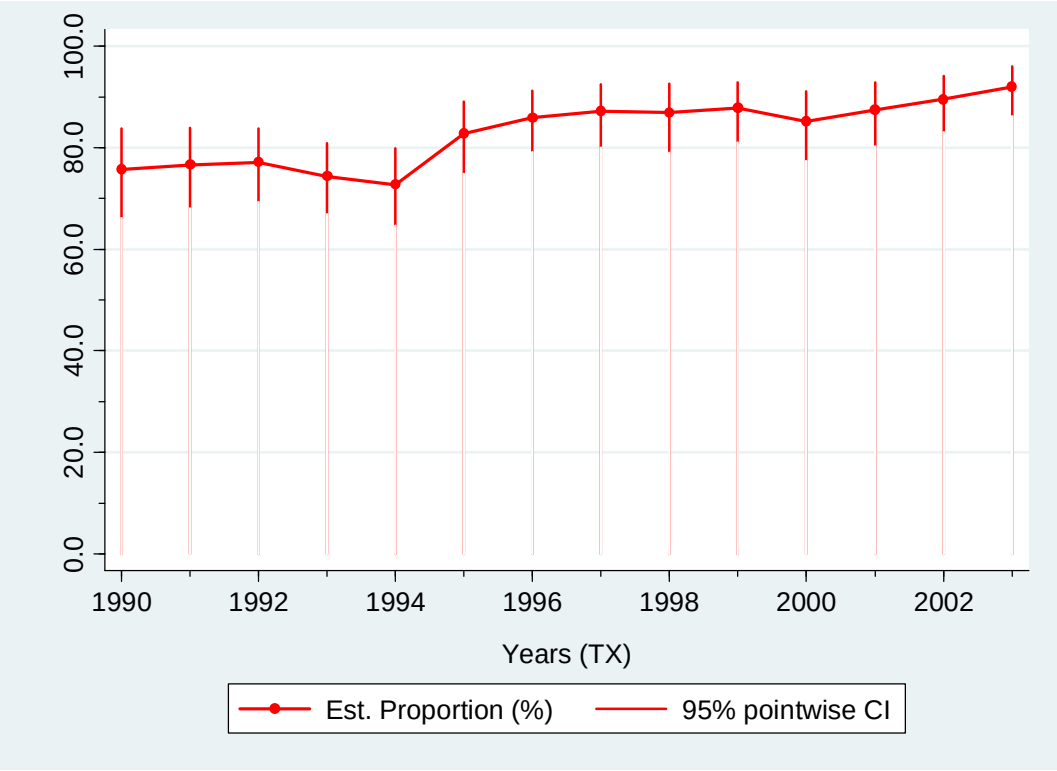
(3) Actual number of patients with first renal transplantation, in Denmark (and complete data)

(4) Number of patients in live more than 5 years

Note the following relations: (2) = (3) / (1) and (5) = (4) / (3).

95% exact binomial confidence intervals are calculated

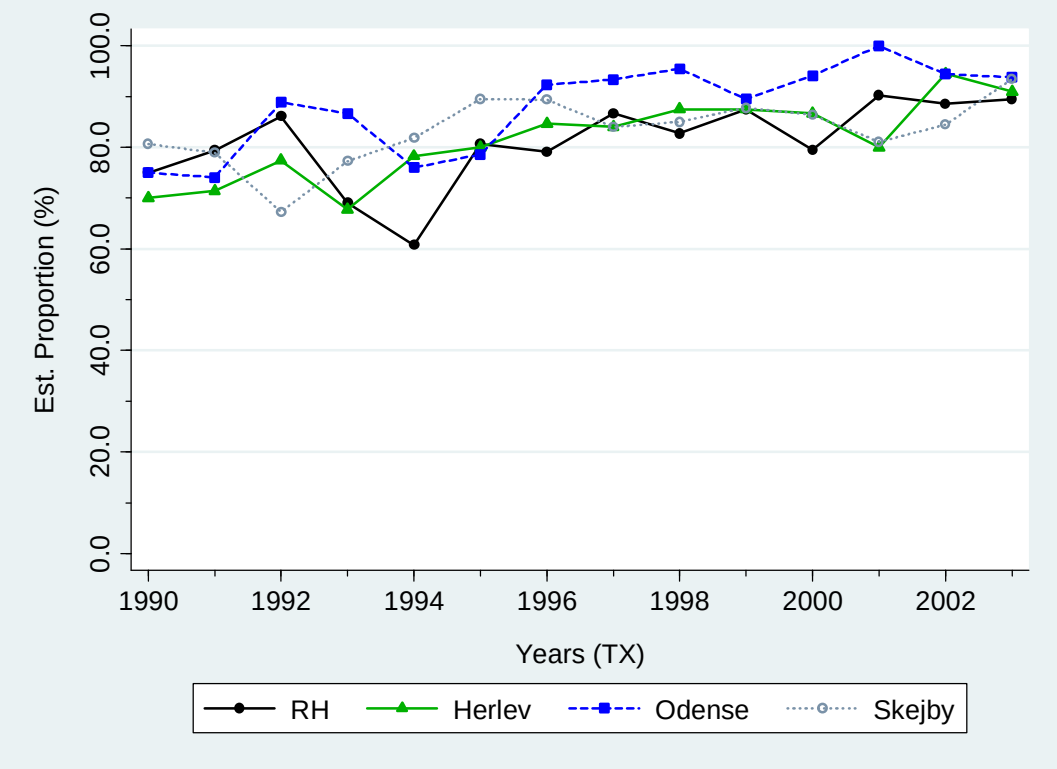
Fig. 30: 5-års patientoverlevelse / 5-year patient survival. Estimated proportions and 95% CI



Tabel 27: 5-års patientoverlevelse. Center effect. / 5-year patient survival. Centre effect.

Rigshospitalet (RH)*	**1990-94**	**1995-99**	**2000**	**2001**	**2002**	**2003**
Data basis	208	196	39	41	35	38
Data completeness (%)	100.0	100.0	100.0	100.0	100.0	100.0
Actual data basis	208	196	39	41	35	38
Meeting indicator criteria	151	164	31	37	31	34
Estimated proportion	72.6	83.7	79.5	90.2	88.6	89.5
Lower 95% CI	66.0	77.7	63.5	76.9	73.3	75.2
Upper 95% CI	78.5	88.6	90.7	97.3	96.8	97.1
Herlev	**1990-94**	**1995-99**	**2000**	**2001**	**2002**	**2003**
Data basis	126	116	15	20	18	22
Data completeness (%)	100.0	100.0	100.0	100.0	100.0	100.0
Actual data basis	126	116	15	20	18	22
Meeting indicator criteria	92	98	13	16	17	20
Estimated proportion	73.0	84.5	86.7	80.0	94.4	90.9
Lower 95% CI	64.4	76.6	59.5	56.3	72.7	70.8
Upper 95% CI	80.5	90.5	98.3	94.3	99.9	98.9
Odense	**1990-94**	**1995-99**	**2000**	**2001**	**2002**	**2003**
Data basis	116	125	17	22	36	32
Data completeness (%)	100.0	100.0	100.0	100.0	100.0	100.0
Actual data basis	116	125	17	22	36	32
Meeting indicator criteria	93	112	16	22	34	30
Estimated proportion	80.2	89.6	94.1	100.0	94.4	93.8
Lower 95% CI	71.7	82.9	71.3	84.6	81.3	79.2
Upper 95% CI	87.0	94.3	99.9	100.0	99.3	99.2
Skejby	**1990-94**	**1995-99**	**2000**	**2001**	**2002**	**2003**
Data basis	212	191	44	37	45	46
Data completeness (%)	100.0	100.0	100.0	100.0	100.0	100.0
Actual data basis	212	191	44	37	45	46
Meeting indicator criteria	162	167	38	30	38	43
Estimated proportion	76.4	87.4	86.4	81.1	84.4	93.5
Lower 95% CI	70.1	81.9	72.6	64.8	70.5	82.1
Upper 95% CI	82.0	91.8	94.8	92.0	93.5	98.6

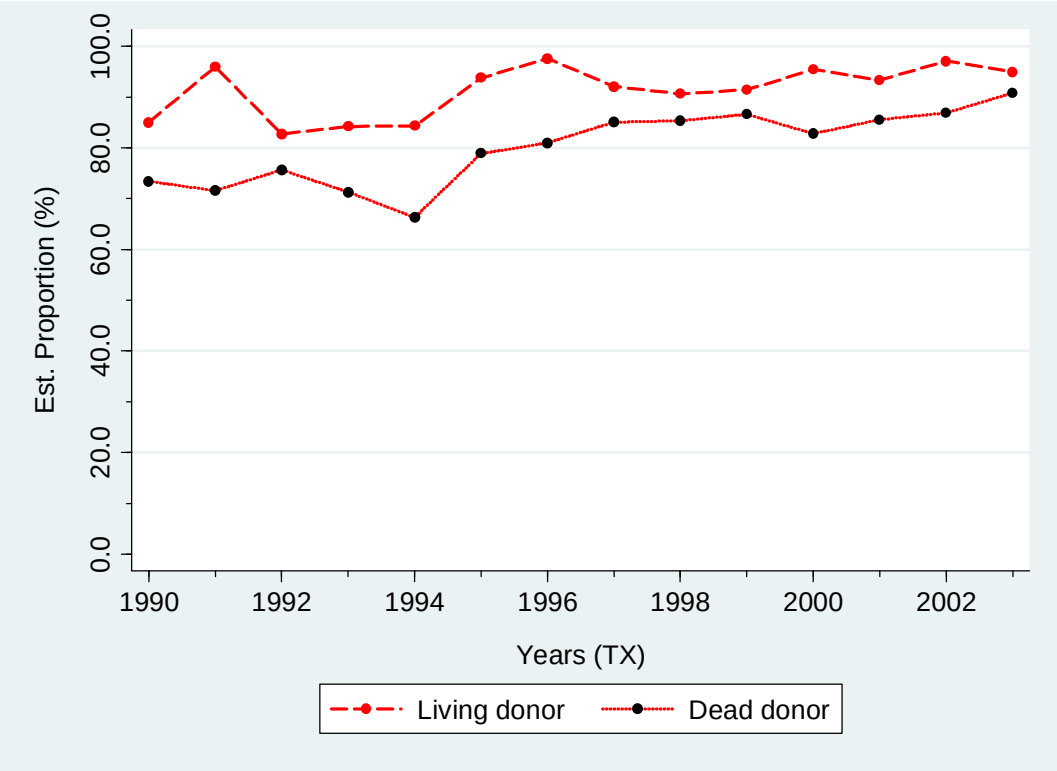
Fig. 31. 5-års patientoverlevelse. Center effect. / 5-year patient survival. Centre effect. Estimated proportions and 95% CI



A binomial logistic model is fitted for the expected number of successes (that is, five-year patient survival) with *centre* and *years* as categorical covariates. There is a significant difference between the centres over the 13 year period (*p*-value of overall Wald test: 0.0299). The (single) effects (odds ratios) of each centre against the others are estimated as follows:

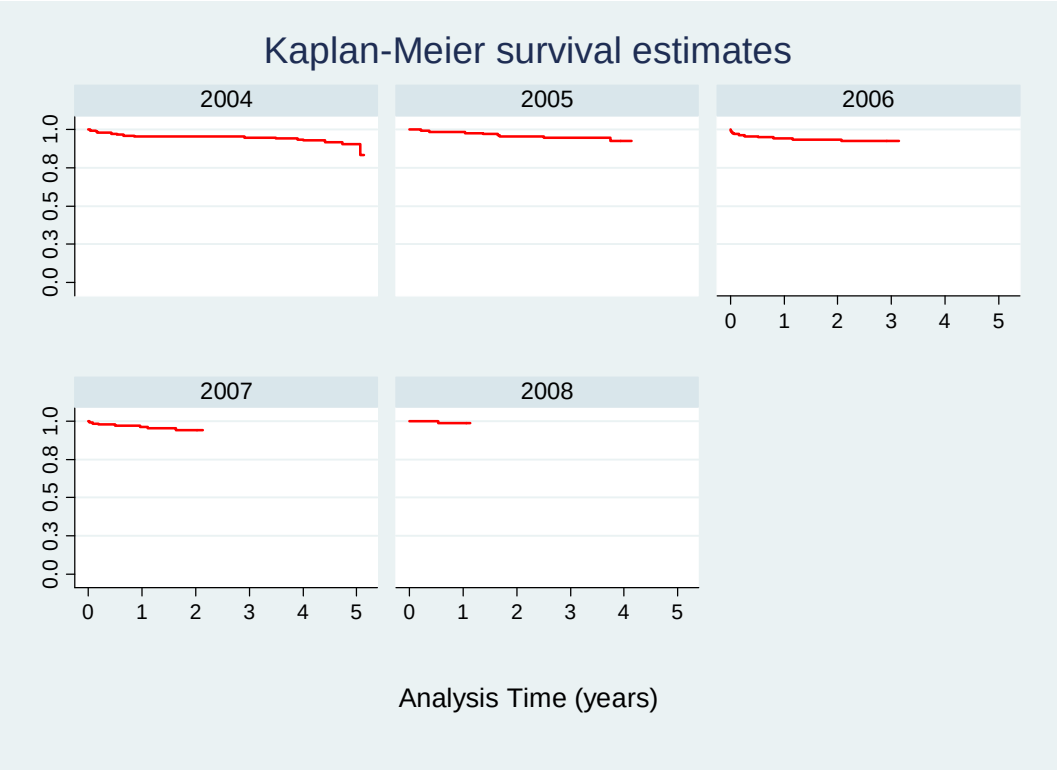
Centre	Est. effect (odds ratio)	95% CI	*P*-value
Herlev vs. Rigshospitalet RH	1.06	0.73 – 1.48	0.825
Odense vs. Rigshospitalet RH	1.77	1.20 – 2.62	0.004
Skejby vs. Rigshospitalet RH	1.19	0.87 – 1.62	0.268
Odense vs. Herlev	1.70	1.10 – 2.63	0.016
Skejby vs. Herlev	1.14	0.80 – 1.64	0.465
Skejby vs. Odense	0.67	0.45 – 1.00	0.049

Fig. 32: 5-års patientoverlevelse. Donor effect. / 5-year patient survival donor effect. Estimated proportions and 95% CI



A binomial logistic model is fitted for the expected number of successes (that is, five-year patient survival) with *donor relationship* and *years* as categorical covariates. The effect (odds ratio) of donor relation, treating dead donor as default, is estimated as 2.67 (95% CI: 1.93 – 3.71). The resulting *p*-value of the corresponding Wald test is < 0.001.

Fig. 33: Patientoverlevelse / Patient survival 2004-08



Year	N of first TX	N of death (until Feb 23, 2009)	Est. graft survival (%)	95% CI
2004	153	14	90.3 (at 5 yrs.)	83.5 – 94.4
2005	133	8	92.6 (at 4.1 yrs.)	84.7 – 96.6
2006	137	10	92.7 (at 3.1 yrs.)	86.9 – 96.0
2007	133	7	94.3 (at 2.1 yrs.)	88.2 – 97.3
2008	149	1	98.9 (at 1.1 yrs.)	92.1 – 99.8

DNSL Kommentarer til Danske Regioner Kvalitetsindikatorer

Indikator 1. Akut vs. Rutine Dialyseopstart

Dette er det første år hvor Indikator 1 & 2 publiceres. Indikator 1 er en lovende indikator for fremtiden, da akut opstart af dialyse er associeret med en, formentlig kausal, øget mortalitet. Tallene viser betydelige forskelle centrene imellem. Det samlede resultat vil kunne forbedres ved en målrettet og tidlig dialyseplanlægning, som påbegyndes ved en GFR på 15 ml/min. Dialyseopstart ved en GFR på 7-8 ml/min frem for den traditionelle 6 ml/min ville formentlig også forbedre det samlede resultat. Akut dialysestart er som oftest forårsaget af for sen henvisning (Indikator 2) og/eller for sen planlægning af dialyse efter henvisning. Akut opstart vil dog aldrig helt kunne undgås.

Indikator 2. Tidlig vs. Sen Henvisning

Akut dialyseopstart kan kun undgås hvis patienterne henvises i god tid, helst ved en GFR på 30 ml/min. Også her er der større forskelle centrene imellem. Forbedringer kræver ændringer i henvisningsmønstret fra andre afdelinger og almen praksis, d.v.s. øget information til omverdenen. Rutine beregning af eGFR for alle creatininmålinger foretaget af de biokemiske afdelinger, både indenfor og udenfor sygehusregi ville antageligvis medføre et øget henvisningsmønster. Der henvises i øvrigt til den netop publiceret rapport ”Metoder til vurdering af nyrefunktion og proteinuri” på foranledning af Dansk Selskab for Klinisk Biokemi og DNS (se www.nephrology.dk).

Indikator 3. Dialysemortalitet

De seneste 18 år har vist betydelige forbedringer i mortaliteten hos dialysepatienter (se side 26), med en ca. 50% forlænget medianoverlevelse. Dette kan til dels relateres til optimering af vores tidligere indikatorer: kontrol af hæmoglobin og dialysekvalitet (Kt/V). Fra dette og tidligere årsrapporter kan det ses at der næppe er mulighed for yderligere forbedring af disse to indikatorer. Muligheder for forbedring i fremtiden inkluderer optimering af calcium-phosphat-PTH kontrol (se ERA-EDTA kvalitetsindikatorer, side 60), forbedret hypertensionskontrol samt tidligere henvisning og dialyseforberedelse hos uræmiske patienter (se ovenfor). Den bedste måde at forbedre ESRD mortalitet i Danmark ville være at øge transplantationsaktivitet, idet en vellykket nyretransplantation kan forventes at halvere patientens risiko for at dø.

Indikator 4. Transplant Graftoverlevelse

Også for denne indicator er der sket betydelige forbedringer (se særrapporten Transplant Rejection 1990-2007), og de seneste resultater er fuld på højde med internationale værdier. Udover de velkendte forbedringer i akut grafttab (<1 år efter operationen) kan der for første gang i år publiceres forbedringer i det kroniske grafttab for danske patienter (>1 år efter operation). Årsagen hertil er ikke klarlagt; mulighederne inkluderer optimal blodtrykskontrol, og en reduktion i immunosuppression, specielt calcineurinhæmmere. Yderligere forbedringer kan forventes ved at fortsætte disse bestræbelser. Delayed graft funktion (DGF) er en hyppig komplikation til operationen, specielt nekronyretransplantation og er associeret, formentlig kausalt, med øget graft tab og mortalitet. Forbedret præ, per- og postoperativ pleje kan forventes at reducere DGF.
Årsresultatet viser signifikante forskelle imellem 5-års patientoverlevelse centrene imellem. Dette resultat skal fortokes med varsomhed. Forskellen er formentlig historisk (< år 2000). Der er betydelige forskelle i alderssammensætning (se Årsrapporten 2007). Et mere regelret billede ville dannes ved en analyse begrænset til årene efter 2000, og korrigeret for demografiske faktorer af betydning: alder, nyrediangosen og komorbiditet.

Indikator 5. Transplant Mortalitet

Forbedringer I mortalitet er også fremtrædende, og mortaliteten det første år er nede på et niveau med de efterfølgende år. Der er ingen forskel centrene imellem. Mulige tiltag er de samme som for graftoverlevelse.

ERA-EDTA Indicators

The following biochemical indicators are registered in ERA-EDTA as quality indicators: Haemoglobin, albumin, bicarbonate, C-reaktive protein, ionised calcium, creatinine, urea, total cholesterol, HDL cholesterol, LDL cholesterol, ferritin, iron, phosphate, PTH, transferrin, triglycerides, iron saturation. However, if an indicator is to function as a quality indicator, the following crieteria need to be fulfilled: (1) The variable must be subject to medical treatment; (2) Canges in the variable are assumed to alter prognosis. This is the case for the following variables: bicarbonate, ionised calcium, haemoglobin, phosphate, PTH. Creatinine as a measure of GFR is important, but the analysis is complicated by continuous changes in the population due to graft loss; cross-scetional studies will therefore give misleading results. A normal iron balance, as measured by ferritin and iron saturation is desirable for erythropoietin treatment. The treatment of of hypercholesterolemia in ESRD is at present controversial. National statistics for all variables are presented here, and center-specific data for all clinically documented quality markers.

All Centers

HD

	No.	Mean	SD	25%	Median	75%
Albumin (g/l)*	1784	38,7	5,0	36	39	42
Bicarbonate (mM)	1160	23,5	3,4	21,0	23,0	25,6
C-reaktive Protein (mg/l)	1324	26,8	78,1	3	8	23
Ionised Calcium (mM)	1662	1,19	0,10	1,13	1,19	1,25
Urea (mM)	1598	19,6	6,9	15,0	19,4	23,8
Creatinine (µM)	1540	653	244	480	642	807
Total cholesterol (mM)	1051	4,14	1,17	3,30	4,00	4,80
HDL Cholesterol (mM)	890	1,21	0,44	0,90	1,15	1,40
LDL Cholesterol (mM)	864	2,13	0,93	1,4	2,0	2,7
Ferritin (mg/l)	1057	520	548	197	410	656
Haemoglobin (mM)	1601	7,25	0,86	6,7	7,3	7,8
Iron (mM)	969	10,5	5,6	7	9	13
Phosphate (mM)	1610	1,58	0,50	1,25	1,52	1,84
PTH (pM)**	1514	29,4	31,5	11,3	20,8	36,9
Transferrin (mM)	1137	21,5	5,0	18	21	24
Triglycerides (mM)	770	1,82	1,51	1,00	1,46	2,20
Iron Saturation	811	0,24	0,13	0,16	0,21	0,29

PD

	No.	Mean	SD	25%	Median	75%
Albumin (g/l)*	605	36,5	5,1	33,8	37	40
Bicarbonate (mM)	446	25,3	3,6	23	25	27
C-reaktive Protein (mg/l)	477	22,4	46,7	2	6	20
Ionised Calcium (mM)	574	1,21	0,09	1,16	1,21	1,26
Urea (mM)	572	19,2	7,4	15,1	18,7	22,
Creatinine (µM)	559	702	273	513	689	870
Total cholesterol (mM)	374	4,86	1,41	3,90	4,75	5,60
HDL Cholesterol (mM)	288	1,30	0,49	1,0	1,2	1,5
LDL Cholesterol (mM)	232	2,72	1,21	1,9	2,6	3,3
Ferritin (mg/l)	443	436	537	123	281	520
Haemoglobin (mM)	533	7,40	0,90	6,9	7,4	8,0
Iron (mM)	370	12,4	5,4	8	12	16
Phosphate (mM)	572	1,61	0,42	1,32	1,56	1,83
PTH (pM)**	549	28,0	25,1	11,6	22,1	35,7
Transferrin (mM)	399	24,1	5,3	21,0	24,6	28,0
Triglycerides (mM)	197	2,00	1,24	1,19	1,70	2,43
Iron Saturation	293	0,26	0,12	0,18	0,24	0,32

Transplant

Albumin (g/l)*	1493	42,5	4,1	40,4	43,0	45,2
Bicarbonate (mM)	1191	24,2	3,6	22	24	26,7
C-reaktive Protein (mg/l)	994	11,4	30,4	1	3	8
Ionised Calcium (mM)	1532	1,26	0,08	1,22	1,26	1,31
Urea (mM)	1492	13,0	8,4	7,6	10,7	15,8
Creatinine (µM)	1554	160	101	106	135	184
Total cholesterol (mM)	924	5,44	1,29	4,60	5,30	6,20
HDL Cholesterol (mM)	752	1,41	0,50	1,10	1,30	1,70
LDL Cholesterol (mM)	702	3,11	1,25	2,40	3,00	3,70
Ferritin (mg/l)	372	334	434	86	199	406
Haemoglobin (mM)	1542	7,97	1,10	7,20	8,00	8,70
Iron (mM)	308	13,2	6,2	9	13	17
Phosphate (mM)	1521	1,05	0,32	0,86	1,01	1,20
PTH (pM)**	833	16,3	17,1	6,5	11,2	19,8
Transferrin (mM)	249	27,0	6,2	23	27	30
Triglycerides (mM)	703	2,26	1,52	1,30	1,87	2,71
Iron Saturation	231	0,25	0,13	0,16	0,24	0,33

*: For µmol/l multiply by 15,2. **: for ng/l multiply by 9,5.

B-Haemoglobin (mM)

HD

	No.	Mean	SD	25%	Median	75%	%>6,5
Danmark	1601	7,25	0,86	6,7	7,3	7,8	83
Rigshospitalet	224	7,14	1,00	6,4	7,2	7,8	74
Herlev	82	7,13	0,91	6,6	7,2	7,8	77
Hillerød	191	7,19	0,83	6,6	7,1	7,7	83
Roskilde	61	7,42	0,85	6,9	7,5	8,0	87
Holbæk	117	7,15	0,87	6,8	7,2	7,6	79
Nykøbing F	90	7,14	0,83	6,6	7,1	7,7	77
Rønne	23	7,63	0,79	7,2	7,6	8,3	91
Odense	192	7,23	0,77	6,8	7,2	7,7	87
Sønderborg	101	7,53	0,86	6,9	7,5	8,2	89
Esbjerg	9	6,89	1,15	6,5	6,9	7,3	78
Fredericia	109	7,21	0,76	6,6	7,2	7,7	84
Holstebro	93	7,65	0,71	7,2	7,6	8,1	97
Skejby	234	7,29	0,79	6,7	7,3	7,8	85
Viborg	75	7,03	0,83	6,5	7,0	7,5	76

PD

Danmark	533	7,40	0,90	6,9	7,4	8,0	88
Rigshospitalet	72	7,19	1,00	6,6	7,0	7,9	82
Herlev	33	7,28	0,97	6,8	7,1	7,8	85
Hillerød	33	7,59	0,76	7,2	7,5	8,0	94
Roskilde	52	7,23	0,75	6,7	7,3	7,7	83
Holbæk	41	7,29	1,08	6,5	7,3	7,9	76
Nykøbing F	17	7,17	0,57	6,7	7,3	7,5	94
Rønne	1	6,40	0,00	6,4	6,4	6,4	0
Odense	39	7,05	0,81	6,5	7,0	7,6	77
Sønderborg	43	7,64	1,00	6,9	7,5	8,2	93
Esbjerg	6	7,27	0,48	7,2	7,3	7,4	100
Fredericia	50	7,44	0,80	6,9	7,4	8,0	92
Holstebro	20	8,10	0,83	7,5	8,2	8,7	100
Skejby	90	7,61	0,82	7,0	7,6	8,2	94
Viborg	36	7,44	0,89	6,8	7,4	7,9	92

Transplant

Danmark	1542	7,97	1,10	7,20	8,00	8,70	92
Rigshospitalet	485	8,03	1,05	7,3	8,0	8,7	94
Herlev	223	8,04	1,13	7,2	8,1	8,8	95
Roskilde	11	7,19	0,91	6,2	7,1	8,3	73
Holbæk	25	8,23	0,94	7,6	8,3	8,9	96
Odense	226	7,59	1,20	6,7	7,6	8,4	82
Sønderborg	7	7,76	1,06	6,4	8,1	8,6	71
Esbjerg	2	6,55	1,34	5,6	6,6	7,5	50
Fredericia	43	7,79	1,04	6,9	7,9	8,5	95
Holstebro	104	8,05	1,06	7,3	8,1	8,9	94
Skejby	319	8,07	1,09	7,3	8,1	8,8	92
Viborg	97	8,10	1,03	7,5	8,1	8,8	97

Iron Saturation

HD

	No.	Mean	SD	25%	Median	75%	%>0,20
Danmark	811	0,24	0,13	0,16	0,21	0,29	57
Rigshospitalet	175	0,25	0,13	0,17	0,22	0,30	61
Herlev	80	0,23	0,13	0,13	0,20	0,30	51
Hillerød	186	0,23	0,11	0,16	0,20	0,26	52
Roskilde	56	0,21	0,12	0,15	0,19	0,26	46
Nykøbing F	93	0,23	0,09	0,17	0,21	0,26	56
Rønne	23	0,26	0,12	0,21	0,25	0,28	78
Odense	19	0,27	0,16	0,17	0,22	0,29	63
Esbjerg	10	0,27	0,17	0,14	0,23	0,28	70
Fredericia	4	0,36	0,07	0,31	0,34	0,42	100
Holstebro	93	0,27	0,16	0,15	0,24	0,32	60
Skejby	66	0,25	0,12	0,17	0,21	0,31	58
Viborg	6	0,31	0,06	0,30	0,31	0,33	100

PD

Danmark	293	0,26	0,12	0,18	0,24	0,32	70
Rigshospitalet	63	0,24	0,09	0,18	0,23	0,31	67
Herlev	30	0,28	0,16	0,17	0,23	0,32	73
Hillerød	33	0,26	0,11	0,19	0,25	0,30	70
Roskilde	48	0,24	0,16	0,16	0,22	0,29	60
Nykøbing F	13	0,23	0,08	0,17	0,23	0,30	62
Rønne	1	0,23	0,00	0,23	0,23	0,23	100
Odense	4	0,34	0,10	0,27	0,37	0,40	75
Esbjerg	41	0,28	0,10	0,22	0,27	0,33	85
Fredericia	31	0,32	0,12	0,24	0,30	0,39	87
Holstebro	20	0,22	0,12	0,15	0,20	0,24	55
Skejby	8	0,26	0,11	0,18	0,22	0,29	63
Viborg	1	0,17	0,00	0,17	0,17	0,17	0

Ferrritin (mg/l)

HD

	No.	Mean	SD	25%	Median	75%	%>200
Danmark	1057	520	548	197	410	656	74
Rigshospitalet	174	687	656	280	552	817	86
Herlev	82	242	220	70	170	353	48
Hillerød	185	330	417	78	186	379	61
Roskilde	56	465	357	220	428	566	84
Holbæk	9	799	565	286	812	890	89
Nykøbing F	93	434	353	270	370	530	82
Rønne	23	454	191	287	432	559	91
Odense	158	490	229	347	463	602	88
Sønderborg	101	641	355	371	583	813	93
Esbjerg	12	428	253	250	377	591	92
Fredericia	108	535	379	248	471	767	77
Holstebro	94	390	260	171	367	576	71
Skejby	217	511	374	289	489	631	90
Viborg	78	582	448	344	493	686	94

PD

	No.	Mean	SD	25%	Median	75%	%>200
Danmark	443	436	537	123	281	520	62
Rigshospitalet	63	433	274	243	357	617	79
Herlev	30	398	365	159	269	543	63
Hillerød	33	379	395	98	311	513	65
Roskilde	48	240	183	85	205	344	50
Holbæk	13	633	712	173	240	942	62
Nykøbing F	13	335	130	200	340	470	69
Odense	44	355	226	199	311	438	63
Sønderborg	44	236	160	126	185	326	44
Esbjerg	41	408	270	162	361	598	73
Fredericia	51	624	415	329	548	863	90
Holstebro	21	170	169	48	116	231	33
Skejby	82	302	214	149	254	432	59
Viborg	35	404	337	208	377	470	80

Ionised Calcium (mM)

HD	No.	Mean	SD	25%	Median	75%	Distribution (%)			
							<1,15	**1,15-1,25**	**1,25-1,35**	**>1,35**
Danmark	1662	1,19	0,10	1,13	1,19	1,25	37	41	18	5
Rigshospitalet	218	1,20	0,10	1,14	1,18	1,25	35	41	18	6
Herlev	82	1,20	0,09	1,13	1,20	1,26	31	41	21	6
Hillerød	190	1,16	0,08	1,11	1,16	1,22	47	44	8	1
Roskilde	108	1,12	0,13	1,03	1,08	1,19	68	17	11	5
Holbæk	117	1,20	0,13	1,12	1,18	1,27	35	38	13	14
Nykøbing F	90	1,21	0,09	1,14	1,20	1,27	34	31	25	9
Rønne	23	1,27	0,07	1,19	1,27	1,33	0	43	39	17
Odense	191	1,18	0,08	1,13	1,18	1,23	38	49	11	2
Sønderborg	101	1,21	0,10	1,15	1,21	1,27	26	43	24	7
Esbjerg	32	1,21	0,10	1,14	1,21	1,30	28	31	37	3
Fredericia	109	1,17	0,10	1,12	1,17	1,22	45	44	10	1
Holstebro	94	1,20	0,13	1,15	1,22	1,26	27	45	21	7
Skejby	232	1,20	0,10	1,15	1,20	1,26	28	44	23	5
Viborg	75	1,20	0,10	1,14	1,22	1,27	33	36	25	5

PD

Danmark	574	1,21	0,09	1,16	1,21	1,26	25	46	23	6
Rigshospitalet	71	1,23	0,11	1,16	1,22	1,30	24	39	21	15
Herlev	33	1,23	0,11	1,16	1,24	1,28	24	36	27	12
Hillerød	33	1,20	0,10	1,13	1,20	1,28	33	36	24	6
Roskilde	54	1,22	0,10	1,18	1,23	1,29	20	46	24	9
Holbæk	42	1,21	0,08	1,17	1,21	1,24	17	61	14	7
Nykøbing F	16	1,23	0,06	1,19	1,23	1,27	19	43	38	0
Rønne	1	1,29	0,00	1,29	1,29	1,29				
Odense	40	1,19	0,08	1,13	1,19	1,25	38	43	18	3
Sønderborg	44	1,23	0,08	1,17	1,23	1,27	18	44	30	7
Esbjerg	40	1,22	0,05	1,17	1,22	1,26	10	60	30	0
Fredericia	54	1,22	0,07	1,17	1,22	1,28	19	46	35	0
Holstebro	20	1,20	0,10	1,14	1,19	1,26	25	50	15	10
Skejby	90	1,19	0,07	1,14	1,19	1,24	33	49	17	1
Viborg	36	1,19	0,10	1,13	1,18	1,25	36	42	19	3

Transplant

Danmark	1532	1,26	0,08			
Rigshospitalet	480	1,28	0,08	1,24	1,28	1,32
Herlev	222	1,26	0,08	1,22	1,26	1,31
Roskilde	11	1,20	0,10	1,06	1,21	1,27
Holbæk	24	1,25	0,05	1,21	1,27	1,29
Odense	225	1,24	0,09	1,20	1,25	1,29
Sønderborg	6	1,32	0,11	1,24	1,27	1,39
Esbjerg	10	1,27	0,08	1,21	1,24	1,31
Fredericia	58	1,25	0,07	1,20	1,25	1,30
Holstebro	98	1,24	0,07	1,21	1,24	1,28
Skejby	316	1,27	0,08	1,22	1,26	1,31
Viborg	81	1,26	0,09	1,23	1,25	1,30

Phosphate (mM)

	No.	Mean	SD	25%	Median	75%	%>1,8
HD							
Danmark	1610	1,58	0,50	1,25	1,52	1,84	28
Rigshospitalet	214	1,50	0,56	1,11	1,40	1,86	29
Herlev	82	1,68	0,43	1,34	1,67	2,01	39
Hillerød	190	1,52	0,42	1,27	1,48	1,70	17
Roskilde	61	1,86	0,60	1,50	1,80	2,20	49
Holbæk	117	1,69	0,49	1,36	1,68	1,97	39
Nykøbing F	90	1,48	0,53	1,15	1,38	1,67	19
Rønne	23	1,59	0,41	1,37	1,53	1,77	17
Odense	192	1,55	0,45	1,25	1,49	1,77	22
Sønderborg	100	1,66	0,44	1,36	1,58	1,96	32
Esbjerg	30	1,39	0,33	1,18	1,41	1,59	7
Fredericia	109	1,59	0,45	1,28	1,54	1,87	30
Holstebro	94	1,42	0,46	1,13	1,39	1,72	18
Skejby	233	1,65	0,55	1,33	1,60	1,90	32
Viborg	75	1,62	0,46	1,38	1,55	1,84	25
PD							
Danmark	572	1,61	0,42	1,32	1,56	1,83	27
Rigshospitalet	72	1,66	0,50	1,29	1,67	2,00	32
Herlev	33	1,68	0,51	1,29	1,63	1,85	36
Hillerød	33	1,80	0,50	1,52	1,70	2,05	42
Roskilde	52	1,68	0,48	1,30	1,70	2,05	38
Holbæk	42	1,54	0,44	1,28	1,51	1,77	24
Nykøbing F	17	1,54	0,24	1,42	1,51	1,60	18
Rønne	1	1,92	0,00	1,92	1,92	1,92	100
Odense	39	1,63	0,40	1,40	1,54	1,81	28
Sønderborg	44	1,56	0,37	1,26	1,50	1,87	27
Esbjerg	40	1,50	0,33	1,27	1,52	1,71	13
Fredericia	53	1,52	0,39	1,32	1,52	1,75	15
Holstebro	20	1,52	0,30	1,31	1,55	1,64	20
Skejby	90	1,59	0,32	1,36	1,54	1,82	27
Viborg	36	1,66	0,44	1,33	1,64	1,82	28
Transplant							
Danmark	1521	1,05	0,32	0,86	1,01	1,20	2
Rigshospitalet	481	1,05	0,33	0,84	1,02	1,18	3
Herlev	223	1,07	0,28	0,89	1,06	1,22	1
Roskilde	11	1,09	0,28	0,90	1,00	1,30	0
Holbæk	23	1,14	0,27	0,97	1,06	1,21	4
Odense	213	1,01	0,36	0,78	0,97	1,17	4
Sønderborg	6	1,09	0,17	1,00	1,17	1,20	0
Esbjerg	10	1,16	0,54	0,87	1,05	1,27	10
Fredericia	58	0,99	0,25	0,83	0,94	1,09	0
Holstebro	103	1,07	0,32	0,90	1,00	1,16	3
Skejby	316	1,08	0,30	0,90	1,05	1,23	1
Viborg	76	0,98	0,28	0,81	0,94	1,15	0

*Parathyroid Hormone (PTH) (pM)**

	No.	Mean	SD	25%	Median	75%	%>31,5
HD							
Danmark	1514	29,4	31,5	11,3	20,8	36,9	30
Rigshospitalet	172	34,1	38,0	11,2	23,2	46,4	40
Herlev	80	43,5	45,4	15,6	27,1	55,9	45
Hillerød	185	33,8	40,1	15,0	21,6	35,1	32
Roskilde	60	32,6	30,2	17,4	23,3	34,0	28
Holbæk	113	30,5	29,0	10,4	21,4	39,8	36
Nykøbing F	91	19,3	13,9	8,5	15,8	27,3	16
Rønne	23	27,5	22,3	14,5	20,7	30,7	22
Odense	194	29,8	30,8	9,6	21,0	39,3	32
Sønderborg	97	24,7	20,0	11,5	20,1	28,7	23
Esbjerg	5	43,1	55,7	8,6	22,9	41,8	40
Fredericia	109	27,3	17,8	14,0	24,0	37,0	30
Holstebro	94	20,4	18,4	6,7	14,9	27,0	22
Skejby	215	27,5	33,3	10,4	18,9	34,5	27
Viborg	76	25,3	20,7	11,8	20,8	32,0	26
PD							
Danmark	549	28,0	25,1	11,6	22,1	35,7	32
Rigshospitalet	68	31,9	35,8	10,6	22,2	37,6	35
Herlev	31	28,4	21,4	16,6	21,8	31,9	26
Hillerød	33	45,4	44,0	19,2	32,3	58,8	52
Roskilde	49	38,3	27,4	18,4	29,8	51,5	47
Holbæk	41	23,4	17,3	11,2	19,9	27,4	20
Nykøbing F	19	26,2	26,3	8,5	13,5	40,2	26
Rønne	1	26,2	0,0	26,2	26,2	26,2	0
Odense	36	25,4	28,4	8,9	14,0	37,5	31
Sønderborg	44	18,9	15,3	8,1	15,3	24,2	18
Esbjerg	39	29,1	18,5	13,0	23,6	37,3	38
Fredericia	50	26,5	19,2	13,0	24,5	33,0	30
Holstebro	20	26,5	13,1	16,1	24,6	35,3	40
Skejby	84	20,8	14,8	9,1	17,5	28,8	21
Viborg	34	28,2	15,4	13,6	26,8	38,7	41
Transplant							
Danmark	833	16,3	17,1	6,5	11,2	19,8	11
Rigshospitalet	379	15,3	16,4	6,1	10,3	18,7	9
Herlev	151	15,2	13,5	6,7	11,7	19,5	9
Holbæk	9	15,3	9,4	9,5	12,1	22,8	0
Odense	69	18,7	24,5	5,2	11,0	23,0	20
Sønderborg	3	14,7	6,7	10,3	11,4	22,4	0
Esbjerg	4	30,5	30,5	10,3	19,8	50,8	25
Fredericia	10	23,0	20,3	7,1	19,0	30,0	10
Holstebro	79	16,4	15,6	6,8	11,7	20,2	11
Skejby	82	19,7	21,0	7,0	12,3	24,3	16
Viborg	46	16,2	14,4	8,0	13,2	20,6	9

*For ng/l , multiply by 9,5.

Peritonitis Number 2007-8

	2007				2008			
	Patient years	Number	No./yr	Months/ Episode	Patient years	Number	No./yr	Months/ Episode
Danmark	**678,2**	**287**	**0,42**	**28,4**	**691,6**	**234**	**0,34**	**35,5**
Rigshospitalet	67,1	18	0,27	44,7	68,4	20	0,29	41,0
Herlev	57,0	43	0,75	15,9	57,3	38	0,66	18,1
Hillerød	46,8	13	0,28	43,2	40,0	1	0,02	480,2
Roskilde	42,9	22	0,51	23,4	50,3	23	0,46	26,3
Holbæk	36,2	22	0,61	19,7	44,1	14	0,32	37,8
Nykøbing F	21,1	2	0,09	126,4	23,3	8	0,34	34,9
Odense	52,4	33	0,63	19,0	48,9	23	0,47	25,5
Sønderborg	50,8	34	0,67	17,9	45,6	15	0,33	36,5
Esbjerg	36,7	28	0,76	15,7	34,2	12	0,35	34,2
Fredericia	66,1	21	0,32	37,7	60,3	16	0,27	45,2
Holstebro	26,1	1	0,04	312,9	25,9	10	0,39	31,1
Skejby	88,2	31	0,35	34,1	96,0	29	0,30	39,7
Viborg	33,4	11	0,33	36,4	36,6	17	0,46	25,8

The epidemiology of actively treated uraemia in Denmark:

An overview for the period 1990-2008, with projections

Professor Anders Green, for the The Danish National Registry Report on Dialyses and Transplantation in Denmark 2008.

The Danish Society of Nephrology on collaboration with Center for National Clinical Databases, South

Table 1. Overview of data

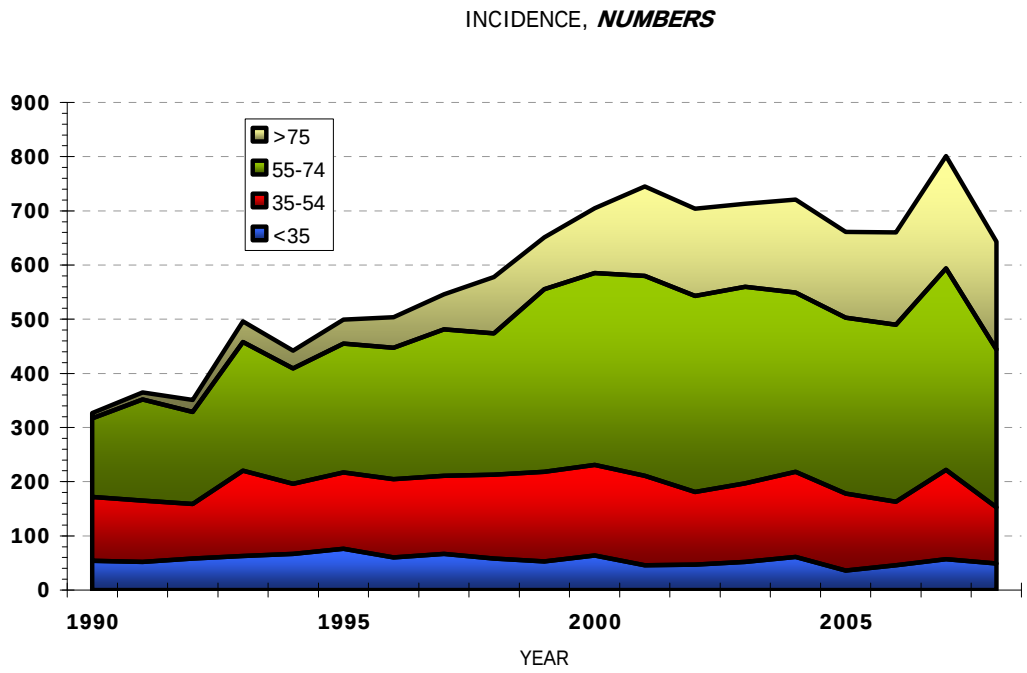
SUMMARY ANALYSIS: OVERVIEW OF TOTAL POPULATION (MALES AND FEMALES COMBINED) WITH ACTIVELY TREATED URAEMIA

Region: Danmark

						Scaling: 10,000								Scaling: 10,000								Scaling: 100			
	INCIDENCE, by age at onset								**PREVALENCE, by current age**								**MORTALITY, by age at death**								
YEAR	<35	35-54	55-74	>75	TOTAL	Stand.rate	C.L.$_{low}$	C.L.$_{high}$	<35	35-54	55-74	>75	TOTAL	Stand.prop.	C.L.$_{low}$	C.L.$_{high}$	<35	35-54	55-74	>75	TOTAL	Stand.rate	C.L.$_{low}$	C.L.$_{high}$	Obs/Exp
1989									351	734	588	28	1,701	3.41	3.24	3.57									
1990	54	118	145	10	327	0.66	0.59	0.73	373	787	664	36	1,860	3.72	3.55	3.89	9	49	98	12	168	13.12	11.21	15.26	8.83
1991	52	113	187	13	365	0.73	0.66	0.81	386	828	739	57	2,010	4.00	3.83	4.18	11	64	130	9	214	13.11	11.41	14.99	9.76
1992	58	101	170	22	351	0.70	0.63	0.78	399	847	780	64	2,090	4.14	3.97	4.32	10	62	169	28	269	17.99	15.90	20.27	11.50
1993	63	157	238	38	496	0.99	0.90	1.08	422	917	865	85	2,289	4.51	4.32	4.69	10	69	180	37	296	17.80	15.83	19.95	10.84
1994	67	129	213	33	442	0.87	0.79	0.96	445	946	930	91	2,412	4.73	4.54	4.92	5	78	185	49	317	18.54	16.55	20.69	11.00
1995	76	141	238	44	499	0.98	0.90	1.07	476	995	965	113	2,549	4.97	4.78	5.17	13	67	227	55	362	19.23	17.30	21.32	11.27
1996	60	145	242	57	504	0.99	0.91	1.08	497	1,054	1,003	158	2,712	5.25	5.06	5.45	5	75	201	63	344	16.47	14.77	18.30	9.59
1997	67	144	270	65	546	1.07	0.98	1.16	507	1,103	1,066	189	2,865	5.51	5.31	5.72	10	79	234	69	392	16.97	15.33	18.74	10.08
1998	58	155	261	104	578	1.12	1.03	1.22	516	1,141	1,141	230	3,028	5.78	5.58	5.99	12	74	229	98	413	16.79	15.21	18.49	9.93
1999	53	165	337	96	651	1.25	1.16	1.35	494	1,214	1,273	283	3,264	6.18	5.97	6.39	18	75	240	87	420	14.95	13.55	16.45	8.74
2000	64	167	354	120	705	1.34	1.24	1.44	504	1,258	1,395	329	3,486	6.53	6.31	6.75	9	80	265	130	484	15.80	14.42	17.27	8.92
2001	46	165	369	165	745	1.40	1.30	1.50	481	1,329	1,500	425	3,735	6.92	6.70	7.14	5	76	289	125	495	14.36	13.12	15.68	7.70
2002	47	134	362	161	704	1.30	1.20	1.40	460	1,344	1,623	475	3,902	7.14	6.92	7.36	9	78	281	167	535	14.05	12.88	15.29	7.40
2003	52	145	363	153	713	1.30	1.20	1.40	464	1,373	1,735	504	4,076	7.39	7.16	7.62	5	68	276	191	540	13.25	12.15	14.41	6.99
2004	61	157	331	172	721	1.30	1.21	1.40	474	1,415	1,793	556	4,238	7.63	7.40	7.86	6	72	290	191	559	12.95	11.90	14.07	6.72
2005	36	142	325	158	661	1.18	1.09	1.27	460	1,424	1,851	594	4,329	7.76	7.53	7.99	6	70	306	188	570	12.72	11.70	13.81	6.45
2006	46	117	327	170	660	1.17	1.09	1.27	454	1,429	1,930	607	4,420	7.86	7.63	8.09	7	69	253	236	565	11.94	10.97	12.96	6.20
2007	57	165	372	207	801	1.42	1.32	1.52	463	1,489	2,049	669	4,670	8.24	8.00	8.47	5	63	261	222	551	10.97	10.08	11.93	5.66
2008	49	104	291	199	643	1.13	1.04	1.22	454	1,501	2,115	744	4,814	8.42	8.18	8.66	6	54	256	185	501	9.38	8.58	10.24	4.66

Standardpopulations refer to year 2000

Figure 1A. Incidence of actively treated uraemia in Denmark



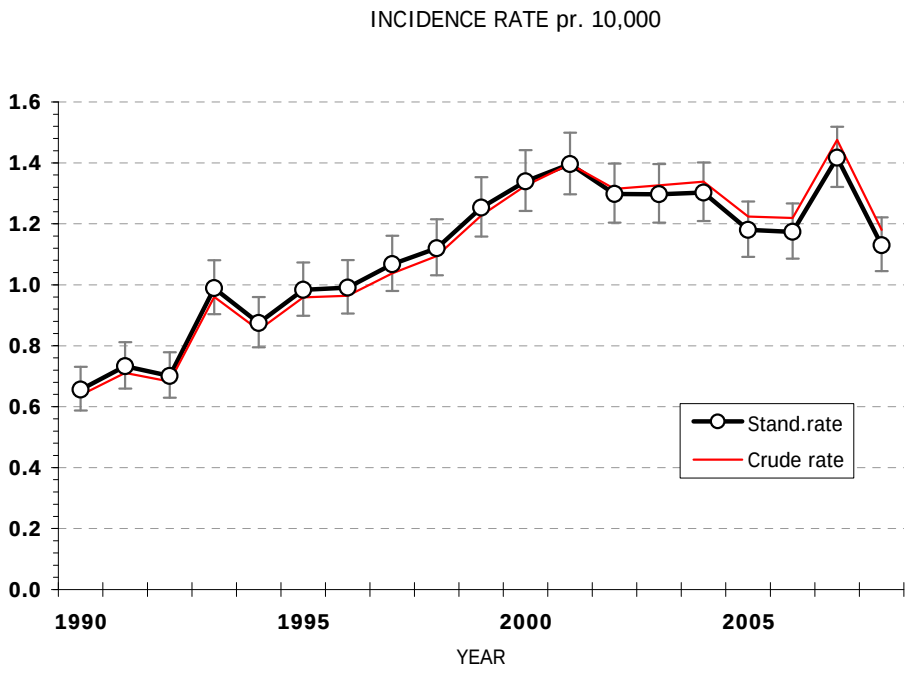


Figure 1B. Incidence analysis 1990-2008

REGION: Danmark. PERIOD: 1990 through 2008. Length: 19 years

DATE OF ANALYSIS: 19. Jul , 2009

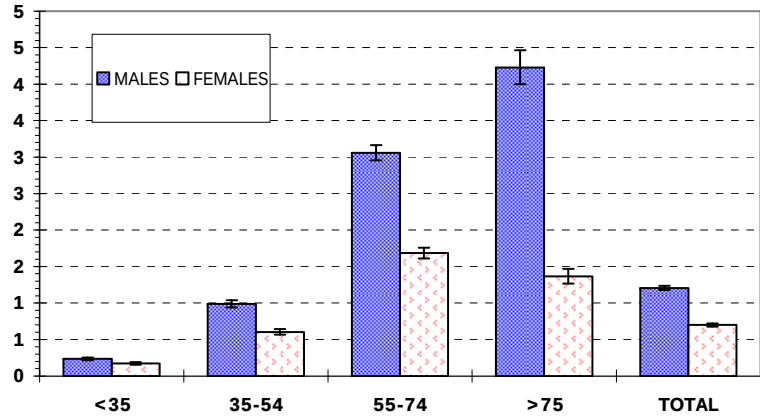
AGE AT DIAGNOSIS

MALES:	<35	35-54	55-74	>75	TOTAL
No. of new cases	628	1670	3390	1283	6971
Obs.years at risk	26,722,210	16,907,279	11,083,510	3,035,326	57,748,325
Incidence rate	**0.24**	**0.99**	**3.06**	**4.23**	**1.21**
C.L., lower: (a)	0.22	0.94	2.96	4.00	1.18
C.L., higher: (a)	0.25	1.04	3.16	4.46	1.24
FEMALES:	<35	35-54	55-74	>75	TOTAL
No. of new cases	438	994	2005	704	4141
Obs.years at risk	25,647,256	16,437,769	11,909,711	5,157,048	59,151,784
Incidence rate	**0.17**	**0.60**	**1.68**	**1.37**	**0.70**
C.L., lower: (a)	0.16	0.57	1.61	1.27	0.68
C.L., higher: (a)	0.19	0.64	1.76	1.47	0.72
MALES+FEMALES:	<35	35-54	55-74	>75	TOTAL
No. of new cases	1066	2664	5395	1987	11112
Obs.years at risk	52,369,466	33,345,048	22,993,221	8,192,374	116,900,109
Incidence rate	**0.20**	**0.80**	**2.35**	**2.43**	**0.95**
C.L., lower: (a)	0.19	0.77	2.28	2.32	0.93
C.L., higher: (a)	0.22	0.83	2.41	2.53	0.97

(a): Calculated under the assumption of approx. Poisson distribution

Scaling factor: **10,000** Significance level: **5%**

AGE-SPECIFIC INCIDENCE RATES

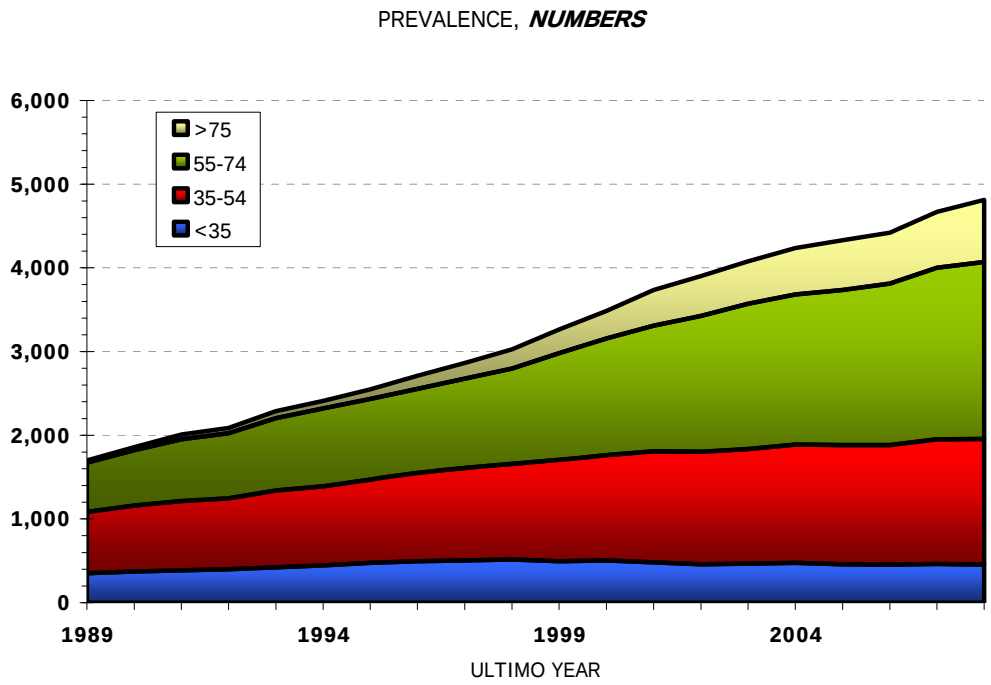


EVALUATION OF SEX DIFFERENCE:

	AGE INTERVAL: <35	35-54	55-74	>75	TOTAL
Total chi-square, df=1:	26.525	153.059	462.652	645.177	1092.997
P =	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**
Crude ratio, M/F:	**1.38**	**1.63**	**1.82**	**3.10**	**1.72**

	χ^2	DF	P
Test of homogeneity over years:	809.366	18	**<0.001**

Figure 2A. Prevalence of actively treated uraemia in Denmark.



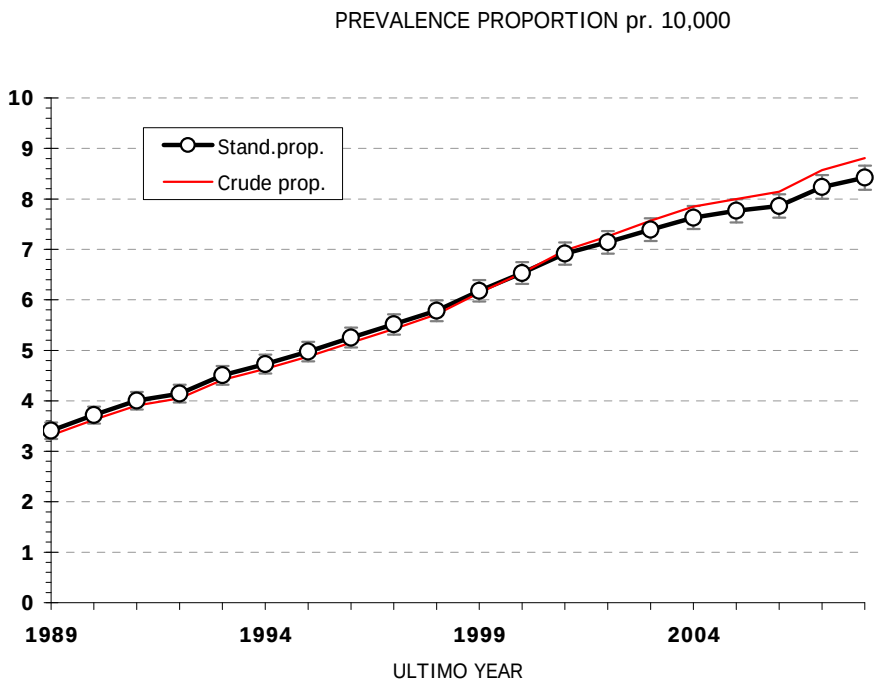


Figure 2B. Prevalence analysis, year 2003

REGION: Danmark. YEAR FOR ANALYSIS: 2003 (Ultimo year)

DATE OF ANALYSIS: 19. Jul , 2009

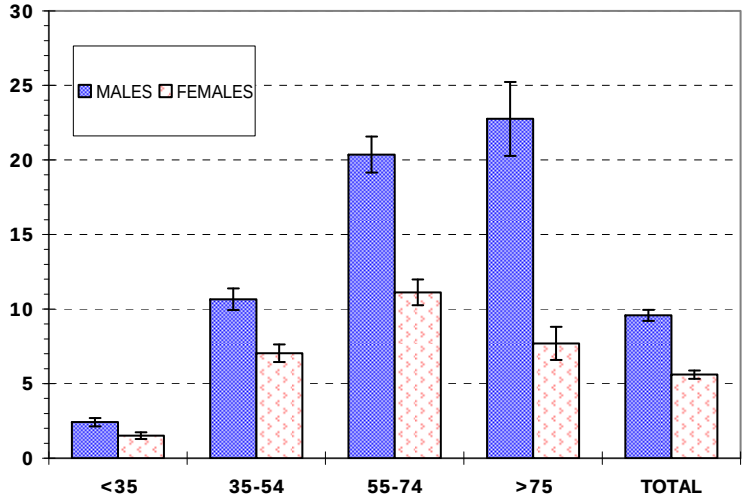
CURRENT AGE

MALES:	<35	35-54	55-74	>75	TOTAL
No. of prevalent cases	290	836	1104	321	2551
Population size	1,197,105	784,029	542,284	141,060	2,664,478
Prevalence Proportion	**2.42**	**10.66**	**20.36**	**22.76**	**9.57**
C.L., lower: (a)	2.14	9.94	19.16	20.27	9.20
C.L., higher: (a)	2.70	11.39	21.56	25.24	9.95
FEMALES:	<35	35-54	55-74	>75	TOTAL
No. of prevalent cases	174	537	631	183	1525
Population size	1,153,821	763,092	567,841	237,839	2,722,593
Prevalence Proportion	**1.51**	**7.04**	**11.11**	**7.69**	**5.60**
C.L., lower: (a)	1.28	6.44	10.25	6.58	5.32
C.L., higher: (a)	1.73	7.63	11.98	8.81	5.88
MALES+FEMALES:	<35	35-54	55-74	>75	TOTAL
No. of prevalent cases	464	1373	1735	504	4076
Population size	2,350,926	1,547,121	1,110,125	378,899	5,387,071
Prevalence Proportion	**1.97**	**8.87**	**15.63**	**13.30**	**7.57**
C.L., lower: (a)	1.79	8.41	14.89	12.14	7.33
C.L., higher: (a)	2.15	9.34	16.36	14.46	7.80

(a): Calculated under the assumption of binomial distribution

Scaling factor: **10,000** Significance level: **5%**

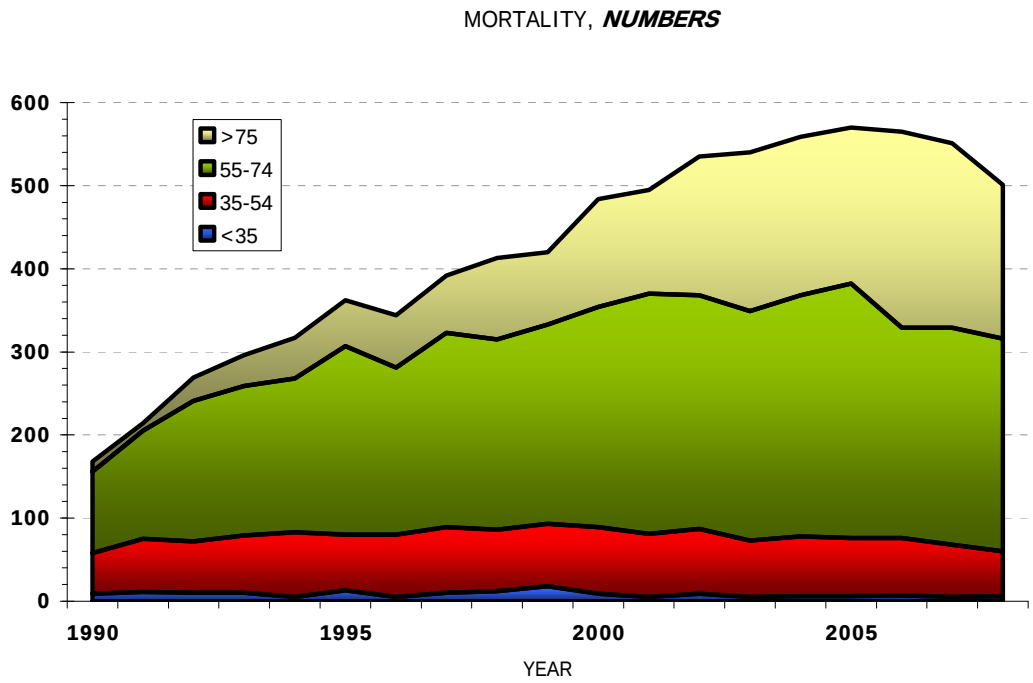
AGE-SPECIFIC PREVALENCE PROPORTIONS



EVALUATION OF SEX DIFFERENCE:

	AGE INTERVAL: <35	35-54	55-74	>75	TOTAL
Total chi-square, df=1:	24.894	57.283	151.729	151.015	334.844
P =	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**
Crude ratio, M/F:	**1.61**	**1.52**	**1.83**	**2.96**	**1.71**

Figure 3A. Mortality in actively treated uraemia in Denmark.



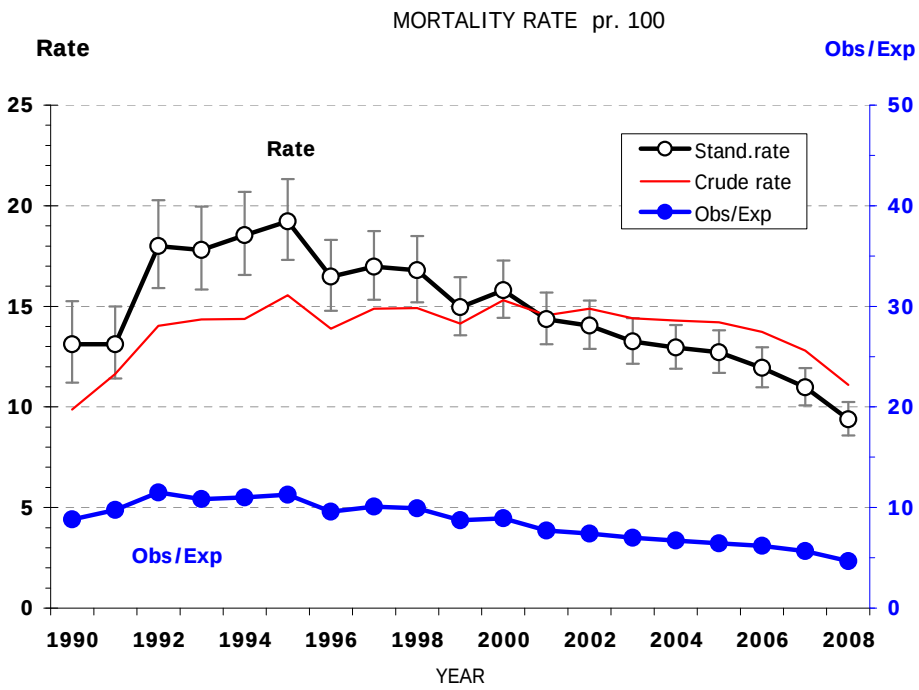


Figure 3B. Mortality analysis 1990-2008

LENGTH OF OBS.PERIOD: 19 years **PERIOD: 1990 through 2008**

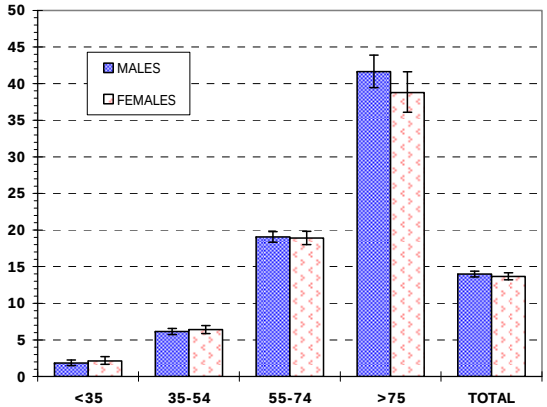
DATE OF ANALYSIS: 19. Jul , 2009

	AGE AT DEATH				
MALES:	<35	35-54	55-74	>75	TOTAL
No. of deaths	92	804	2693	1371	4960
Obs.years at risk	4,983	13,091	14,128	3,292	35,494
Mortality rate	**1.85**	**6.14**	**19.06**	**41.65**	**13.97**
C.L., lower: (a)	1.49	5.72	18.35	39.47	13.59
C.L., higher: (a)	2.26	6.58	19.80	43.91	14.37
Expected no. of deaths	3.36	47.65	313.38	361.90	726.30
(Obs-Exp)/Obs (per 100)	**96.35**	**94.07**	**88.36**	**73.60**	**85.36**
Obs/Exp	**27.39**	**16.87**	**8.59**	**3.79**	**6.83**
FEMALES:	<35	35-54	55-74	>75	TOTAL
No. of deaths	69	518	1677	771	3035
Obs.years at risk	3,238	8,092	8,872	1,989	22,190
Mortality rate	**2.13**	**6.40**	**18.90**	**38.77**	**13.68**
C.L., lower: (a)	1.66	5.86	18.01	36.08	13.19
C.L., higher: (a)	2.70	6.98	19.83	41.61	14.17
Expected no. of deaths	0.97	19.28	134.45	171.72	326.41
(Obs-Exp)/Obs (per 100)	**98.60**	**96.28**	**91.98**	**77.73**	**89.25**
Obs/Exp	**71.25**	**26.87**	**12.47**	**4.49**	**9.30**
MALES+FEMALES:	<35	35-54	55-74	>75	TOTAL
No. of deaths	161	1322	4370	2142	7995
Obs.years at risk	8222	21182	23000	5280	57,684
Mortality rate	**1.96**	**6.24**	**19.00**	**40.56**	**13.86**
C.L., lower: (a)	1.67	5.91	18.44	38.86	13.56
C.L., higher: (a)	2.29	6.59	19.57	42.32	14.17
Expected no. of deaths	4.33	66.93	447.83	533.62	1052.71
(Obs-Exp)/Obs (per 100)	**97.31**	**94.94**	**89.75**	**75.09**	**86.83**
Obs/Exp	**37.20**	**19.75**	**9.76**	**4.01**	**7.59**

(a): Calculated under the assumption of approx. Poisson distribution

Scaling factor: **100** Significance level: **5%**

AGE-SPECIFIC MORTALITY RATES



EVALUATION OF SEX DIFFERENCE:

	AGE INTERVAL:				
	<35	35-54	55-74	>75	TOTAL
Total chi-square, df=1:	0.812	0.541	0.072	2.525	0.349
P =	**0.368**	**0.462**	**0.789**	**0.112**	**0.555**
Crude ratio, M/F:	**0.87**	**0.96**	**1.01**	**1.07**	**1.02**

	χ^2	DF	P
Test of homogeneity over years:	257.117	18	**<0.001**

Figure 4. Estimated and forecast incidence and mortality rates 1990-2020, by age groups according to age at onset of uremia.

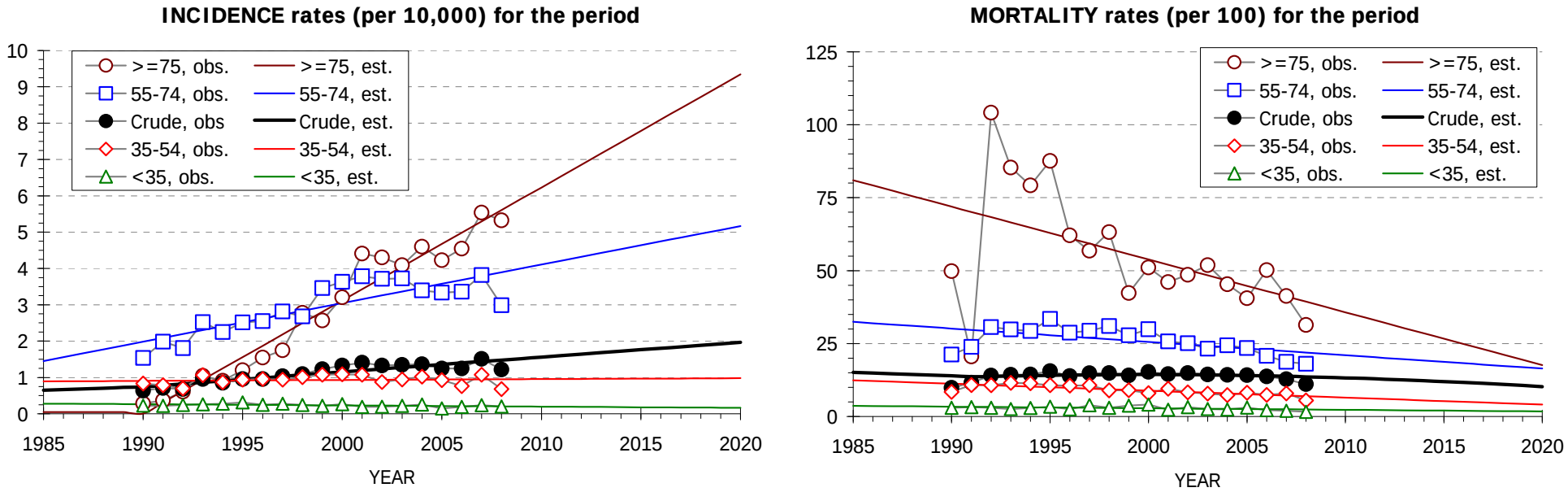
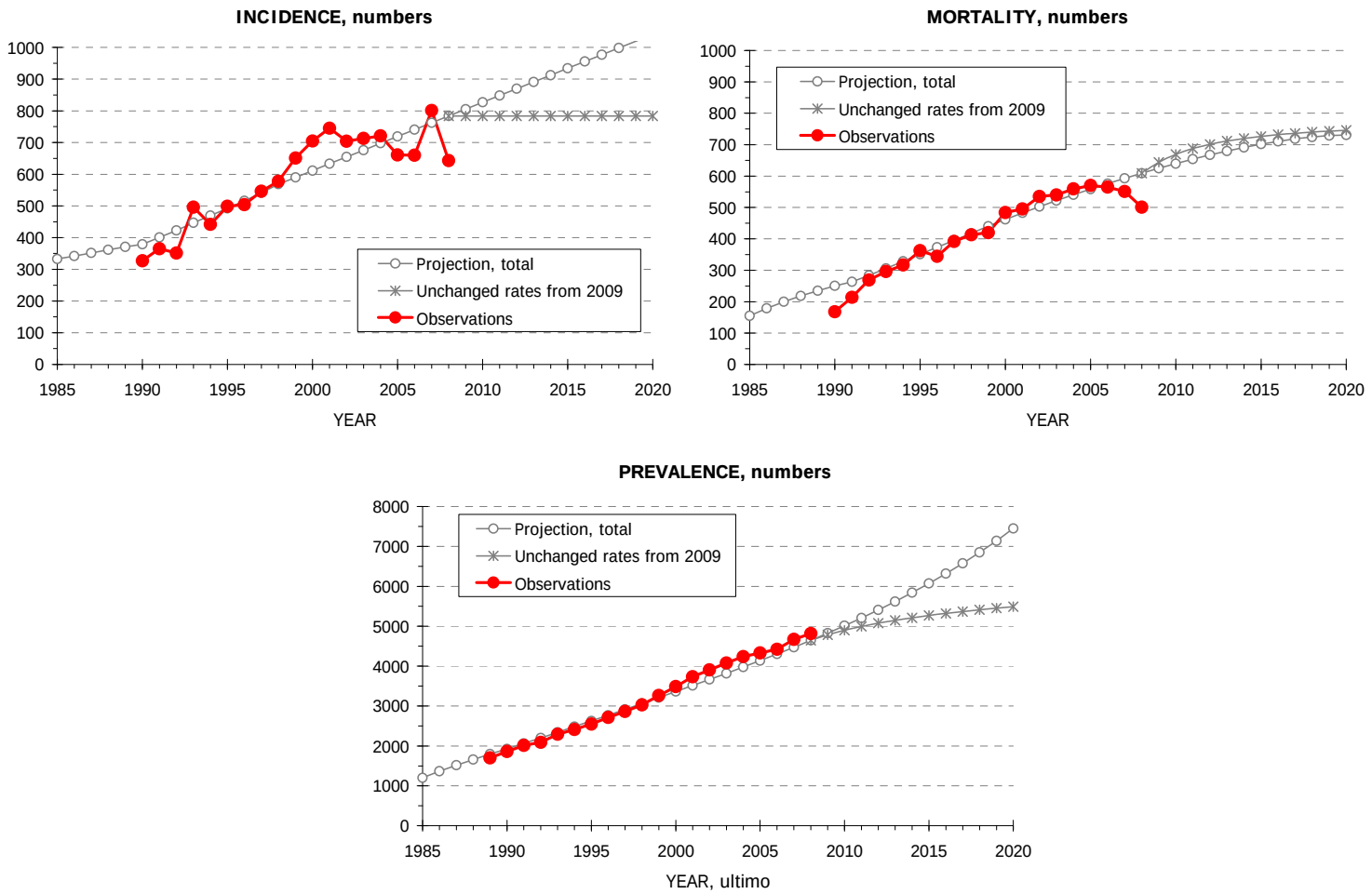


Figure 5. Observed & projected annual incidence, mortality and prevalence in absolute numbers, 1990-2020.



Parathyroidectomy Epidemiology 1990-2007

Introduction and Methods

Requirement for parathyroidectomy (PTX) is a frequent complication for patients with ESRD. The National Patient Registry contains data concerning all PTX performed from 1977-now, and merging this database with DNSL permits a study of the epidemiology of this operation. A multivariate Cox proportional hazards analysis including patient age, sex, and renal diagnosis was performed to identify independent risk factors for the operation

Results

686 PTX were included. For some analyses only the 564 PTX since 1.1.1990 were included. Of all 686 PTX, 637 (93%) were first operations, 45 (6%) second, 3 (0,4%) third, and 1 (0,1%) fourth operations.

The incidence of PTX increased during the time period (Fig. 1). However, after adjusting for increasing patient numbers, there has been no change in PTX incidence during the time period. The age distribution is shown in Fig. 2. The average age at operation was 41,7 years prior to 1990, but increased to 51,9 years in 1995-99, and has since remained stable at around 50 years. 16% of PTX were performed before onset of ESRD, 43% on HD patients, 19% on PD patients and 23% on transplanted patients. 1% of ESRD had already had PTX before ESRD. After initiation of active treatment for ESRD, PTX incidence accelerated during the first three years, and then stabilized at 1%/year (Fig. 3). Operation types changed during the time period (Fig. 4), but it was not clear whether this was partly influenced by changes in nomenclature.

On an intention-to- treat model (i.e. all PTX registered under first treatment modality), there was no difference in PTX incidence between HD, PD and Transplant patients. On an As-treated model (i.e. PTX registered under actual therapy), some differences were seen (Fig. 6). For transplant patients PTX was common during the first three years of therapy, thereafter becoming rare, while PD and HD patients experienced accelerating rates after 3 and 5 years respectively. PTX frequency was higher in PD than HD.

Female patients had a higher PTX incidence (11,5% vs. 7,5% at 10 years, excluding pre-ESRD PTX). Increasing age reduced PTX incidence (Fig. 6). For patients requiring a second PTX, the time to second PTX was less than 1 year in 50%, suggesting a “failed” first operation for these patients. Re-PTX frequency dropped dramatically thereafter, with a median time to re-PTX of 5 years. Independent risk factors for PTX are shown in Table 1.

Patient mortality after operation was 6%/year. There was no increase in mortality immediately postoperatively.

Comments

Despite considerable changes in the therapy of uremic osteodystrophy, the incidence of PTX has remained largely unchanged. Operation is more common among females and younger patients. While largely a dialysis complication, 3% of translanted patients will require PTX during the first three years after transplantation.

Table 1. Risk Factors for Parathyroidectomy.

*:p<0.05; ***:p<0.001

	Hazard Ratio
Age (decade)	0,87***
Sex (female)	1,51***
Diabetic Nephropathy	0,66*
Chronic Interstitial Nephropathy	0,66*

Fig. 1. Parathyroidectomy in Denmark 1990-2007

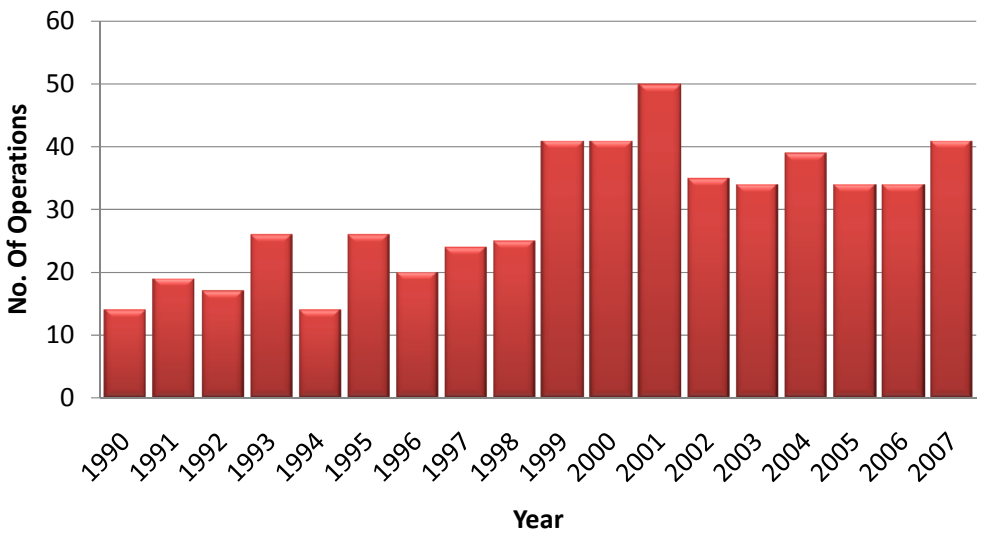


Fig. 2. Age at Parathyroidectomy

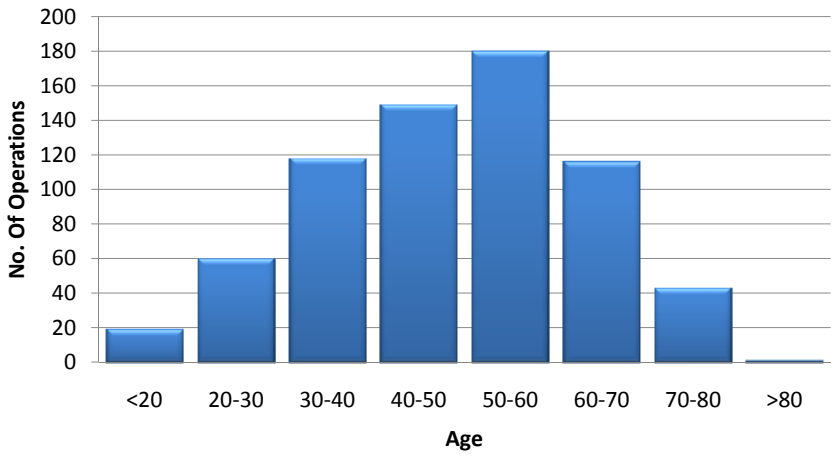


Fig.3. Parathyroidectomy Incidence before and after ESRD

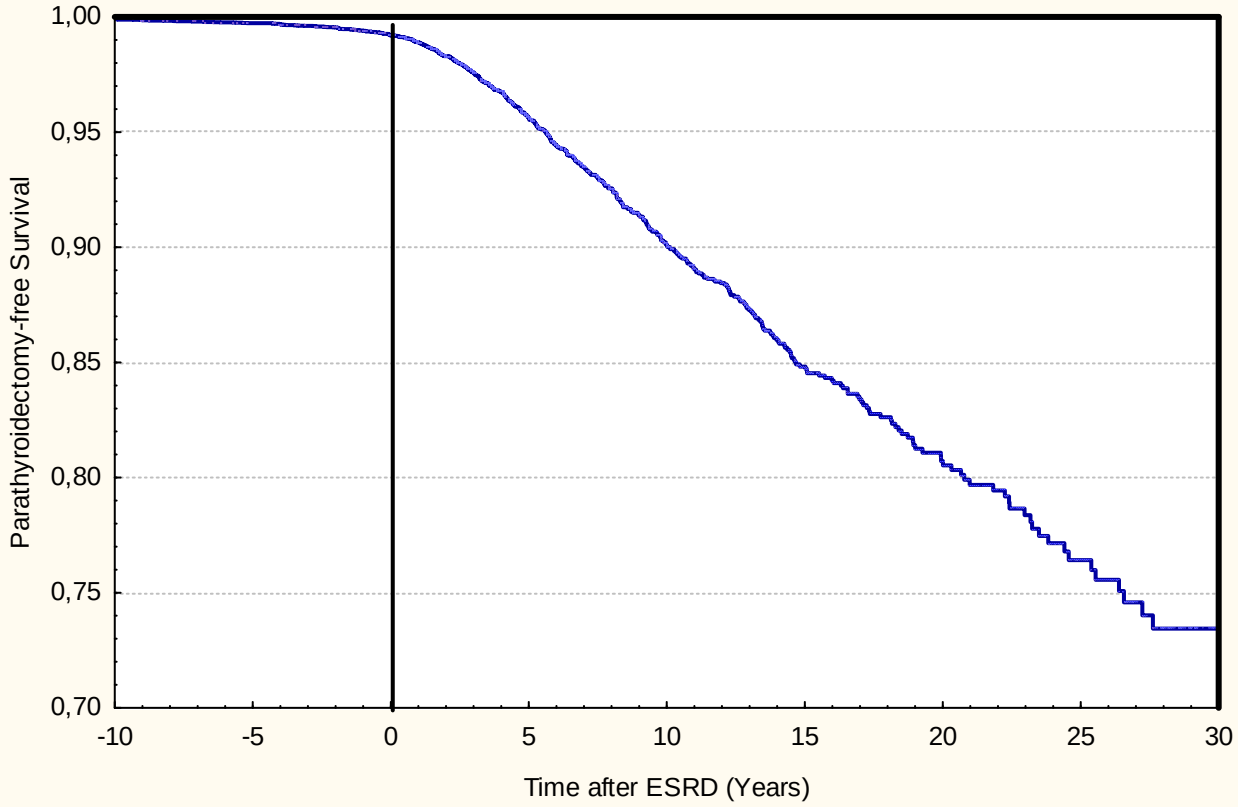


Fig.4. Parathyroidectomy Operation Types

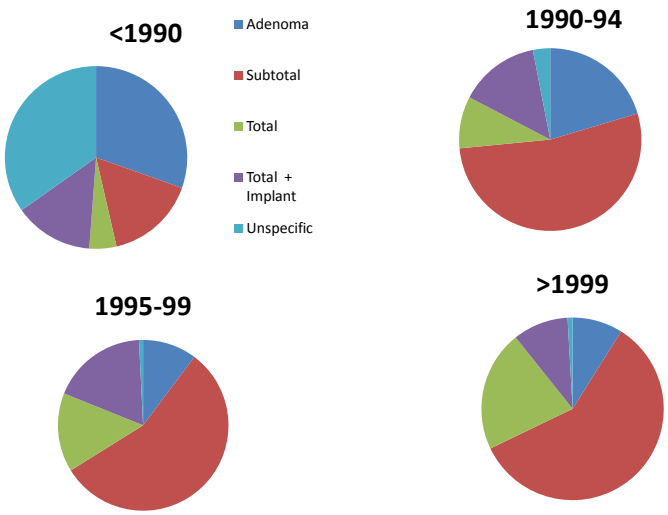


Fig.5. PTX and Age

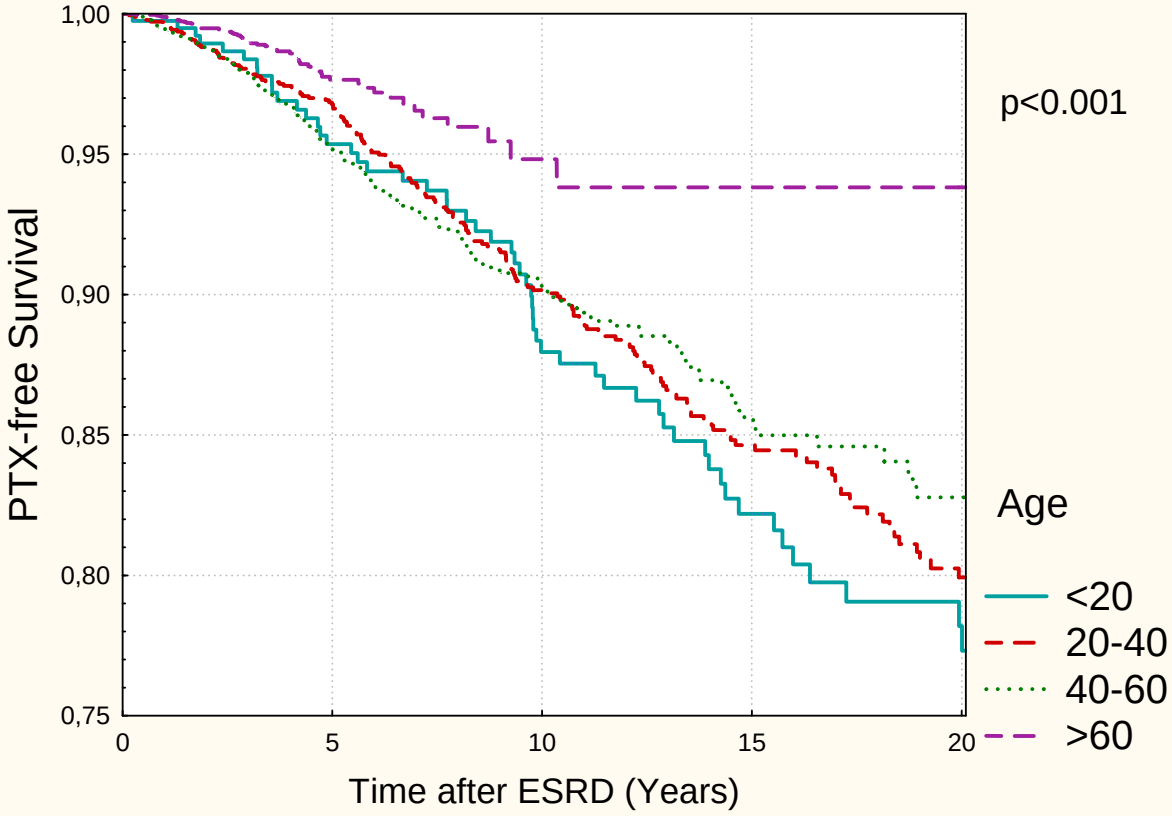
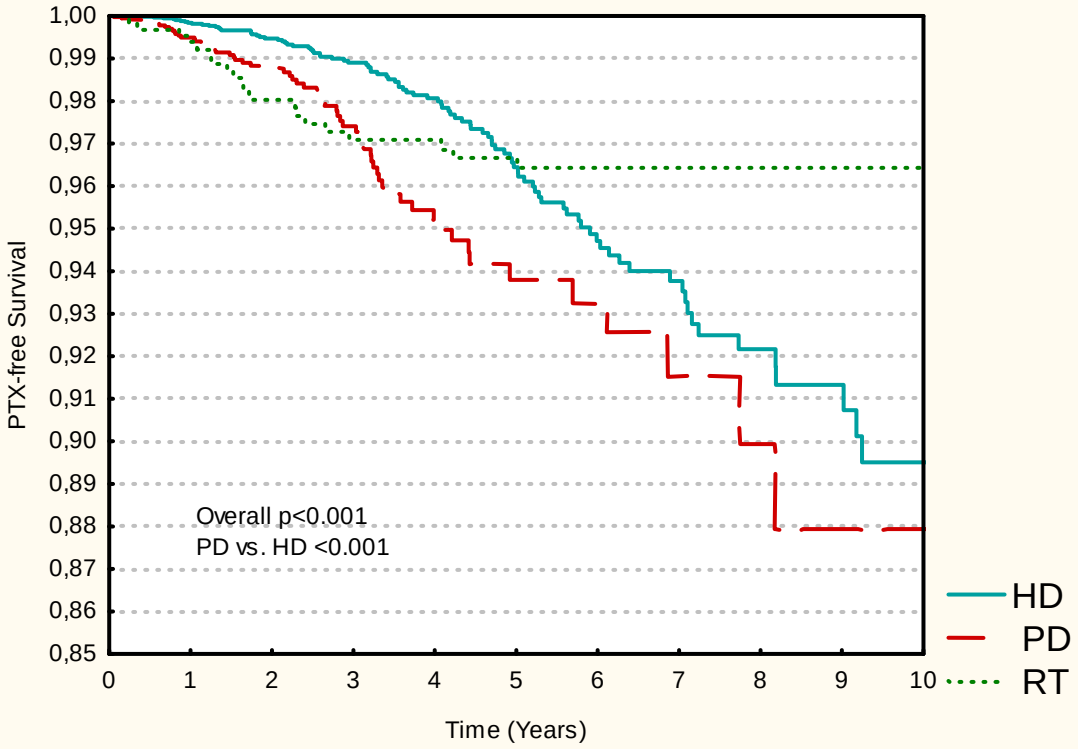


Fig. 6 PTX and Treatment Modality (As Treated)



Transplant Rejection 1990-2007

Introduction and Methods

Renal transplant rejections have been registered in DNSL prospectively since 1990. In addition, histological diagnoses have been available in the Danish Renal Biopsy Register (Danybir) from 1.1.1990 to 1.1.2002, and in the Danish Registry of Pathology (Patobank) from 1.1.1997 to now. Merging these databases permits an analysis of developments in rejection frequency during the past 20 years, factors influencing rejection, and its consequences. Other factors affecting transplant survival were also studied

In this study only Danish transplants performed between 1.1.1990 and 31.12.2007 were included. All registered acute rejections in DNSL, Danybir or Patobank. To avoid double registration, all registered rejections occurring within 10 days of each other were assessed as one rejection starting on the first recorded day: i.e. by definition, patients could not have more than one rejection within 10 days. A multivariate Cox proportional hazards analysis was performed to identify independent risk factors for outcomes.

Results

1132 rejections were recorded in 3101 transplants. 1974 (64%) transplants had no rejection episodes, 769 (25%) one, 244 (8%) two, 85 (3%) three, and 29 (1%) four or more. Banff grade was available in 557 biopsies. Of these 20% were borderline, 32% grade 1a, 20% 1b, 18% 2a, 6% 2b and 5% grade 3.

Overall transplant results are shown in Table 1. Continuous improvements in mortality, graft loss (GL) and delayed graft function, rejection incidence (RI) and GL after first rejection were seen during the period of observation. The improvement in RI was particularly marked during the first three weeks after transplantation (Fig. 1).Mortality was lower with living donors, but differences in GL were marginal. Donor weight had no effect on prognosis, but recipients from donors >180 cm tall had a lower GL than smaller patients (14 vs. 21%, p=0,05). Delayed graft function (DGF) was longer in donors >50 years (34% vs. 27%, DGF>5 days 22 vs. 13%). GL was higher with older donors (Fig.2), but this effect was only present for dead donors (Fig. 3).

Rejection Correlates

Rejection correlates are shown in Table 2 and Figs. 3-13. RI was lower for donors <40 years (Fig. 4), and this effect was seen in all cohorts (Fig.3). Sibling donors with two common haplotypes had less than half the RI than other living donors, there being little difference between the other rela-

tionship groups. GL was higher for each successive rejection (Fig. 5), but differences between 2nd, 3rd and 4th rejection were small. First rejections occurring within the first week and after the first year had a worse prognosis than in between (Table 3).
Patients with DGF had a higher RI and GL, and the detrimental effect of GL increased with time(Fig. 6). AB mismatches increased RI and GL in all cohorts (Fig. 7), as did DR mismatches (fig. 8). The relevant importance of DR mismatch on GL declined over time. Immunized recipients (presence of panel reactive antibodies) had higher RI and GL in all cohorts. (Fig. 9). Increasing Banff grade increased GL (fig. 10), and there was a trend towards a greater detrimental effect of Banff grade with increasing rejection number. There was a trend towards milder rejections over time (Fig. 11). Presence of chronic allograft nephropathy ("chronic rejection") worsened the prognosis (GL), and occurred more often with increasing rejection number (fig. 12).
There was no relationship between RI and mortality. Increasing recipient age resulted in lower RI and GL, with the exception of recipients <20 years, who had low RI and GL (Fig. 13). Pretransplantation dialysis duration had no effect on RI, but increased GL for dead donors, but not live donors (Fig. 14). Since 2000 there has been no significant difference in rejection incidence between the four transplant centers, with 3 month RI varying between 17-23% and 1-year RI 22-30%.
Independent risk factors for outcomes are shown in Table 5.

Discussion

Considerable improvements in RI, GL, DGF and mortality have been seen during the past 18 years. These can be attributed to introduction of the brain death criterion, improved pre-, per- and post-operative control of recipient circulation, and improvements in immunosuppression. Both immunological and non-immunological factors are important for outcomes. The relationship between DGF and RI shows that immunological and non-immunological factors are interrelated. Assuming that this is causal, a reduction in DGF incidence has the possibility of substantial improvements in outcomes in the future.
James Heaf

Table 1. Cohort Effects. Figures in %. Figures in brackets: prognosis.

		1990-94	1995-99	2000-04	2005-07
Mortality	1 year	5,0	3,4	2,7	2,0
	5 year	15,5	9,5	7,1	(7)
Graft Loss	1 year	15	13	7	5
	5 year	33	26	16	(16)
Patient and Graft Loss	1 year	21	16	9	7
	5 year	44	33	22	(22)
Donor Type(Living/Dead)					
1-year Mortality, Living	Living	1,5	1,5	1,5	0,8
	Dead	6,2	4,2	3,0	2,6
5-year Mortality	Living	9,2	6,5	4,7	(2)
	Dead	24	16	11	(7)
1-year Graft Loss	Living	15	8	6,8	2,5
	Dead	18	16	7,2	4,6
5-year Graft Loss	Living	35	23	14	(10)
	Dead	33	28	16	(9)
Delayed Graft Function (>0 days)	Living	19	15	13	7,5
	Dead	59	4,7	30	29
	Combined	48	38	25	21
Rejection Incidence	3 month	28	28	24	12
	1 year	34	32	30	19
Graft Loss after 1st Rejection	3 month	41	36	16	10
	1 year	47	41	21	14

Table 2. Rejection Incidence Correlates (%)

	3 month	1 year
Donor Age <40 years	18	24
Donor Age >40 years	22	31
Donor Relation		
Parent	23	32
Sibling 2 haplotypes	11	12
Sibling 1 haplotype	22	27
Sibling 0 hplotype	28	33
Other family	27	29
Unrelated	32	35
AB Mismatch		
0	17	22
1	20	28
2	23	28
3	25	32
4	26	29

Table 3. Time to 1st Rejection and Graft Loss (%)

	1 year	5 year
<1 week	32	50
1-52 weeks	17	32
>1 year	29	70

Table 4. Delayed Graft Function and Banff Grade

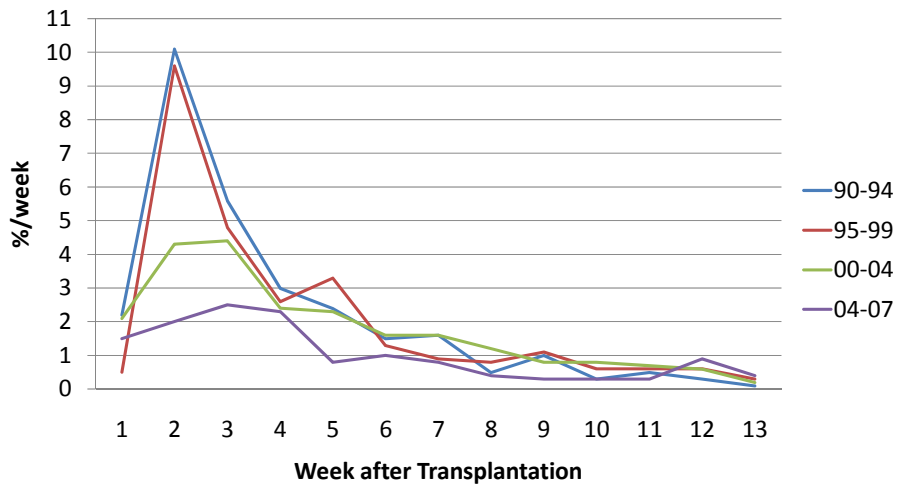
%	No DGF	DGF
Borderline	22	18
Grade 1	52	42
Grade 2	22	32
Grade 3	3	7

Table 5. Independent Risk for Outcomes .

NI: not included. *:p<0.05; **p<0.01; ***:p<0.001

	Rejection	Graft Loss	Graft Loss & Death	Death
Cohort (decade)	0,57***	0,47***	0,48***	0,48***
Delayed Graft Function	1,46***	1,16*	1,27***	1,58***
High Immunity	1,89*	2,85***	2,35***	
Immunity	1,22*	1,86***	1,61***	
AB Mismatch Number	1,08*	1,08*		
DR Mismatch Number	1,13*	1,23***		
Donor Age (decade)	1,14*	1,21***	1,14***	
Recipient Age (decade)	0,93**	0,97*	1,05**	1,33***
Transplant Number		1,23***	1,10*	
Rejection Number	NI	1,31	1,24***	
Banff Grade	NI	1,32		
Dead Donor			1,19**	1,76***

Fig. 1. Rejection Frequency & Cohort



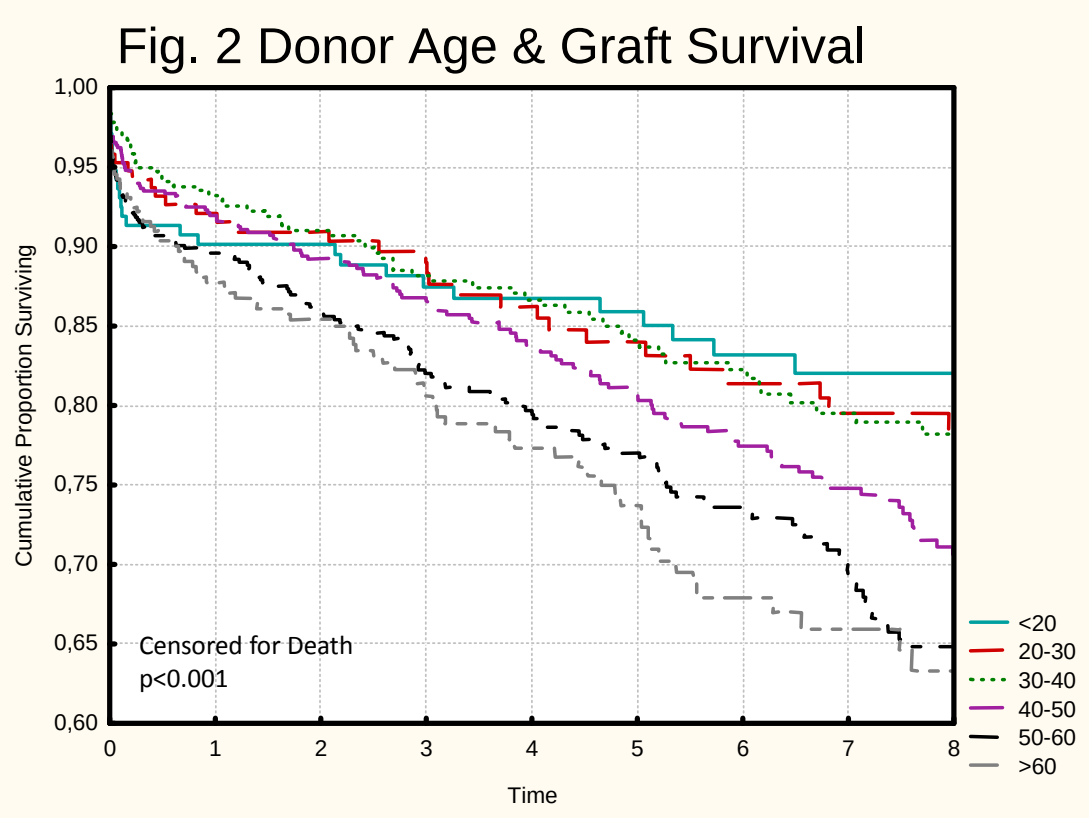


Fig. 2 Donor Age & Graft Survival
Cumulative Proportion Surviving
1,00
0,95
0,90
0,85
0,80
0,75
0,70
0,65
0,60
0
1
2
3
4
5
6
7
8
Time
Censored for Death
p<0.001
<20
20-30
30-40
40-50
50-60
>60

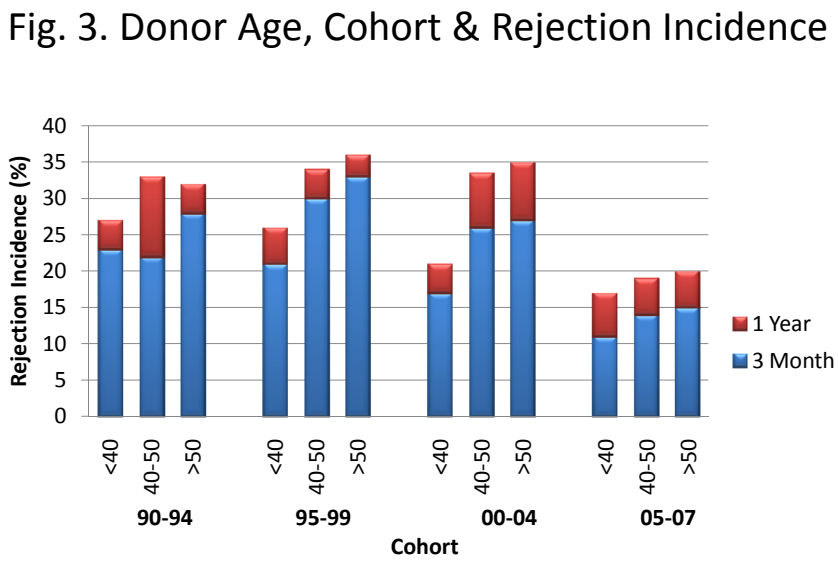
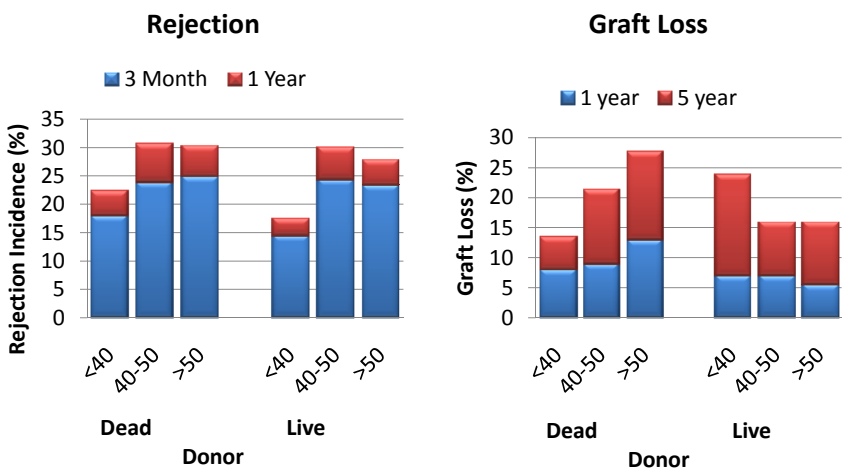


Fig. 3. Donor Age, Cohort & Rejection Incidence
Rejection Incidence (%)
40
35
30
25
20
15
10
5
0
<40
40-50
>50
90-94
95-99
00-04
05-07
Cohort
1 Year
3 Month

Fig. 4. Donor Age, Rejection and Graft Loss



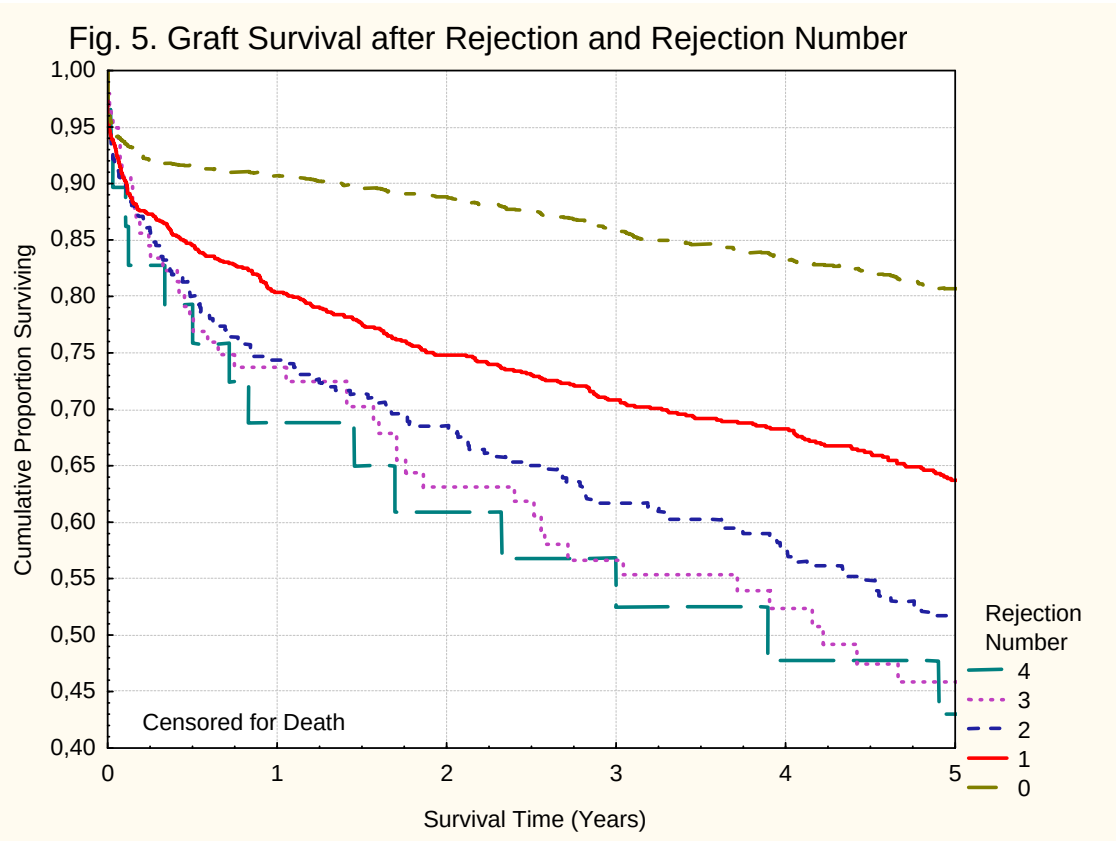


Fig. 6. Delayed Graft Function, Rejection and Graft Loss

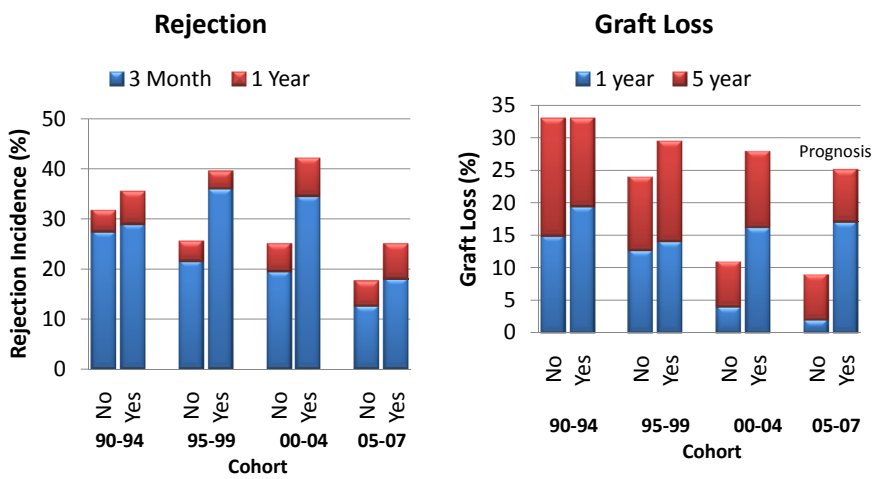


Fig. 7. AB Mismatch Number, Rejection and Graft Loss

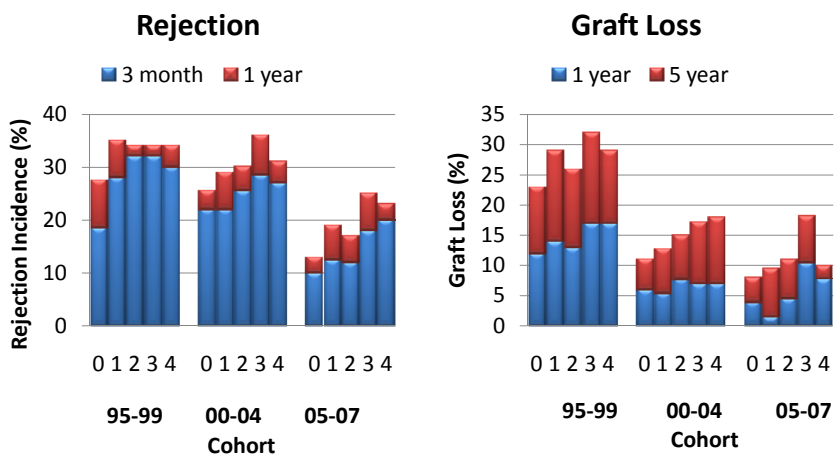


Fig. 8. DR Mismatch Number, Rejection and Graft Loss

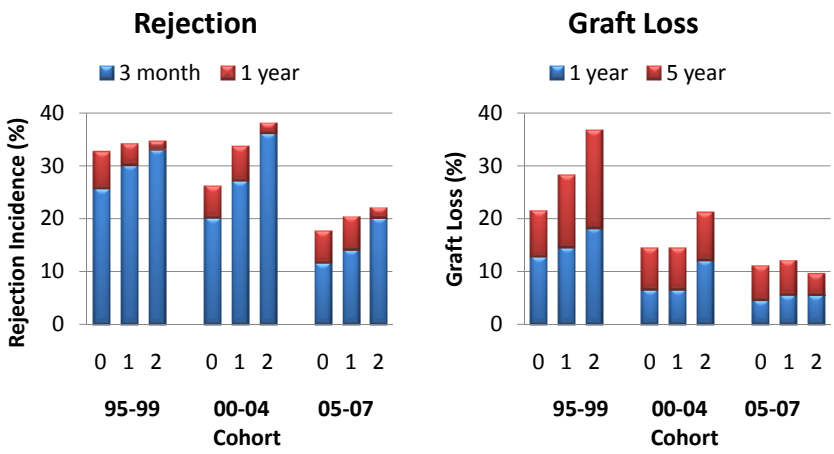


Fig. 9. Immunisation, Rejection & Graft Loss

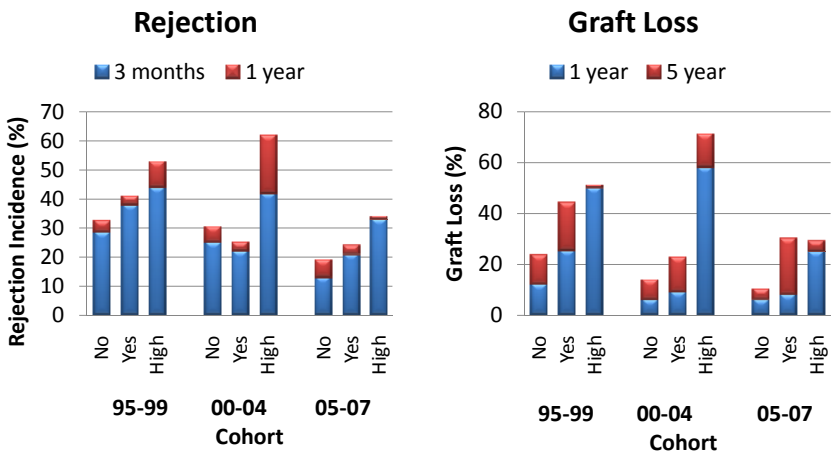


Fig. 10. Banff Grade & Rejection Number

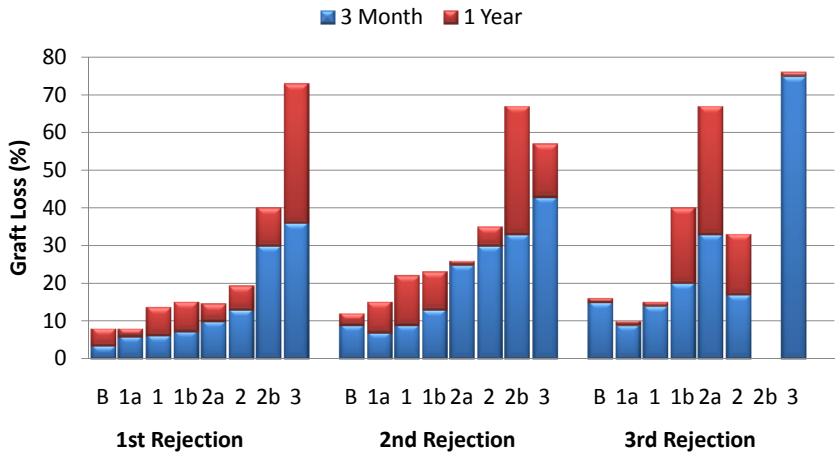


Fig. 11. Banff Grade & Cohort

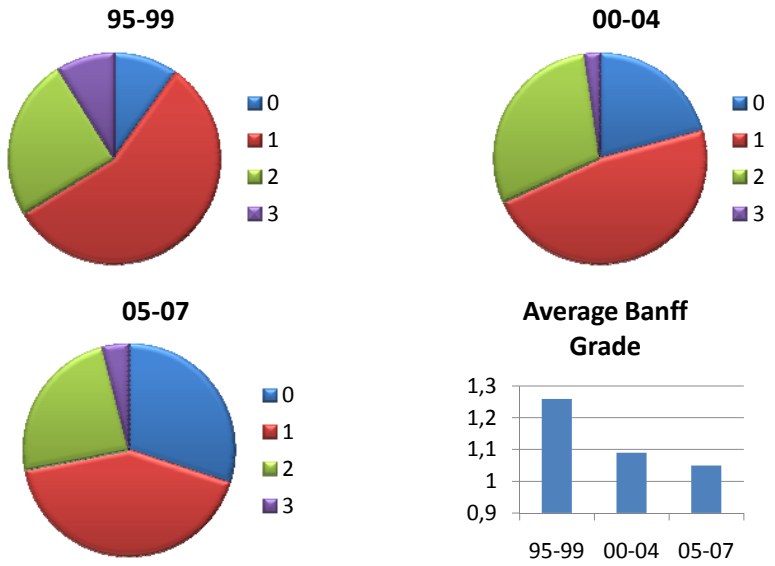


Fig. 12. Chronic Rejection, Rejection Number & Graft Loss

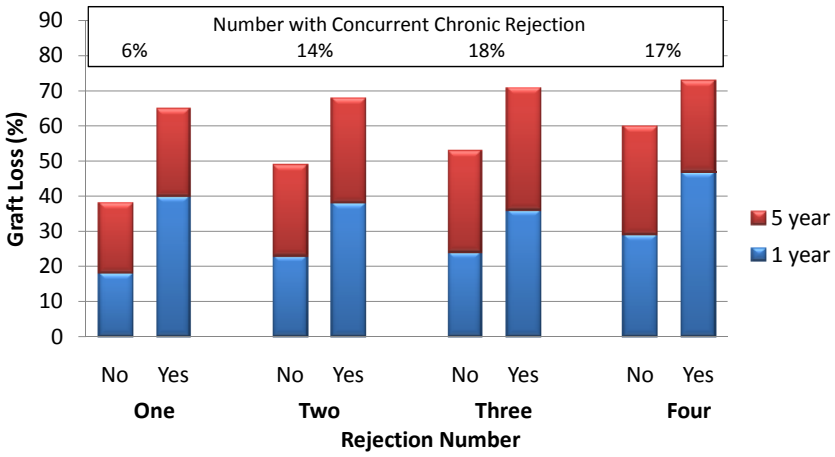
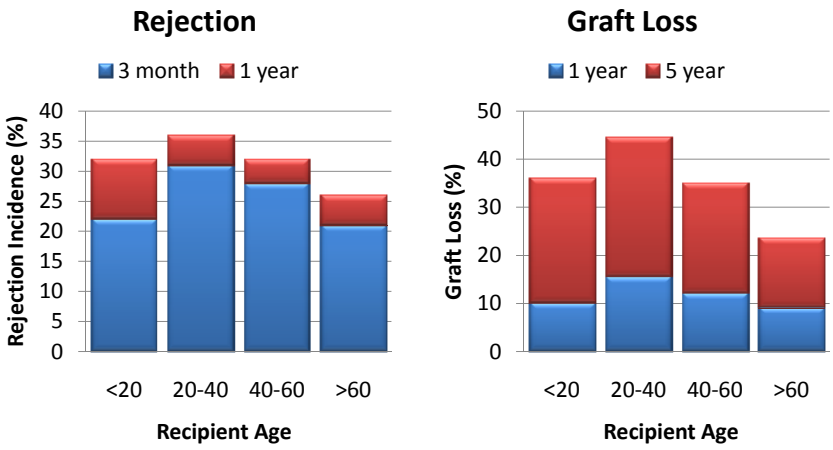


Fig. 13.Recipient Age, Rejection & Graft Loss



Dead Donors Only

Fig. 14. Pretransplant ESRD, Rejection & Graft Loss