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Renal Replacement Therapy

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Annual Dialysis Data Report 2015, JSDT Renal Data Registry

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Abstracts

The annual survey of Japanese Society for Dialysis Therapy Renal Data Registry (JRDR) was conducted for 4380 dialysis facilities at the end of 2015, among which 4321 facilities (98.7%) responded. The response rate of the 2015 survey was comparable with the past, even though it was the first year after the new anonymization method. The number of chronic dialysis patients in Japan continues to increase every year; it has reached 324,986 at the end of 2015. The mean age was 67.86 years. At the end of 2015, the prevalence rate was 2592 patients per million population. Diabetic nephropathy was the most common primary disease among the prevalent dialysis patients (38.4%), followed by chronic glomerulonephritis (29.8%) and nephrosclerosis (9.5%). The rate of diabetic nephropathy and nephrosclerosis has been increasing year by year, whereas that of chronic glomerulonephritis was declining. The number of incident dialysis patients during 2015 was 39,462; it has remained stable since 2008. The average age was 69.20 years, and diabetic nephropathy (43.7%) was the most common cause in the incident dialysis patients. These patients caused by diabetes did not change in number for the last several years. Meanwhile, 31,608 patients died in 2015; the crude mortality rate was 9.6%. The patients treated by hemodiafiltration (HDF) have been increasing rapidly from the revision of medical reimbursement for HDF therapy in 2012. It has attained 53,776 patients at the end of 2015, which were 10,493 greater than that in 2014. In particular, the number of online HDF patients increased about ten times 2012. The number of peritoneal dialysis (PD) patients was 9322 in 2015, which was slightly increased than 2014. Twenty percent of PD patients treated in the combination of hemodialysis (HD) or HDF therapy. Five hundred seventy-two patients underwent home HD therapy at the end of 2015; it increased by 43 from 2014.
Further JRDR data analyses could clarify the relationships between various dialysis modalities, patient care, and clinical outcomes; furthermore, it could also make it possible to establish clinical practice guidelines or medical reimbursement revisions based on the evidence.

Trial registration: JRDR was approved by the ethical committee of JSDT and has been registered in the "University hospital Medical Information Network (UMIN) Clinical Trials Registry" as an approved number of UMIN000018641 since 2015.

Keywords: Elder dialysis patients, Diabetic nephropathy, Ultrapure dialysis fluid, Online hemodiafiltration, Combination of PD and HD

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Part I. JRDR 2015 Annual Data Report; General Remarks

Introduction

Japanese Society for Dialysis Therapy (JSDT) has conducted a survey (JSDT Renal Data Registry: JRDR) on the status of chronic dialysis therapy in Japan at the end of every year since 1968, covering almost all dialysis facilities throughout the country [1, 2]. Despite the fact that this survey is conducted without providing any compensation to participating facilities, its response rate represents a largely complete and unbiased survey of the status of chronic dialysis in Japan, making it quite rare in the world. In publishing our results, we would like to take this opportunity to express our sincere gratitude to everyone at the participating dialysis facilities for taking part in the survey in addition to their routine clinical practice.

JRDR had previously featured two types of reports: prompt (unfixed) data reported at the annual meeting held every June and defined (fixed) data wherein previous data were subsequently screened. The prompt data were distributed at the annual meeting in "An Overview of Regular Dialysis Treatment in Japan, the Illustrated Report". The defined data are presented in "An Overview of Regular Dialysis Treatment in Japan, the CD-ROM Report" and were distributed at the end of the year to all facilities that were JSDT members or participated in the survey. The annual JRDR report, which was published every January in the Journal of Japanese Society for Dialysis (in Japanese), also consists of the defined data. In various cases, the prompt data from the illustrated report were overwhelmingly cited by numbers. The decade of the 2010s has been predicted to include a reduction in the pace of increase in the number of dialysis patients, reaching the point where this number would decrease within a few years [3]. This meant that sometimes defined data would indicate that the rate was still increasing even if it had decreased in the prompt data, which could cause serious confusion. Thus, the use of prompt data for the illustrated reports was discontinued in the 2014 survey, and the illustrated report and CD-ROM were prepared from the defined data instead [4]. The illustrated report is now distributed at the end of the year to each dialysis facility with the CD-ROM included in its back cover.

Table 1 Summary of chronic dialysis therapy in Japan, 2015

Number of facilities		4321 facilities		(Decrease of 9 facilities, 0.2% decrease)			
Equipment	Number of bedside consoles	133,538 units		(Increase of 1983 units, 1.5% increase)			
Capacity	Capacity for simultaneous HD treatments	131,514 treatments		(Increase of 1654 patients, 1.3% increase)			
	Maximum capacity	438,391 patients		(Increase of 5958 patients, 1.4% increase)			
		Outpatients		Inpatients		Total	
Hemodialysis	Hemodialysis (HD)	231,835	(78.5)	26,539	(89.6)	258,374	(79.5)
	Hemodiafiltration (HDF)	52,757	(17.9)	2576	(8.7)	55,333	(17.0)
	Hemofiltration (HF)	11	(0.0)	6	(0.0)	17	(0.0)
	Blood adsorption dialysis	1344	(0.5)	24	(0.1)	1368	(0.4)
	Home hemodialysis	569	(0.2)	3	(0.0)	572	(0.2)
Peritoneal dialysis	PD only	7030	(2.4)	430	(1.5)	7460	(2.3)
	PD + HD 1/week	1541	(0.5)	35	(0.1)	1576	(0.5)
	PD + HD 2/week	177	(0.1)	8	(0.0)	185	(0.1)
	PD + HD 3/week	27	(0.0)	3	(0.0)	30	(0.0)
	PD + HD other frequencies	68	(0.0)	3	(0.0)	71	(0.0)
	Total prevalent dialysis patients	295,359	(100.0)	29,627	(100.0)	324,986	(100.0)
Per million of general population		2592.4 patients (increase of 75.1 patients)					
Prevalent patients receiving dialysis at 5 p.m. or later		33,370 patients					
Incident hemodialysis patients (including HDF)		37,265 patients					
Incident peritoneal dialysis patients		2197 patients					
Incident dialysis patients		39,462 patients (increase of 1135 patients, 3.0% increase)					
Deceased patients		31,068 patients		(Increase of 361 patients, 1.2% increase)			

PD + HD patients: Patients treated by the combination of PD and HD, HDF, hemoadsorption, or hemofiltration (excluding those who underwent only peritoneal lavage)
The above data were obtained from the patient survey

Table 2 Changes in the number of bedside consoles, 1980–2015

	1980/12	1981/12	1982/12	1983/12	1984/12	1985/12	1986/12	1987/12	1988/12	1989/12	1990/12	1991/12	1992/12	1993/12	1994/12	1995/12	1996/12	1997/12
Number of facilities	1278	1314	1425	1442	1514	1587	1745	1845	1962	1726	2101	2385	2520	2629	2752	2866	2961	3026
Number of bedside consoles	18,963	21,032	22,939	24,474	26,558	28,715	30,846	33,527	36,447	34,099	40,723	45,682	49,650	53,262	58,561	59,715	63,742	66,880
	1998/12	1999/12	2000/12	2001/12	2002/12	2003/12	2004/12	2005/12	2006/12	2007/12	2008/12	2009/12	2010/12	2011/12	2012/12	2013/12	2014/12	2015/12
Number of facilities	3085	3220	3358	3485	3612	3717	3882	3940	3985	4052	4081	4133	4166	4213	4238	4268	4330	4321
Number of bedside consoles	69,733	75,448	79,709	83,914	89,070	92,710	97,366	100,552	104,382	108,583	111,998	114,979	118,622	121,863	125,003	128,150	131,555	133,538

The low response rate in 1989 caused a dip in facility or dialysis machine numbers
The above data were obtained from the patient survey

In December 2014, the Ethical Guidelines for Medical and Health Research Involving Human Subjects was issued by the Ministry of Health, Labour, and Welfare and the Ministry of Education, Culture, Sports, Science, and Technology, demanding that all academic societies strictly follow ethical considerations and protect personal information in epidemiological research [5]. Even JSDT changed its survey methods based on these guidelines, starting with enhanced anonymization from its 2015 year-end survey to ensure the protection of personal information. The specific changes made to their survey methods can be found on the members-only pages of the JSDT homepage (http: //www.jsdt.or.jp/). Furthermore, all survey methods were reviewed in March 2015 by the ethics committee (JSDT Ethics Committee Approval No. 1) to uphold ethical validity, fairness, and transparency of surveys. The reviewed survey methods were then entered into the UMIN Clinical Trials Registry (UMIN-CTR) for availability to the public (UMIN000018641), and the review results were batched together for posting on the JSDT homepage. Enhanced anonymization consisted of a system wherein patient information was converted into a random string of alphanumeric characters using a special algorithm, and the correspondence tables for retrieving the real names of patients were held by each dialysis facility; hence, even the JSDT headquarters could not retrieve patient information. The 2015 year-end survey represented the first year of complete anonymization using this system, and although participating facilities were asked to handle more work than usual, the response rate was almost same as in other years. We were reminded of the sincere attitude towards dialysis treatment of all those involved in dialysis treatment in Japan, as well as their trust and expectations towards JSDT.

Survey methods

Sending and collecting questionnaires

The JRDR survey is performed by two types of questionnaires: facility questionnaires that include questions, such as the number of dialysis beds, staff, and

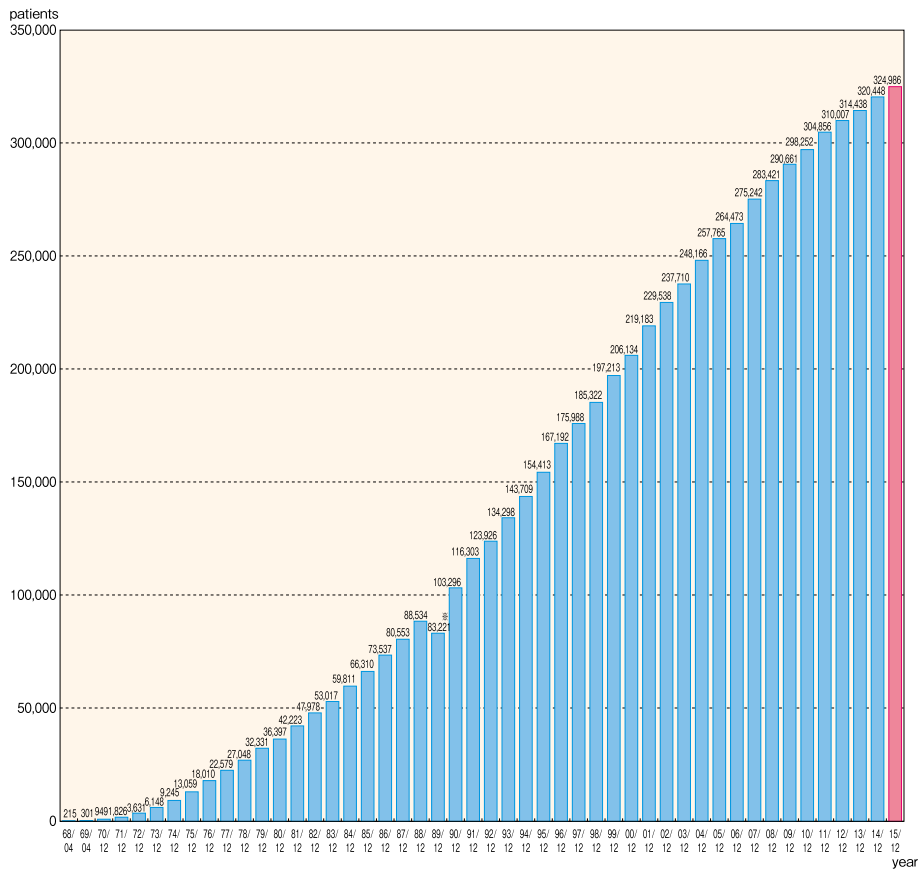

Fig. 1 Changes in the number of prevalent dialysis patients, 1968–2015. The low response rate in 1989 caused a dip in patient numbers

Table 3 Prevalent, incident, and deceased dialysis patient counts and adjusted rates, 1983–2015

	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Prevalent dialysis patients	53,017	59,811	66,310	73,537	80,553	88,534	83,221	103,296	116,303	123,926	134,298	143,709	154,413	167,192	175,988	185,322	197,213
Incident dialysis patients	11,348	12,606	13,416	14,175	14,699	16,470	14,174	18,411	20,877	22,475	23,874	24,296	26,398	28,409	28,870	29,641	31,483
Deceased dialysis patients	4538	5000	5770	6296	6581	7765	6766	8939	9722	11,621	12,143	13,187	14,406	15,174	16,102	16,687	18,524
Adjusted prevalent dialysis patients (pmp)	443.7	497.5	547.8	604.4	658.8	721.1	790.0	835.7	937.6	995.8	1076.4	1149.4	1229.7	1328.4	1394.9	1465.2	1556.7
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	
Prevalent dialysis patients	206,134	219,183	229,538	237,710	248,166	257,765	264,473	275,242	283,421	290,661	298,252	304,856	310,007	314,438	320,448	324,986	
Incident dialysis patients	32,018	33,243	33,710	33,966	35,084	36,063	36,373	36,934	38,180	37,566	37,512	38,613	38,055	38,095	38,327	39,462	
Deceased dialysis patients	18,938	19,850	20,614	21,672	22,715	23,983	24,034	25,253	27,266	27,646	28,882	30,743	30,710	30,751	30,707	31,068	
Adjusted prevalent dialysis patients (pmp)	1624.1	1721.9	1801.2	1862.7	1943.5	2017.6	2069.9	2154.2	2219.6	2279.5	2329.1	2385.4	2431.1	2470.1	2521.6	2557.0	

The above data were obtained from the patient survey

The numbers of dialysis patients were adjusted as per million population (pmp) by the annual government report [7]

patients, and patient questionnaires that include questions, such as dialysis prescriptions, laboratory findings, and outcome indices of individual dialysis patients. In the 2015 year-end JRDR survey, two USBs were mailed to dialysis facilities nationwide in December 2015. One USB contained facility and patient questionnaires prepared in MS Excel, whereas the other USB contained the correspondence tables needed to anonymize patient information and recover real names. The patient questionnaires contained patient information recorded in previous years using the anonymization methods, which were then updated by dialysis facilities to include data on patient survival, death, transfers, and other outcomes. Furthermore, new patients were registered, and the correspondence table USB was used to anonymize the information once all patients were entered. Once anonymized, patient information on questionnaires including their name, sex, and date of birth were converted into a string of alphanumeric characters of random fixed length. Subsequently, each dialysis facility only returned the questionnaire USB to the JSDT administrative offices after confirming that patient personal information was completely anonymized. As described above, anonymization was enhanced with the 2015 JRDR survey, abolishing the paper-based survey methods used before 2014. Paper-based surveys are now only used for certain facilities. The initial deadline was January 31, 2016, but facilities that had not responded were urged to participate, and they were eventually incorporated into the 2015 year-end data with a June 30 deadline.

Survey items

The following items were asked in the 2015 JRDR survey. As described above, the 2015 survey was the first after enhanced anonymization; hence, new topical survey items were not incorporated, and the contents were similar to the 2014 year-end survey. In addition, all survey items before 2014 are included on the member pages of the JSDT homepage (http: //www.jsdt.or.jp/)).

- Facility survey
  1. Overview and scope of facilities
     - Name and contact numbers (TEL, FAX) of facility, as well as the year and month when the facility started providing dialysis treatment
     - Dialysis capabilities: Capacity for simultaneous hemodialysis (HD) treatments,

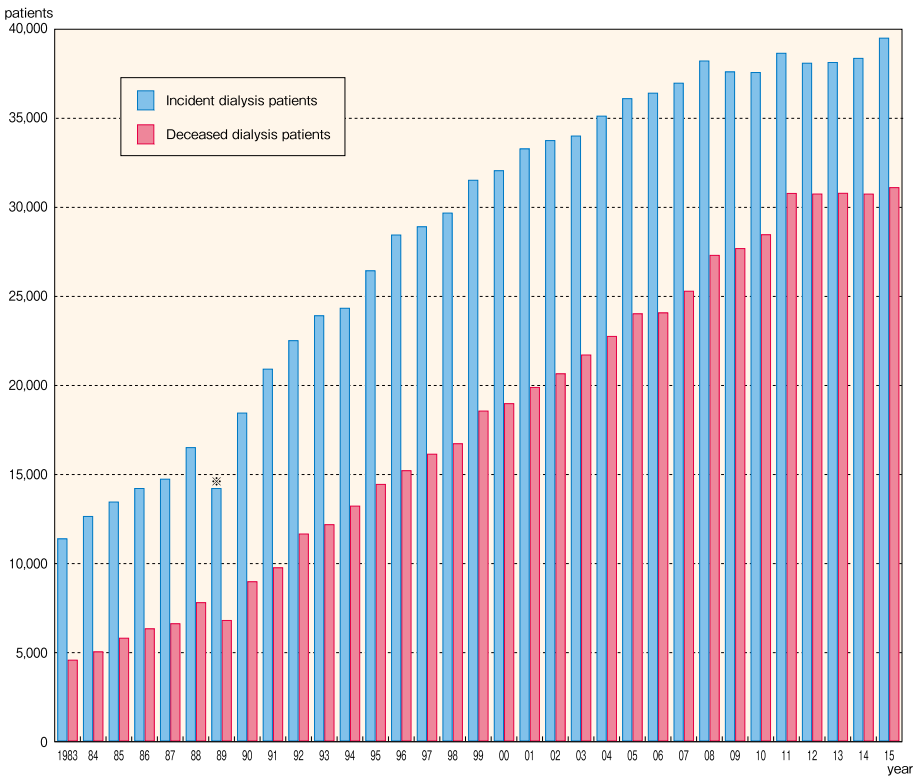

Fig. 2 Incident and deceased dialysis patient counts, 1983–2015

Table 4 Prevalent dialysis patient counts, by modality and prefecture, 2015

Prefecture	Hemodialysis					Peritoneal dialysis					Total	Per million of general population
	Hemodialysis	Hemodiafiltration	Hemofiltration	Blood adsorption filtration	Home hemodialysis	PD only	PD + HD 1/week	PD + HD 2/week	PD + HD 3/week	PD + HD other frequencies		
Hokkaido	11,600	3264	2	78	9	297	79	7	1	1	15,338	2860.0
Aomori	2565	851	0	3	1	62	13	2	0	0	3497	2679.7
Iwate	2720	206	0	17	0	93	9	0	0	0	3045	2388.2
Miyagi	4534	741	0	18	0	96	4	2	0	0	5395	2324.4
Akita	1504	432	0	3	2	57	3	2	0	0	2003	1963.7
Yamagata	1921	592	0	4	11	54	10	4	0	0	2596	2322.0
Fukushima	3648	1054	0	11	1	115	44	11	1	0	4885	2564.3
Ibaraki	6776	1066	1	31	9	76	27	0	0	0	7986	2774.8
Tochigi	5121	837	1	15	1	79	14	1	0	1	6070	3119.2
Gunma	4733	1133	1	6	9	56	10	0	0	0	5948	3073.9
Saitama	13,023	3913	1	68	76	208	84	4	3	2	17,382	2429.0
Chiba	11,230	2879	1	34	8	192	61	5	1	1	14,412	2350.3
Tokyo	23,397	6105	3	152	72	807	242	15	2	10	30,805	2345.3
Kanagawa	16,163	3566	0	72	33	551	66	1	1	1	20,454	2275.4
Niigata	4427	422	0	19	0	126	24	1	2	1	5022	2189.2
Toyama	2092	286	0	18	2	90	15	3	0	0	2506	2373.1
Ishikawa	2234	313	0	23	3	65	8	1	0	0	2647	2313.8
Fukui	1369	330	0	11	3	82	23	4	0	2	1824	2347.5
Yamanashi	1764	424	0	7	1	37	15	0	0	0	2248	2728.2
Nagano	3833	1281	0	4	10	95	23	4	0	1	5251	2531.8
Gifu	4007	684	0	29	26	88	15	4	0	0	4853	2428.9
Shizuoka	8086	2324	1	37	16	119	25	5	2	0	10,615	2911.4
Aichi	15,115	1898	1	100	46	582	81	2	0	1	17,826	2435.2
Mie	3749	318	0	22	5	67	14	1	0	0	4176	2342.1
Shiga	2483	449	0	16	30	117	26	0	0	1	3122	2239.6
Kyoto	5294	788	3	66	12	161	66	4	3	3	6400	2490.3
Osaka	19,483	2969	0	123	30	481	97	12	4	0	23,199	2672.7
Hyogo	10,459	2545	0	75	66	168	44	14	1	2	13,374	2448.1
Nara	2480	720	0	39	5	115	37	2	2	1	3401	2508.1

Table 4 Prevalent dialysis patient counts, by modality and prefecture, 2015 *(Continued)*

Prefecture	Hemodialysis					Peritoneal dialysis					Total	Per million of general population
	Hemodialysis	Hemodiafiltration	Hemofiltration	Blood adsorption filtration	Home hemodialysis	PD only	PD + HD 1/week	PD + HD 2/week	PD + HD 3/week	PD + HD other frequencies		
Wakayama	2631	278	0	28	19	38	7	1	0	1	3003	3131.4
Tottori	1086	351	0	3	1	45	11	3	1	0	1501	2633.3
Shimane	881	665	0	0	1	47	6	4	0	0	1604	2328.0
Okayama	3731	969	0	28	5	171	15	1	0	0	4920	2584.0
Hiroshima	5424	1752	1	33	28	242	64	52	0	3	7599	2704.3
Yamaguchi	2453	931	0	7	0	91	34	1	1	0	3518	2523.7
Tokushima	1999	623	0	2	4	125	31	0	0	8	2792	3712.8
Kagawa	1917	563	0	13	8	147	47	2	0	0	2697	2783.3
Ehime	2504	1219	0	10	0	106	27	0	0	14	3880	2817.7
Kochi	1539	750	0	6	0	13	3	0	0	0	2311	3187.6
Fukuoka	12,461	1428	0	55	7	677	29	1	0	3	14,661	2900.3
Saga	2088	263	0	6	1	12	3	1	0	0	2374	2863.7
Nagasaki	3483	370	0	9	5	119	16	2	2	0	4006	2924.1
Kumamoto	5740	517	0	25	1	133	22	0	0	4	6442	3623.2
Oita	3379	368	0	6	2	121	38	4	0	0	3918	3383.4
Miyazaki	3290	235	0	5	0	39	1	0	0	2	3572	3247.3
Kagoshima	4683	647	1	20	1	111	29	2	1	4	5499	3349.0
Okinawa	3275	1014	0	11	2	87	14	0	2	4	4409	3098.4
Total	258,374	55,333	17	1368	572	7460	1576	185	30	71	324,986	2557.0
%	(79.5)	(17.0)	(0.0)	(0.4)	(0.2)	(2.3)	(0.5)	(0.1)	(0.0)	(0.0)	(100.0)	

The above data were obtained from the patient survey

The numbers of dialysis patients were adjusted as per million population (pmp) by the annual government report [7]

maximum capacity for HD treatments, and number of bedside consoles
- Number of workers involved in dialysis treatment (e.g., doctors, nurses, clinical engineers, nutritionists, case workers)
- Number of medical dialysis specialists qualified by JSDT

2. Patient dynamics
- Number of prevalent dialysis patients at the end of 2015 (number of patients by treatment modality, inpatient/outpatient)
- Number of dialysis patients undergoing nighttime dialysis in 2015
- Number of incident dialysis patients in 2015 (number of incident HDF and peritoneal dialysis (PD) patients)
- Number of deceased patients during 2015

3. Dialysis fluid quality control
- Use of endotoxin retentive filter (ETRF)
- Dialysis fluid sampling status and sampling site of dialysis fluid during testing
- Frequency for measuring endotoxin (ET) concentration in dialysis fluid and ET concentration in dialysis fluid
- Frequency for measuring total viable microbial count (TVC) in dialysis fluid, sampling volume for TVC, cultivation medium for TVC, and TVC in dialysis fluid

- Patient survey

1. Patient personal information
- Sex, date of birth, year and month of start of dialysis, year and month of transfer from another hospital, primary disease, residence (prefecture), dialysis modality, month of transfer (destination facility code), outcome category, outcome date (transfer, death, dropout, or transplantation) (destination facility code), month of death, cause of death, dates of changes, change codes, status of combined therapies involving PD with HD or hemodiafiltration (HDF), etc., PD experience, and number of kidney transplants

2. HD/HDF therapy conditions
- Frequency of dialysis session per week, dialysis time per session, and blood flow rate
- HDF: dilution methods, substitution fluid volume per session
- Body height, pre- and post-dialysis body weight, pre-dialysis systolic blood pressure, pre-dialysis diastolic blood pressure, and pre-dialysis pulse rate

3. Laboratory findings
- Pre- and post-dialysis serum urea nitrogen (UN), pre- and post-dialysis serum creatinine concentration, pre-dialysis serum albumin concentration, pre-dialysis serum C-reactive protein (CRP) concentration, pre-dialysis serum calcium concentration, pre-dialysis serum phosphorus concentration, serum parathyroid hormone (PTH) assay method, PTH level (intact or whole PTH), pre-dialysis hemoglobin concentration, serum total cholesterol concentration (total cholesterol), and serum high-density lipoprotein cholesterol concentration (HDL-C)

4. Outcome factors
- Antihypertensive drug use, smoking, history of diabetes, history of myocardial infarction, history of cerebral hemorrhage,

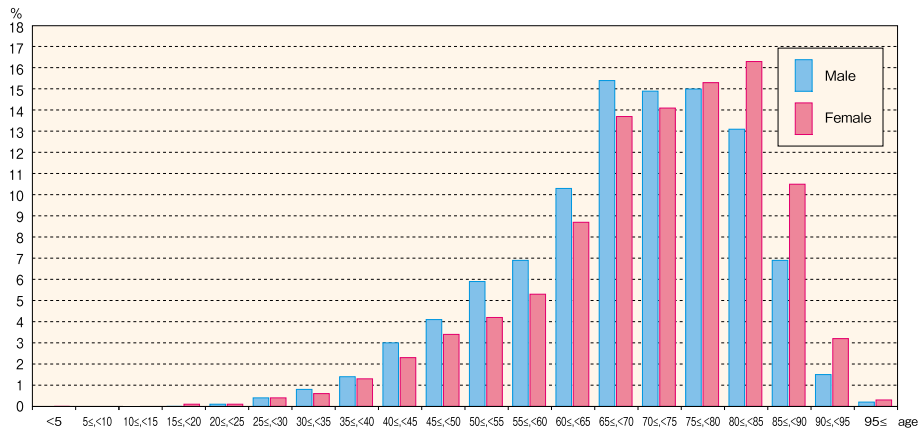

Fig. 3 Incident dialysis patient distribution, by age and sex, 2015

Table 5 Incident dialysis patient distribution, by age and sex, 2015

Age at dialysis initiation	Male	Female	Subtotal	No information available	Total
< 5	6	4	10		10
(%)	(0.0)	(0.0)	(0.0)		(0.0)
5 ≤, < 10	3	2	5		5
(%)	(0.0)	(0.0)	(0.0)		(0.0)
10 ≤, < 15	4	3	7		7
(%)	(0.0)	(0.0)	(0.0)		(0.0)
15 ≤, < 20	12	13	25		25
(%)	(0.0)	(0.1)	(0.1)		(0.1)
20 ≤, < 25	36	15	51		51
(%)	(0.1)	(0.1)	(0.1)		(0.1)
25 ≤, < 30	94	42	136		136
(%)	(0.4)	(0.4)	(0.4)		(0.4)
30 ≤, < 35	199	70	269		269
(%)	(0.8)	(0.6)	(0.7)		(0.7)
35 ≤, < 40	360	159	519		519
(%)	(1.4)	(1.3)	(1.4)		(1.4)
40 ≤, < 45	752	273	1025		1025
(%)	(3.0)	(2.3)	(2.8)		(2.8)
45 ≤, < 50	1025	404	1429		1429
(%)	(4.1)	(3.4)	(3.9)		(3.9)
50 ≤, < 55	1486	494	1980		1980
(%)	(5.9)	(4.2)	(5.4)		(5.4)
55 ≤, < 60	1735	621	2356		2356
(%)	(6.9)	(5.3)	(6.4)		(6.4)
60 ≤, < 65	2571	1020	3591		3591
(%)	(10.3)	(8.7)	(9.8)		(9.8)
65 ≤, < 70	3846	1610	5456		5456
(%)	(15.4)	(13.7)	(14.8)		(14.8)
70 ≤, < 75	3718	1663	5381		5381
(%)	(14.9)	(14.1)	(14.6)		(14.6)
75 ≤, < 80	3750	1808	5558		5558
(%)	(15.0)	(15.3)	(15.1)		(15.1)
80 ≤, < 85	3266	1923	5189		5189
(%)	(13.1)	(16.3)	(14.1)		(14.1)
85 ≤, < 90	1714	1243	2957		2957
(%)	(6.9)	(10.5)	(8.0)		(8.0)
90 ≤, < 95	381	381	762		762
(%)	(1.5)	(3.2)	(2.1)		(2.1)
95 ≤	46	40	86		86
(%)	(0.2)	(0.3)	(0.2)		(0.2)
Subtotal	25,004	11,788	36,792		36,792
(%)	(100.0)	(100.0)	(100.0)		(100.0)
Unknown	3	2	5		5
No information available					
Total	25,007	11,790	36,797		36,797
Mean age	68.37	70.95	69.20		69.20
S.D.	13.26	13.48	13.39		13.39

Values in parentheses on the right side of each figure represent the percentage relative to the subtotal in each column
The above data were obtained from the patient survey

history of cerebral infarction, limb amputation, history of proximal femur fracture, history of encapsulating peritoneal sclerosis (EPS)

5. Peritoneal dialysis (PD) survey
   - Therapeutic history: Current PD dialysis vintage, number of months in which PD was performed in 2015
   - Peritoneal function: Implementation of peritoneal equilibration test (PET), 4-h creatinine concentration dialysate/plasma ratio in PET (PET Cr D/P ratio)
   - Dialysis prescription: Type of PD fluid, volume of PD fluid per day, PD treatment time per day, daily urine volume, mean fluid removal volume per day, *Kt/V* by residual kidney function (residual kidney *Kt/V*), *Kt/V* by PD (PD *Kt/V*)
   - Dialysis method: Use of automated peritoneal dialysis (APD) machine, changing maneuver of PD fluid
   - Infectious disease: Numbers of peritonitis during 2015 (peritonitis frequency), numbers of exit-site infections during 2015

Methods for publicizing survey results and overview of this report

As described in the introduction, JRDR survey results could be reported by preparing an illustrated report and an annual report based on the defined data from the 2014 survey. The annual report was posted every January in the Journal of Japanese Society for Dialysis (in Japanese), and a translated version was posted approximately 6 months later in the Therapeutic Apheresis and Dialysis (TAD). In copies of the TAD, survey results were mostly reported in

tables due to page limitations, and the illustrated report provides graphic explanations. The JSDT website makes downloading PDFs of TAD papers and the illustrated reports possible and, furthermore, MS-PowerPoint presentations with illustrations [6], but it was the illustrated reports that overwhelmingly receive the most use in general. In contrast, several foreign countries have been demanding that the results of the JRDR survey be published in a form that people around the world may easily use. In the 2016 business plan, the JRDR Committee proceeded with preparations to make PDFs of English language versions of the annual report, English translations of MS-PowerPoint presentations, and MS Excel files with tables in English available on the JSDT website to let the rest of the world know the state of dialysis therapy in Japan and the expertise available. When this was done, the posting destination was changed from the TAD to the journal Renal Replacement Therapy (RRT), which joined a new English language JSDT journal (now preparing the 2014 year-end survey report). In changing the publication methods for survey results, the form of illustrated, Japanese language, and English language reports had to be streamlined as much as possible to simplify the effort required to prepare reports in Japanese and translate them into English. This report was published by this process, and although it was written, based on tables and drawings used in the illustrated report, the issue of how to maintain uniformity in areas such as the order of recording is still being sorted out. Hence, there might still be some inconvenience for readers, and thus, we apologize. We report the survey results and discussion in "JRDR Annual Data Report (ADR) 2015" in the Part II as described below.

Contents of JRDR 2015 ADR

Chapter 1: Basic demographics

1. Facility dynamics
2. Number of dialysis patients
3. Distribution of dialysis patients by treatment modality and prefecture
4. Mean age, sex, and dialysis vintage
5. Primary diseases
6. Causes of death
7. Crude death rate and survival rate

Chapter 2: Current status of dialysis fluid quality management

1. Overview of dialysis fluid quality
2. Dialysis fluid ET testing
3. Dialysis fluid viable microbial testing
4. Present status of ETRF installation
5. Overall dialysis fluid quality

Chapter 3: Current status of hemodiafiltration (HDF)

1. HDF patient dynamics
2. Types and annual changes of HDF treatment modality
3. HDF prescriptions
4. Urea kinetics, nutrition, and inflammation in HDF patients
5. Management for anemia and CKD-MBD in HDF patients

Chapter 4: Current status of peritoneal dialysis (PD)

1. PD patient dynamics
2. Present status of PD + HDF combined therapy

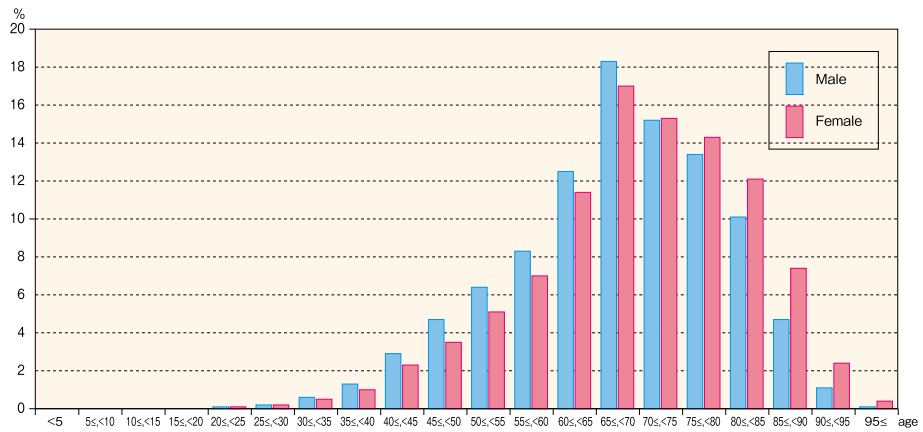

Fig. 4 Prevalent dialysis patient distribution, by age and sex, 2015

Table 6 Prevalent dialysis patient distribution, by age and sex, 2015

Age at the end of 2015	Male	Female	Subtotal	No information available	Total
< 5	14	23	37		37
(%)	(0.0)	(0.0)	(0.0)		(0.0)
5 ≤, < 10	15	13	28		28
(%)	(0.0)	(0.0)	(0.0)		(0.0)
10 ≤, < 15	24	14	38		38
(%)	(0.0)	(0.0)	(0.0)		(0.0)
15 ≤, < 20	61	43	104		104
(%)	(0.0)	(0.0)	(0.0)		(0.0)
20 ≤, < 25	125	87	212		212
(%)	(0.1)	(0.1)	(0.1)		(0.1)
25 ≤, < 30	454	200	654		654
(%)	(0.2)	(0.2)	(0.2)		(0.2)
30 ≤, < 35	1110	551	1661		1661
(%)	(0.6)	(0.5)	(0.5)		(0.5)
35 ≤, < 40	2631	1167	3798		3798
(%)	(1.3)	(1.0)	(1.2)		(1.2)
40 ≤, < 45	5844	2553	8397		8397
(%)	(2.9)	(2.3)	(2.7)		(2.7)
45 ≤, < 50	9386	3891	13,277		13,277
(%)	(4.7)	(3.5)	(4.2)		(4.2)
50 ≤, < 55	12,900	5654	18,554		18,554
(%)	(6.4)	(5.1)	(5.9)		(5.9)
55 ≤, < 60	16,695	7815	24,510		24,510
(%)	(8.3)	(7.0)	(7.8)		(7.8)
60 ≤, < 65	25,166	12,759	37,925		37,925
(%)	(12.5)	(11.4)	(12.1)		(12.1)
65 ≤, < 70	36,926	19,055	55,981		55,981
(%)	(18.3)	(17.0)	(17.9)		(17.9)
70 ≤, < 75	30,637	17,091	47,728		47,728
(%)	(15.2)	(15.3)	(15.2)		(15.2)
75 ≤, < 80	27,064	15,968	43,032		43,032
(%)	(13.4)	(14.3)	(13.7)		(13.7)
80 ≤, < 85	20,321	13,582	33,903		33,903
(%)	(10.1)	(12.1)	(10.8)		(10.8)
85 ≤, < 90	9496	8317	17,813		17,813
(%)	(4.7)	(7.4)	(5.7)		(5.7)
90 ≤, < 95	2193	2695	4888		4888
(%)	(1.1)	(2.4)	(1.6)		(1.6)
95 ≤	272	400	672		672
(%)	(0.1)	(0.4)	(0.2)		(0.2)
Subtotal	201,334	111,878	313,212		313,212
(%)	(100.0)	(100.0)	(100.0)		(100.0)
Unspecified	2	2	4		4
No information available	1		1		1
Total	201,337	111,880	313,217		313,217
Mean	67.07	69.28	67.86		67.86
S.D.	12.37	12.58	12.49		12.49

The above data were obtained from the patient survey

3. PD prescriptions
4. Residual kidney function (urine volume and residual kidney Kt/V)
5. Peritoneal function (ultrafiltration volume and PD Kt/V)
6. Peritoneal equilibration test (PET) and dialysate/plasma creatinine (D/P Cr) ratio
7. Exit-site infection (ESI) and peritonitis
8. History of encapsulating peritoneal sclerosis (EPS)

Chapter 5: Current status of elderly dialysis patients

1. Present status of elderly dialysis patients
2. Hemodynamics, dialysis prescriptions and urea kinetics in elderly dialysis patients
3. Nutrition and inflammation in elderly dialysis patients
4. Management for anemia and CKD-MBD in elderly dialysis patients

Chapter 6: Current status of diabetic dialysis patients

1. Present status of diabetic dialysis patients
2. Hemodynamics, dialysis prescriptions, and urea kinetics in diabetic dialysis patients
3. Nutrition and inflammation in diabetic dialysis patients
4. Management for anemia and CKD-MBD in diabetic dialysis patients
5. Annual changes in diabetic dialysis patients dynamics

Part II. JRDR 2015 Annual Data Report: results and discussion

Chapter 1: Basic demographics

Facility dynamics

The 2015 JRDR survey was conducted at 4380 facilities nationwide, and the 4321 facilities has responded. The number of responding facilities had

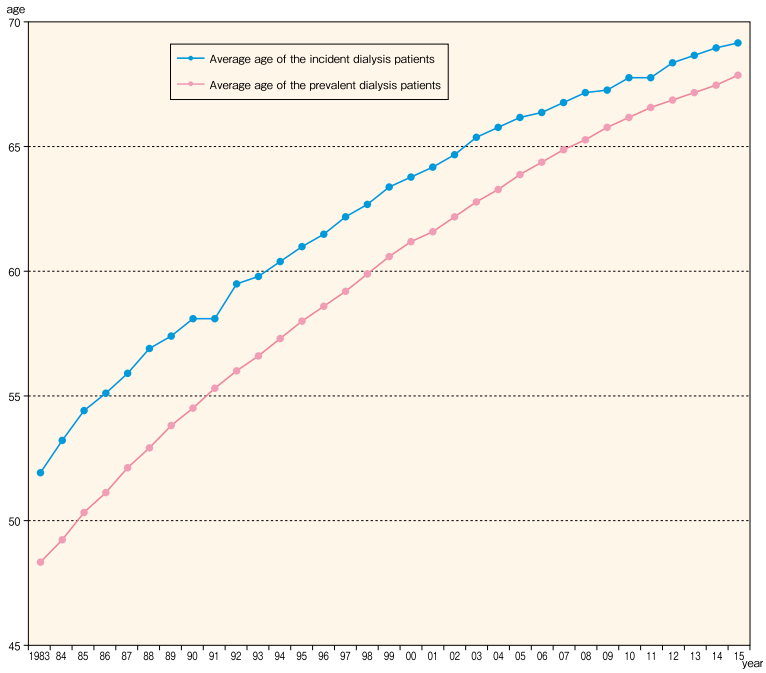

Fig. 5 Average age of incident and prevalent dialysis patients, 1983–2015

been increasing over the past 10 years, but a nine-center reduction (0.2 point reduction) from the previous year was observed in the 2015 survey. There was a concern that the enhanced anonymization and the abolition of paper-based survey had resulted in a decreased response rate and an undervaluation of dialysis facility and patient counts. However, the response rate for facility survey was 98.7%, whereas the facility response rate for patient survey was 94.6% of the total; thus, there was hardly any change from the previous year. Thus, a decrease in the number of facilities responding to questionnaires does not necessarily mean a substantial decrease in the number of dialysis facilities. However, recently, the slowing rate of increase in dialysis patients was observed, and thus, future trends have become a matter of attention (Tables 1 and 2). The 4321 facilities had 133,538 bedside consoles (a 1983 increase from the previous year), a simultaneous HD treatment capacity of 131,514, and a maximum capacity for HD treatments of 438,391. Compared with the end of 2014, these represented increases of 1.5, 1.3, and 1.4%, respectively (Table 2).

Number of dialysis patients

Based on the facility survey, the total number of patients receiving chronic dialysis therapy at the end of

Table 7 Mean age of incident and prevalent dialysis patients, 1983–2015

	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Mean age of the incident dialysis patients	51.9	53.2	54.4	55.1	55.9	56.9	57.4	58.1	58.1	59.5	59.8	60.4	61.0	61.5	62.2	62.7	63.4
Mean age of the prevalent dialysis patients	48.3	49.2	50.3	51.1	52.1	52.9	53.8	54.5	55.3	56.0	56.6	57.3	58.0	58.6	59.2	59.9	60.6
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	
Mean age of the incident dialysis patients	63.8	64.2	64.7	65.4	65.8	66.2	66.4	66.8	67.2	67.3	67.8	67.8	68.4	68.7	69.0	69.2	
Mean age of the prevalent dialysis patients	61.2	61.6	62.2	62.8	63.3	63.9	64.4	64.9	65.3	65.8	66.2	66.6	66.9	67.2	67.5	67.9	

The above data were obtained from the patient survey

2015 was 324,986, which represents the prevalence of chronic kidney disease patients undergoing dialysis therapy. The number of dialysis patients increased by approximately 10,000 people annually through 2005, but this rate has been slowing in recent years. At the end of 2014, the number had increased by 6010 from the previous year, and at the end of 2015, it had increased by 4538 people (Fig. 1, Table 3). (In the figure, the decrease in the number of patients at the end of 1989 is apparently the effect of the exceptionally low 86% questionnaire response rate that year [2]).

In 2012, Nakai et al. [3] predicted the number of future dialysis patients, stating that the number would decrease from a peak of approximately 348,000 in 2021. The number of dialysis patients per million of the population (pmp) would be 2592.4 persons, an increase of 75.1 people from the previous year, meaning there would be one dialysis patient for every 385.7 Japanese citizens (Table 3) [7]. The population of Japan has been on the decline since 2011; thus, the percentage of the population has increased year by year. Incidentally, the highest number of dialysis patients pmp in the world is in Taiwan, with Japan following a close second [8]. In contrast, the number of incident dialysis patients represents the incidence of chronic kidney disease patients undergoing dialysis therapy, and although the number of incident dialysis patients before 2008 showed an increasing trend, it began to exhibit a decrease in 2009. Since then, faint fluctuations in the number of patients have been observed, but the rate has remained largely constant. However, the number of incident dialysis patients in 2015 increased 1135 persons from the previous year to 39,462, exceeding 39,000 persons for the first time (Fig. 2, Table 3). In contrast, the annual number of deceased patients has consistently increased through 2011. However, since then the rate has remained mostly constant. The number of deceased 2015 prevalent patients increased to 31,068, an increase of 361 persons from 2014, exceeding 31,000 persons for the first time (Fig. 2, Table 3).

Distribution of dialysis patients by treatment modality and prefecture

Tabulation in the 2015 JRDR survey was switched to a method focusing upon treatment modality, such as HDF, which showed a rapid increase in use recently. The percentages held by each therapeutic method are 79.5% for HD, 17.0% for HDF, 0.0% for hemofiltration (HF), 0.4% for hemoadsorption dialysis, 2.9% for PD, and 0.2% for home hemodialysis (HHD) (Table 1). The percentage of total home dialysis therapy in Japan including PD and HHD was 3.1%, which was the lowest in the developed world [8]. HDF therapy, particularly online HDF, had dramatically increased in use since the 2012 revision of the medical payment system, and the total number of patients using HDF at the end of 2015 was 55,333 persons. A total of 9322 patients were treated by PD, which represented

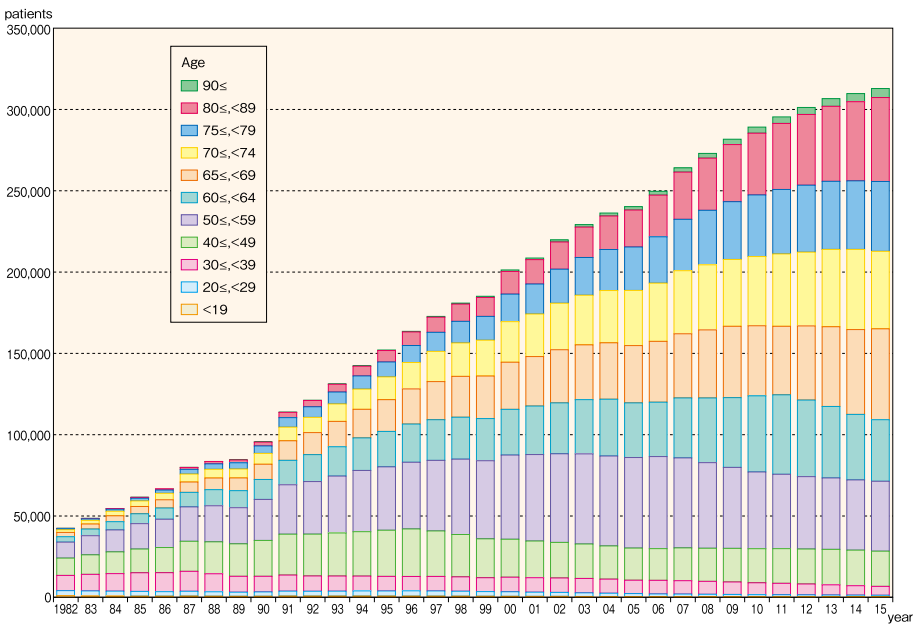

Fig. 6 Prevalent dialysis patient distribution, by age, 1982–2015

Table 8 Prevalent dialysis patient distribution, by age, 1982–2015

Age	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
< 20	849	683	628	527	517	587	505	438	470	606	580	576	596	579	555	546	516
20≤, < 30	3050	3060	2972	2900	2758	2927	2703	2512	2656	2985	2947	3001	3153	3125	3240	3177	3028
30≤, < 40	9378	10,191	10,790	11,490	11,695	12,285	11,089	9782	9611	9913	9426	9340	9123	8984	8842	8934	8857
40≤, < 50	10,668	12,030	13,399	14,609	15,493	18,495	19,671	20,011	22,088	25,169	25,751	26,510	27,355	28,420	29,267	28,019	26,087
50≤, < 60	9835	11,783	13,512	15,648	17,418	21,196	22,221	22,254	25,259	30,444	32,392	35,043	37,711	39,047	41,068	43,463	46,401
60≤, < 65	3346	4101	5086	6094	6931	8943	9922	10,496	12,296	15,045	16,596	18,069	20,056	21,817	23,550	25,052	25,838
65≤, < 70	2633	3107	3628	4469	5066	6382	7177	7837	9388	12,060	13,566	15,612	17,600	19,572	21,635	23,484	25,160
70≤, < 75	1657	2232	2788	3437	3975	4899	5339	5497	6669	8370	9371	10,756	12,450	14,016	16,277	18,597	20,607
75≤, < 80	668	955	1258	1662	2021	2896	3377	3853	4608	5891	6550	7350	8126	9200	10,471	11,738	13,282
80≤, < 90	180	256	369	541	725	1179	1430	1730	2384	3252	3872	4787	6003	7052	8366	9344	10,650
90≤	2	4	10	12	14	43	52	62	68	92	124	181	219	313	354	473	599
Age	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
< 20	473	417	388	389	308	274	253	227	232	215	215	179	183	215	210	226	207
20≤, < 30	2846	2809	2572	2427	2246	2039	1842	1653	1571	1454	1346	1260	1221	1119	1027	928	866
30≤, < 40	8541	8953	8910	8896	8860	8681	8228	8371	8235	7960	7687	7312	7009	6674	6251	5789	5459
40≤, < 50	23,958	23,371	22,601	21,895	21,227	20,454	19,798	19,530	20,203	20,385	20,690	20,999	21,360	21,534	21,837	21,901	21,674
50≤, < 60	48,113	51,868	53,261	54,600	55,504	55,390	55,779	56,711	55,424	52,730	49,874	47,261	45,802	44,593	43,933	43,263	43,064
60≤, < 65	25,965	28,155	29,890	31,358	33,417	34,975	33,666	33,492	36,939	39,849	42,982	46,894	48,955	47,162	44,032	40,352	37,925
65≤, < 70	26,208	29,022	30,473	32,733	33,747	34,759	35,290	37,469	39,521	41,922	43,932	43,160	42,203	45,664	49,118	52,259	55,981
70≤, < 75	22,066	25,001	26,212	28,638	30,564	32,198	33,966	35,862	38,861	40,096	41,173	42,638	44,581	45,430	47,622	49,367	47,728
75≤, < 80	14,657	16,953	18,466	20,961	23,248	25,272	26,767	28,552	31,638	33,565	35,605	37,951	39,700	41,255	41,937	42,251	43,032
80≤, < 90	11,679	13,978	15,034	16,785	18,714	20,639	22,765	25,663	29,090	32,133	35,174	38,028	40,681	43,578	46,210	48,746	51,716
90≤	724	933	984	1284	1550	1824	2100	2363	2636	2924	3301	3762	4036	4314	4736	5005	5560

The above data were obtained from the patient survey

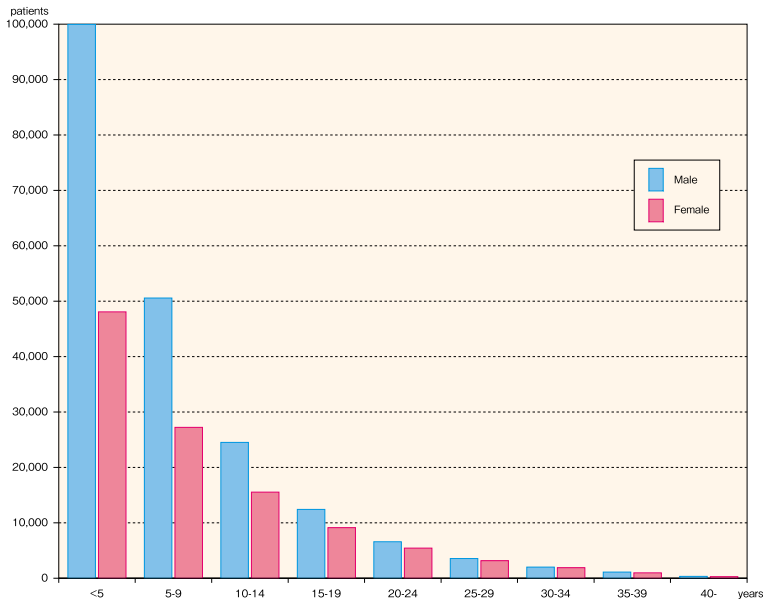

Fig. 7 Prevalent dialysis patient distribution, by sex and dialysis vintage, 2015

Table 9 Prevalent dialysis patient distribution, by sex and dialysis vintage, 2015

Dialysis vintage (years)	Male	Female	Subtotal	No information available	Total
< 5	99,944	48,073	148,017		148,017
(%)	(49.7)	(43.0)	(47.3)		(47.3)
5 ≤, < 10	50,569	27,232	77,801		77,801
(%)	(25.1)	(24.4)	(24.9)		(24.9)
10 ≤, < 15	24,517	15,543	40,060		40,060
(%)	(12.2)	(13.9)	(12.8)		(12.8)
15 ≤, < 20	12,426	9129	21,555		21,555
(%)	(6.2)	(8.2)	(6.9)		(6.9)
20 ≤, < 25	6591	5440	12,031		12,031
(%)	(3.3)	(4.9)	(3.8)		(3.8)
25 ≤, < 30	3560	3170	6730		6730
(%)	(1.8)	(2.8)	(2.2)		(2.2)
30 ≤, < 35	2014	1903	3917		3917
(%)	(1.0)	(1.7)	(1.3)		(1.3)
35 ≤, < 40	1116	980	2096		2096
(%)	(0.6)	(0.9)	(0.7)		(0.7)
40 ≤	341	276	617		617
(%)	(0.2)	(0.2)	(0.2)		(0.2)
Subtotal	201,078	111,746	312,824		312,824
(%)	(100.0)	(100.0)	(100.0)		(100.0)
Unspecified	258	134	392		392
No information available	1		1		1
Total	201,337	111,880	313,217		313,217
Mean	6.81	8.22	7.31		7.31
S.D.	7.16	8.14	7.55		7.55

The above data were obtained from the patient survey

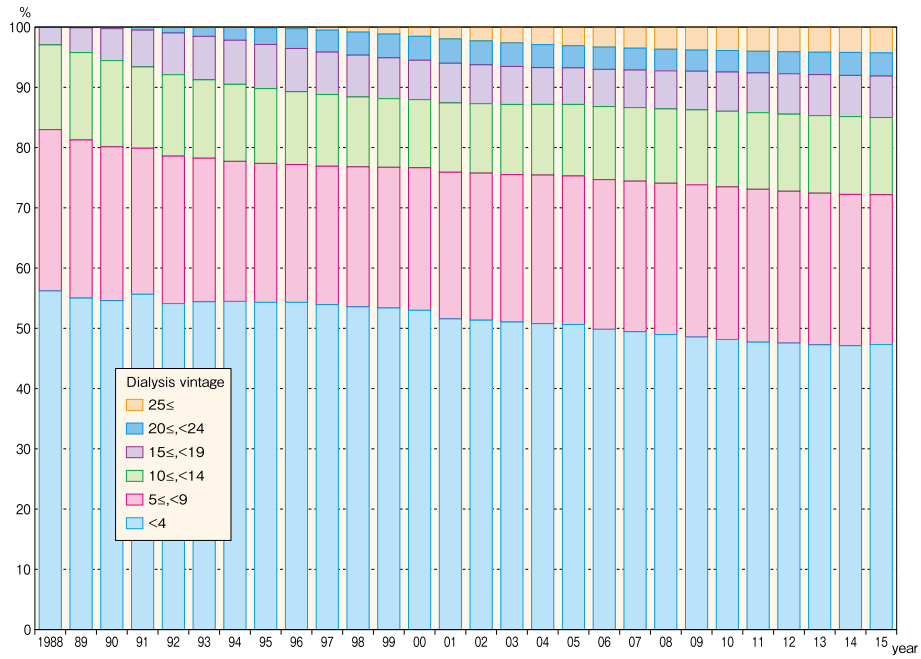

Fig. 8 Prevalent dialysis patient distribution, by dialysis vintage, 1988–2015

a slight increase from 9255 in 2014. Twenty percent of all PD patients were on the combination therapy with HDF, a percentage which has remained largely constant for the past 5 years. A total of 572 patients were on HHD, which was a 43-person increase from 2014. This represented a large rate of increase, but the percentage of all therapies was still small. Thirty-three thousand three hundred seventy patients were treated in nighttime dialysis at the end of 2015, which represented a decrease from 41,271 persons in 2014. The number of nighttime dialysis patients was approximately 41,000 to 42,000 persons for several years. However, it is possible that either it actually decreased in 2015 or changes in how the number of

Table 10 Prevalent dialysis patient distribution, by dialysis vintage, 1988–2015

Dialysis vintage (years)	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
< 5	47,087	46,617	52,327	63,584	65,835	71,547	77,690	82,757	89,049	93,402	97,230	99,120	106,993	107,803
5 ≤, < 10	22,423	22,238	24,472	27,709	29,775	31,340	33,162	35,145	37,524	39,781	42,163	43,365	47,792	50,888
10 ≤, < 15	11,783	12,285	13,704	15,418	16,438	17,102	18,228	18,934	19,820	20,604	21,052	21,150	22,826	24,050
15 ≤, < 20	2441	3485	5089	6974	8429	9479	10,436	11,142	11,755	12,193	12,600	12,594	13,199	13,765
20 ≤, < 25	28	95	242	566	1170	2001	3035	4202	5364	6308	6952	7342	8024	8450
25 ≤	0	0	0	2	8	23	75	193	448	874	1485	2114	3076	4080
Dialysis vintage (years)	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
< 5	113,075	117,116	120,159	121,803	124,576	130,708	133,827	136,934	139,371	141,076	143,360	145,064	146,085	148,017
5 ≤, < 10	53,766	56,169	58,357	59,295	62,117	66,076	68,617	71,251	73,320	75,073	75,991	77,197	77,862	77,801
10 ≤, < 15	25,376	26,710	27,738	28,550	30,318	32,270	33,696	35,074	36,338	37,588	38,547	39,490	40,032	40,060
15 ≤, < 20	14,206	14,463	14,453	14,605	15,419	16,472	17,265	18,111	18,852	19,534	20,238	20,874	21,213	21,555
20 ≤, < 25	8765	8992	9034	8838	9252	9603	9815	9876	10,335	10,629	11,015	11,421	11,802	12,031
25 ≤	5008	5996	6865	7422	8275	9227	10,017	10,750	11,233	11,835	12,307	12,766	13,028	13,360

The above data were obtained from the patient survey

nighttime dialysis patients are entered in the 2015 survey, and furthermore, the addition of "Dialysis for a given period of time recognized by insurance as starting after 5:00 p.m. or ending after 9:00 p.m." as the definition of nighttime dialysis in annotated response fields had an influence; thus, future trends require attentive observation. The total number of incident dialysis patients was 39,462 persons, of whom 94.4% began HDF or similar therapies, and 5.6% began PD. Changes in how incident HDF as well as incident PD cases were entered may have influenced the tabulated values.

Before 2014, the number of chronic dialysis patients by prefecture was presented categorized into daytime dialysis, nighttime dialysis, HHD, and PD, but the tabulation method was changed to details on the treatment modality from the 2015 JRDR survey. The number of dialysis patients in prefectures is governed by fundamental population differences, and those differences remain large on the order of the patient number in pmp. The mean in Japan is 2592.4 pmp, but greatly differs depending on the region from 1963.7 pmp (Akita Prefecture) to 3712.8 pmp (Tokushima Prefecture). Similarly, regional differences in the percentages of each treatment modality were found, and the percentage of HDF representing all dialysis patients has a nationwide mean of 17.0%, although major differences ranging from 6.6% (Miyazaki Prefecture) to 41.5% (Shimane Prefecture) were found. The percentage of PD patients also similarly has a nationwide mean of 2.9%, but major differences ranging from 0.7% (Saga Prefecture) to 7.3% (Kagawa Prefecture) (Table 4) were found.

Table 11 Incident dialysis patient distribution, by primary disease, 2015

Primary disease	Total	Mean age	S.D.
Chronic glomerulonephritis (%)	6232 (16.9)	68.77	14.37
Chronic pyelonephritis (%)	256 (0.7)	67.56	15.69
RPGN (%)	463 (1.3)	73.12	12.13
PIH (%)	30 (0.1)	62.60	13.63
Unclassified nephritis (%)	141 (0.4)	67.42	16.08
PKD (%)	939 (2.6)	62.50	13.69
Nephrosclerosis (%)	5225 (14.2)	75.33	11.31
Hypertensive emergencies (%)	296 (0.8)	63.61	17.74
Diabetes (%)	16,072 (43.7)	67.29	12.21
Lupus nephritis (%)	269 (0.7)	63.76	14.35
Amyloidosis (%)	112 (0.3)	69.72	10.61
Gout (%)	83 (0.2)	62.70	14.38
Inborn errors of metabolism (%)	19 (0.1)	48.37	23.20
Tuberculosis (%)	9 (0.0)	81.00	8.49
Urolithiasis (%)	76 (0.2)	71.75	12.14
Neoplasm of kidney and urinary tract (%)	177 (0.5)	72.74	10.38
Urinary tract obstruction (%)	104 (0.3)	68.98	13.56
Myeloma (%)	142 (0.4)	71.73	9.87
Hypoplastic kidney (%)	51 (0.1)	45.47	26.79
Undetermined (%)	4473 (12.2)	72.04	13.38
Rejected kidney (%)	216 (0.6)	55.67	15.07
Others (%)	1411 (3.8)	69.68	14.96
Subtotal (%)	36,796 (100.0)	69.20	13.39
No information available	1	74.00	
Total	36,797	69.20	13.39

The above data were obtained from the patient survey

Table 12 Prevalent dialysis patient distribution, by primary disease, 2015

Primary disease	Total	Mean age	S.D.
Chronic glomerulonephritis (%)	93,347 (29.8)	66.90	12.46
Chronic pyelonephritis (%)	2935 (0.9)	65.62	13.84
RPGN (%)	2478 (0.8)	69.23	12.93
PIH (%)	1545 (0.5)	65.06	10.23
Unclassified nephritis (%)	1405 (0.4)	61.33	16.85
PKD (%)	11,256 (3.6)	65.16	11.37
Nephrosclerosis (%)	29,805 (9.5)	74.25	11.74
Hypertensive emergencies (%)	2618 (0.8)	64.04	14.88
Diabetes (%)	120,278 (38.4)	67.52	11.33
Lupus nephritis (%)	2227 (0.7)	61.64	13.68
Amyloidosis (%)	462 (0.1)	68.19	11.35
Gout (%)	1075 (0.3)	67.76	11.37
Inborn errors of metabolism (%)	274 (0.1)	49.53	17.23
Tuberculosis (%)	195 (0.1)	73.25	8.86
Urolithiasis (%)	581 (0.2)	70.89	11.13
Neoplasm of kidney and urinary tract (%)	910 (0.3)	72.35	10.55
Urinary tract obstruction (%)	730 (0.2)	64.08	16.36
Myeloma (%)	291 (0.1)	70.76	10.83
Hypoplastic kidney (%)	660 (0.2)	45.40	19.35
Undetermined (%)	29,897 (9.5)	69.98	13.12
Rejected kidney (%)	2183 (0.7)	56.77	12.54
Others (%)	8044 (2.6)	66.17	15.45
Subtotal (%)	313,196 (100.0)	67.86	12.49
No information available	21	70.52	11.36
Total	313,217	67.86	12.49

The above data were obtained from the patient survey

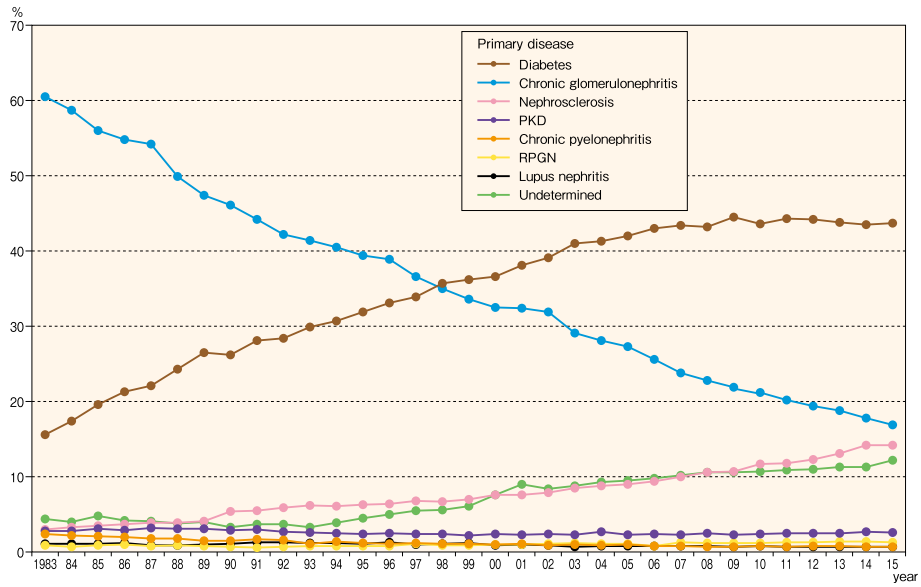

Fig. 9 Incident dialysis patient distribution, by primary disease, 1983–2015. Abbreviations: PKD, polycystic kidney disease; RPGN, rapidly progressive glomerulonephritis

Mean age, sex, and dialysis vintage

The ages and sexes of chronic dialysis patients continues to change over time; hence, patients need to be divided into 2015 incident dialysis patients and prevalent dialysis patients, through which trends were identified over time. The number of patients who were entered into the patient survey table and initiated dialysis in 2015 with confirmed age and sex was 36,792. This is equal to 93.2%, or 2670 persons less than the 39,462 persons recorded into the

Table 13 Incident dialysis patient distribution, by primary disease, 1983–2015

Primary disease	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Diabetes	15.6	17.4	19.6	21.3	22.1	24.3	26.5	26.2	28.1	28.4	29.9	30.7	31.9	33.1	33.9	35.7	36.2
Chronic glomerulonephritis	60.5	58.7	56.0	54.8	54.2	49.9	47.4	46.1	44.2	42.2	41.4	40.5	39.4	38.9	36.6	35.0	33.6
Nephrosclerosis	3.0	3.3	3.5	3.7	3.9	3.9	4.1	5.4	5.5	5.9	6.2	6.1	6.3	6.4	6.8	6.7	7.0
PKD	2.8	2.8	3.1	2.9	3.2	3.1	3.1	2.9	3.0	2.7	2.6	2.5	2.4	2.5	2.4	2.4	2.2
Chronic pyelonephritis	2.4	2.2	2.1	2	1.8	1.8	1.5	1.5	1.7	1.6	1.1	1.4	1.2	1.1	1.2	1.1	1.1
RPGN	0.9	0.7	0.9	1.0	0.8	0.9	0.8	0.7	0.6	0.7	0.8	0.8	0.8	0.8	1.1	0.9	0.9
Lupus nephritis	1.1	1.1	1.1	1.2	0.9	0.9	1.0	1.1	1.3	1.3	1.2	1.2	1.1	1.3	1.0	1.1	1.2
Undetermined	4.4	4.0	4.8	4.2	4.1	3.8	4.0	3.3	3.7	3.7	3.3	3.9	4.5	5.0	5.5	5.6	6.1
Primary disease	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	
Diabetes	36.6	38.1	39.1	41.0	41.3	42.0	42.9	43.4	43.3	44.5	43.6	44.3	44.2	43.8	43.5	43.7	
Chronic glomerulonephritis	32.5	32.4	31.9	29.1	28.1	27.4	25.6	23.8	22.8	21.9	21.0	20.2	19.4	18.8	17.8	16.9	
Nephrosclerosis	7.6	7.6	7.8	8.5	8.8	9.0	9.4	10.0	10.6	10.7	11.7	11.8	12.3	13.1	14.2	14.2	
PKD	2.4	2.3	2.4	2.3	2.7	2.3	2.4	2.3	2.5	2.3	2.4	2.5	2.5	2.5	2.7	2.6	
Chronic pyelonephritis	1.0	1.1	0.9	1.0	0.9	1.0	0.8	0.8	0.7	0.7	0.8	0.7	0.8	0.8	0.7	0.7	
RPGN	1.0	1.0	1.1	1.2	1.1	1.1	1.2	1.3	1.2	1.2	1.2	1.3	1.3	1.4	1.4	1.3	
Lupus nephritis	0.9	1.0	0.9	0.7	0.8	0.8	0.8	0.8	0.8	0.7	0.8	0.7	0.7	0.7	0.7	0.7	
Undetermined	7.6	9.0	8.4	8.8	9.3	9.5	9.9	10.2	10.6	10.7	10.7	10.9	11.0	11.3	11.3	12.2	

The above data were obtained from the patient survey

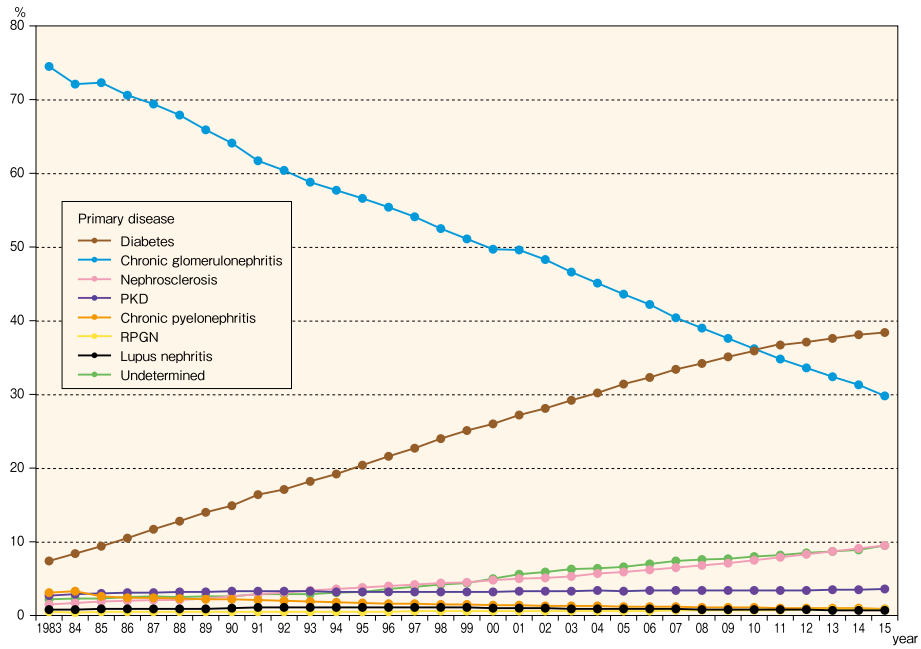

Fig. 10 Prevalent dialysis patient distribution, by primary disease, 1983–2015. Abbreviations: PKD, polycystic kidney disease; RPGN, rapidly progressive glomerulonephritis

facility survey. There were 25,004 males and 11,788 females, and similarly to the previous year, there were approximately twice as many males as females. The mean age of all incident dialysis patients was 69.20 years, representing a 0.16-year increase compared with the 69.04 year mean age at the end of 2014. The mean age was 68.37 years for men and 70.95 years for women, which compared with the previous year represented a 0.23-year and 0.04-year increase, respectively. If incident patients are

Table 14 Prevalent dialysis patient distribution, by primary disease, 1983–2015

Primary disease	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Diabetes	7.4	8.4	9.4	10.5	11.7	12.8	14.0	14.9	16.4	17.1	18.2	19.2	20.4	21.6	22.7	24.0	25.1
Chronic glomerulonephritis	74.5	72.1	72.3	70.6	69.4	67.9	65.9	64.1	61.7	60.4	58.8	57.7	56.6	55.4	54.1	52.5	51.1
Nephrosclerosis	1.5	1.7	1.9	2.0	2.1	2.1	2.3	2.6	2.9	3.1	3.4	3.6	3.8	4.0	4.2	4.4	4.5
PKD	2.7	2.9	3.0	3.1	3.1	3.2	3.2	3.3	3.3	3.3	3.3	3.2	3.2	3.2	3.2	3.2	3.2
Chronic pyelonephritis	3.1	3.3	2.6	2.4	2.4	2.3	2.2	2.2	2.1	2.0	1.9	1.8	1.7	1.6	1.6	1.5	1.5
RPGN	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6
Lupus nephritis	0.8	0.8	0.9	0.9	0.9	0.9	0.9	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Undetermined	2.2	2.3	2.3	2.5	2.6	2.5	2.6	2.6	2.9	2.9	2.9	3.1	3.2	3.6	3.9	4.2	4.4
Primary disease	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	
Diabetes	26.0	27.2	28.1	29.2	30.2	31.4	32.3	33.4	34.2	35.1	35.9	36.7	37.1	37.6	38.1	38.4	
Chronic glomerulonephritis	49.7	49.6	48.2	46.6	45.1	43.6	42.2	40.4	39.0	37.6	36.2	34.8	33.6	32.4	31.3	29.8	
Nephrosclerosis	4.8	5.0	5.1	5.3	5.7	5.9	6.2	6.5	6.8	7.1	7.5	7.9	8.3	8.7	9.1	9.5	
PKD	3.2	3.3	3.3	3.3	3.4	3.3	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.5	3.5	3.6	
Chronic pyelonephritis	1.4	1.4	1.3	1.3	1.3	1.2	1.2	1.2	1.1	1.1	1.1	1.0	1.0	1.0	1.0	0.9	
RPGN	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	
Lupus nephritis	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	
Undetermined	5.0	5.6	5.9	6.3	6.4	6.6	7.0	7.4	7.6	7.7	8.0	8.2	8.5	8.7	8.9	9.5	

The above data were obtained from the patient survey

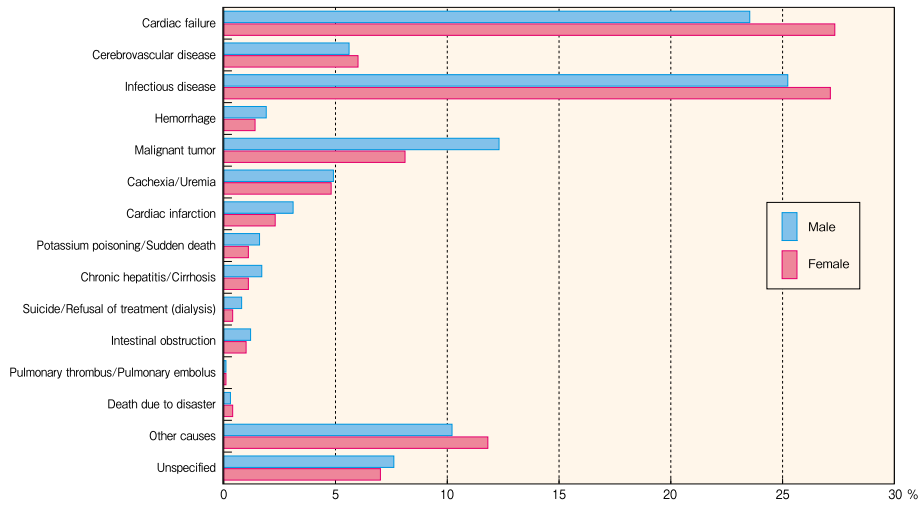

Fig. 11 Incident dialysis patient distribution, by cause of death and sex, 2015

categorized into 5-year age groups (Fig. 3, Table 5), then the age groups with the highest percentages were men aged between 65 and 69 years and women aged between 80 and 84 years. Very elderly patients 75 years or older accounted for 45.8% of females and 36.6% of males. In contrast, the total number of 2015 prevalent patients with sex and age recorded into patient questionnaires was 313,212 persons, equal to 96.4% or 11,774 persons less than the 324,986 persons in facility questionnaires. The mean age of prevalent patients was 67.86 years, or a 0.32-year increase from the previous year. The mean age of males was 67.07 years, which meant a 0.32-year increase, and the mean age of females was 69.28 years, representing a 0.34-year increase (Fig. 4, Table 6). The age group with the highest percentage

Table 15 Incident patient distribution, by cause of death and sex, 2015

Cause of death	Male	Female	Subtotal	No information available	Total
Heart failure (%)	342 (23.5)	192 (27.3)	534 (24.7)		534 (24.7)
Cerebrovascular disorder (%)	82 (5.6)	42 (6.0)	124 (5.7)		124 (5.7)
Infectious disease (%)	366 (25.2)	191 (27.1)	557 (25.8)		557 (25.8)
Hemorrhage (%)	27 (1.9)	10 (1.4)	37 (1.7)		37 (1.7)
Malignant tumors (%)	179 (12.3)	57 (8.1)	236 (10.9)		236 (10.9)
Cachexia/uremia (%)	72 (4.9)	34 (4.8)	106 (4.9)		106 (4.9)
Cardiac infarction (%)	45 (3.1)	16 (2.3)	61 (2.8)		61 (2.8)
Potassium poisoning/sudden death (%)	23 (1.6)	8 (1.1)	31 (1.4)		31 (1.4)
Chronic hepatitis/cirrhosis (%)	25 (1.7)	8 (1.1)	33 (1.5)		33 (1.5)
Suicide/refusal of treatment (dialysis) (%)	12 (0.8)	3 (0.4)	15 (0.7)		15 (0.7)
Intestinal obstruction (%)	17 (1.2)	7 (1.0)	24 (1.1)		24 (1.1)
Pulmonary thrombus/pulmonary embolus (%)	2 (0.1)	1 (0.1)	3 (0.1)		3 (0.1)
Death due to disaster (%)	5 (0.3)	3 (0.4)	8 (0.4)		8 (0.4)
Other causes (%)	148 (10.2)	83 (11.8)	231 (10.7)		231 (10.7)
Unspecified (%)	110 (7.6)	49 (7.0)	159 (7.4)		159 (7.4)
Subtotal (%)	1455 (100.0)	704 (100.0)	2159 (100.0)		2159 (100.0)
No information available	1	2	3		3
Total	1456	706	2162		2162

The above data were obtained from the patient survey

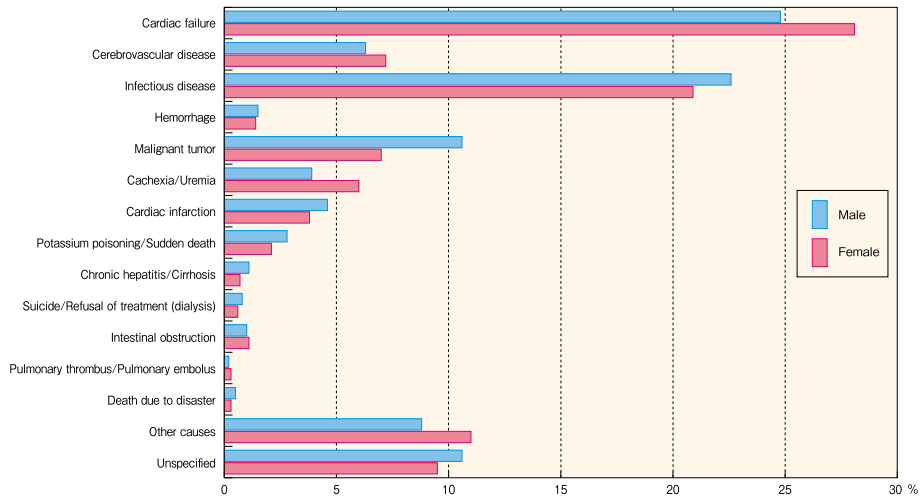

Fig. 12 Deceased dialysis patient distribution, by cause of death and sex, 2015

was males and females aged 65 to 69 years. As shown in the annual changes in the mean age of incident and prevalent patients, both groups exhibited an increase linearly. However, in recent years, this increase has been slowing (Fig. 5, Table 7).

As indicated in the changes over time in the number of prevalent patients in each survey year by age, the number of patients less than 65 years showed signs of increasing by the end of 2011, but this became a decreasing trend from the end of 2012 against the background of increasing age among incident patients. The number of patients younger than 65 years at the end of 2015 was 109,195, a decrease of 3264 persons compared with the end of 2014. In other words, the increase in the number of chronic dialysis patients in Japan was due to the increase in the

Table 16 Deceased dialysis patient distribution, by cause of death and sex, 2015

Cause of death	Male	Female	Subtotal	No information available	Total
Heart failure (%)	4720 (24.8)	2824 (28.1)	7544 (26.0)		7544 (26.0)
Cerebrovascular disorder (%)	1188 (6.3)	728 (7.2)	1916 (6.6)		1916 (6.6)
Infectious disease (%)	4286 (22.6)	2107 (20.9)	6393 (22.0)		6393 (22.0)
Hemorrhage (%)	279 (1.5)	142 (1.4)	421 (1.4)		421 (1.4)
Malignant tumors (%)	2013 (10.6)	704 (7.0)	2717 (9.3)		2717 (9.3)
Cachexia/uremia (%)	740 (3.9)	599 (6.0)	1339 (4.6)		1339 (4.6)
Cardiac infarction (%)	867 (4.6)	378 (3.8)	1245 (4.3)		1245 (4.3)
Potassium poisoning/sudden death (%)	538 (2.8)	210 (2.1)	748 (2.6)		748 (2.6)
Chronic hepatitis/cirrhosis (%)	206 (1.1)	74 (0.7)	280 (1.0)		280 (1.0)
Suicide/refusal of treatment (dialysis) (%)	155 (0.8)	57 (0.6)	212 (0.7)		212 (0.7)
Intestinal obstruction (%)	194 (1.0)	113 (1.1)	307 (1.1)		307 (1.1)
Pulmonary thrombus/pulmonary embolus (%)	42 (0.2)	30 (0.3)	72 (0.2)		72 (0.2)
Death due to disaster (%)	94 (0.5)	34 (0.3)	128 (0.4)		128 (0.4)
Other causes (%)	1663 (8.8)	1111 (11.0)	2774 (9.5)		2774 (9.5)
Unspecified (%)	2012 (10.6)	956 (9.5)	2968 (10.2)		2968 (10.2)
Subtotal (%)	18,997 (100.0)	10,067 (100.0)	29,064 (100.0)		29,064 (100.0)
No information available	11	14	25		25
Total	19,008	10,081	29,089		29,089

The above data were obtained from the patient survey

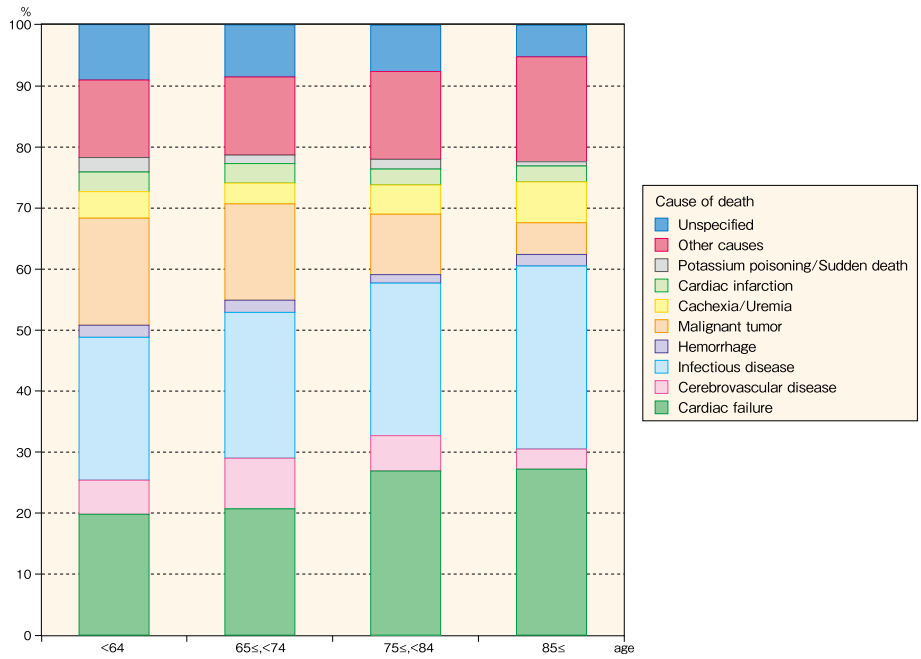

Fig. 13 Incident dialysis patient distribution, by cause of death and age, 2015

number of patients aged 65 years or older. Furthermore, an increase was observed in the percentage of the very elderly aged 75 years or older, resulting in 5560 dialysis patients aged 90 years or older (Fig. 6, Table 8).

The dialysis vintages of 2015 prevalent patients were evaluated in a 5-year-segment (Fig. 7, Table 9), then patients with a dialysis vintage of less than 5 years accounted for 47.3% of the total. Twenty-five thousand three hundred ninety-one patients had a dialysis vintage of 20 years or longer, which represents an increase of 561 persons or 8.1% of the total compared with the previous year. Six hundred seventeen persons had a dialysis vintage of longer than

Table 17 Incident dialysis patient distribution, by cause of death and age, 2015

Cause of death	< 65	65 ≤, < 75	75 ≤, < 85	85 ≤	Subtotal	Unspecified	No information available	Total
Heart failure (%)	50 (19.8)	102 (20.7)	235 (26.9)	147 (27.2)	534 (24.7)			534 (24.7)
Cerebrovascular disorder (%)	14 (5.6)	41 (8.3)	51 (5.8)	18 (3.3)	124 (5.7)			124 (5.7)
Infectious disease (%)	59 (23.4)	118 (23.9)	218 (25.0)	162 (30.0)	557 (25.8)			557 (25.8)
Hemorrhage (%)	5 (2.0)	10 (2.0)	12 (1.4)	10 (1.9)	37 (1.7)			37 (1.7)
Malignant tumors (%)	44 (17.5)	78 (15.8)	86 (9.9)	28 (5.2)	236 (10.9)			236 (10.9)
Cachexia/uremia (%)	11 (4.4)	17 (3.4)	42 (4.8)	36 (6.7)	106 (4.9)			106 (4.9)
Cardiac infarction (%)	8 (3.2)	16 (3.2)	23 (2.6)	14 (2.6)	61 (2.8)			61 (2.8)
Potassium poisoning/sudden death (%)	6 (2.4)	7 (1.4)	14 (1.6)	4 (0.7)	31 (1.4)			31 (1.4)
Other causes (%)	32 (12.7)	63 (12.8)	126 (14.4)	93 (17.2)	314 (14.6)			314 (14.5)
Unspecified (%)	23 (9.1)	41 (8.3)	66 (7.6)	28 (5.2)	158 (7.3)	1 (100.0)		159 (7.4)
Subtotal (%)	252 (100.0)	493 (100.0)	873 (100.0)	540 (100.0)	2158 (100.0)	1 (100.0)		2159 (100.0)
No information available	1		1	1	3			3
Total	253	493	874	541	2161	1		2162

The above data were obtained from the patient survey

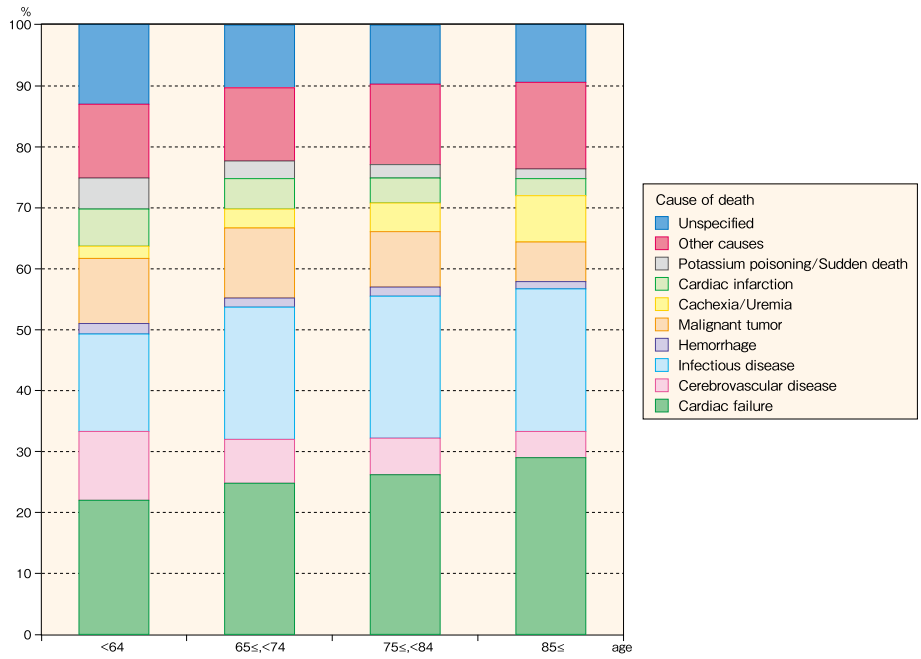

Fig. 14 Deceased dialysis patient distribution, by causes of death and age, 2015

40 years, it was 0.2% of all dialysis patients. The longest dialysis vintage was 47 years and 6 months. Regardless of dialysis vintage, the absolute number of males tended to be higher than females, a difference that became smaller the longer the dialysis vintage is. At less than 5 years, the male percentage was 67.5%, but it decreased to 51.4% in patients with dialysis vintages of 30 to 34 years. However, the percentage of male patients with dialysis vintages of 35 to 39 years and 40 years or longer increased again to 53.2 and 55.3%, respectively. Chronic dialysis therapy was first covered by insurance in Japan in 1967, and it is believed this had an effect. The percentage of patients with vintages less than 5 years has gradually

Table 18 Deceased patient distribution, by causes of death and age, 2015

Cause of death	< 65	65 ≤, < 75	75 ≤, < 85	85 ≤	Subtotal	Unspecified	No information available	Total
Heart failure (%)	776 (22.0)	1960 (24.8)	2905 (26.2)	1901 (29.0)	7542 (26.0)	2 (18.2)		7544 (26.0)
Cerebrovascular disorder (%)	400 (11.3)	568 (7.2)	666 (6.0)	282 (4.3)	1916 (6.6)			1916 (6.6)
Infectious disease (%)	567 (16.0)	1716 (21.7)	2576 (23.3)	1533 (23.4)	6392 (22.0)	1 (9.1)		6393 (22.0)
Hemorrhage (%)	60 (1.7)	122 (1.5)	162 (1.5)	77 (1.2)	421 (1.4)			421 (1.4)
Malignant tumors (%)	377 (10.7)	911 (11.5)	1004 (9.1)	425 (6.5)	2717 (9.4)			2717 (9.3)
Cachexia/uremia (%)	72 (2.0)	248 (3.1)	521 (4.7)	498 (7.6)	1339 (4.6)			1339 (4.6)
Cardiac infarction (%)	215 (6.1)	392 (5.0)	452 (4.1)	186 (2.8)	1245 (4.3)			1245 (4.3)
Potassium poisoning/sudden death (%)	181 (5.1)	225 (2.9)	240 (2.2)	102 (1.6)	748 (2.6)			748 (2.6)
Other causes (%)	426 (12.1)	950 (12.0)	1465 (13.2)	929 (14.2)	3770 (13.0)	3 (27.3)		3774 (13.0)
Unspecified (%)	460 (13.0)	800 (10.1)	1078 (9.7)	625 (9.5)	2963 (10.2)	5 (45.5)		2968 (10.2)
Subtotal (%)	3534 (100.0)	7892 (100.0)	11,069 (100.0)	6558 (100.0)	29,053 (100.0)	11 (100.0)		29,064 (100.0)
No information available	3	6	8	8	25			25
Total	3537	7898	11,077	6566	29,078	11		29,089

The above data were obtained from the patient survey

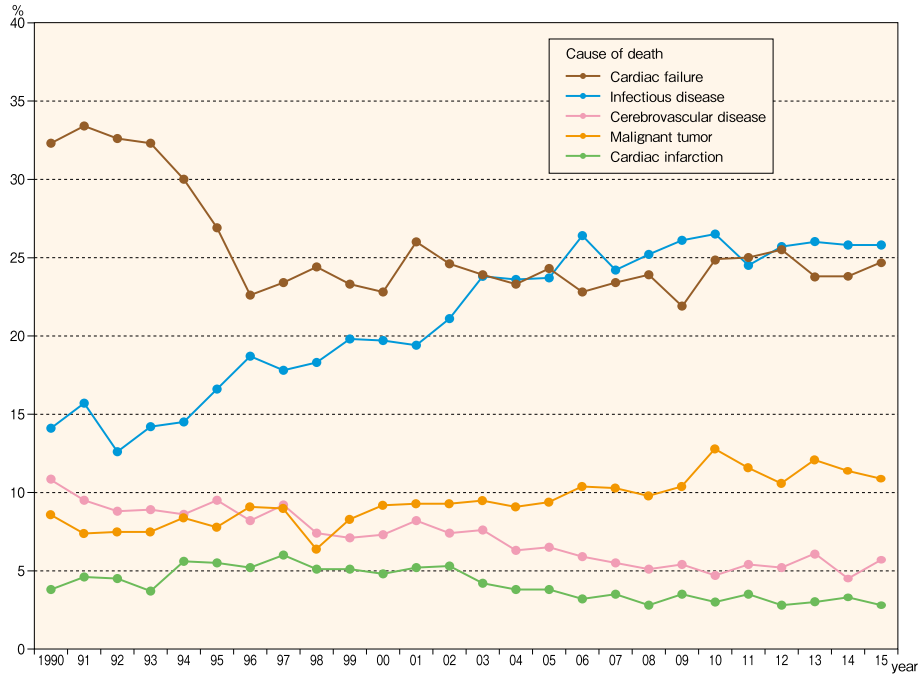

Fig. 15 Causes of death during the incident year, 1990–2015

decreased, whereas patients with long vintages have been increasing. Patients with dialysis vintages of 10 years or longer have now reached 27.8%. Patients with vintages of 20 years or longer did not reach 1.0% in 1992, but reached 8.1% by the end of 2015 (Fig. 8, Table 10).

Primary diseases

The primary diseases of chronic dialysis patients have continued to change over time; hence, incident dialysis patients and 2015 prevalent patients need to be divided for the study. We shall discuss this point while comparing the two groups.

The most frequent primary disease among the 2015 incident dialysis patients was diabetic nephropathy, chronic glomerulonephritis, and nephrosclerosis at 43.7, 16.9, and 14.2%, respectively; however, 12.2% had an unknown primary disease. The mean age at incidence was 67.29, 68.77, and 75.33 years for diabetic nephropathy, chronic glomerulonephritis, and

Table 19 Causes of death during the incident year, 1990–2015

Cause of death	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Cardiac failure	32.3	33.4	32.6	32.3	30.0	26.9	22.6	23.4	24.4	23.3	22.8	26.0	24.6
Infectious disease	14.1	15.7	12.6	14.2	14.5	16.6	18.7	17.8	18.3	19.8	19.7	19.4	21.1
Cerebrovascular disease	10.8	9.5	8.8	8.9	8.6	9.5	8.2	9.2	7.4	7.1	7.3	8.2	7.4
Malignant tumor	8.6	7.4	7.5	7.5	8.4	7.8	9.1	9.0	6.4	8.3	9.2	9.3	9.3
Cardiac infarction	3.8	4.6	4.5	3.7	5.6	5.5	5.2	6.0	5.1	5.1	4.8	5.2	5.3
Cause of death	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Cardiac failure	23.9	23.3	24.3	22.8	23.2	24.1	21.8	24.9	25.0	25.5	23.8	23.8	24.7
Infectious disease	23.8	23.6	23.7	26.4	24.2	25.2	26.1	26.5	24.5	25.7	26.0	25.8	25.8
Cerebrovascular disease	7.6	6.3	6.5	5.9	5.5	5.1	5.4	4.8	5.4	5.2	6.1	4.5	5.7
Malignant tumor	9.5	9.1	9.4	10.4	10.3	9.8	10.4	12.5	11.6	10.6	12.1	11.4	10.9
Cardiac infarction	4.2	3.8	3.8	3.2	3.5	2.8	3.5	3.0	3.5	2.8	3.0	3.3	2.8

The above data were obtained from the patient survey

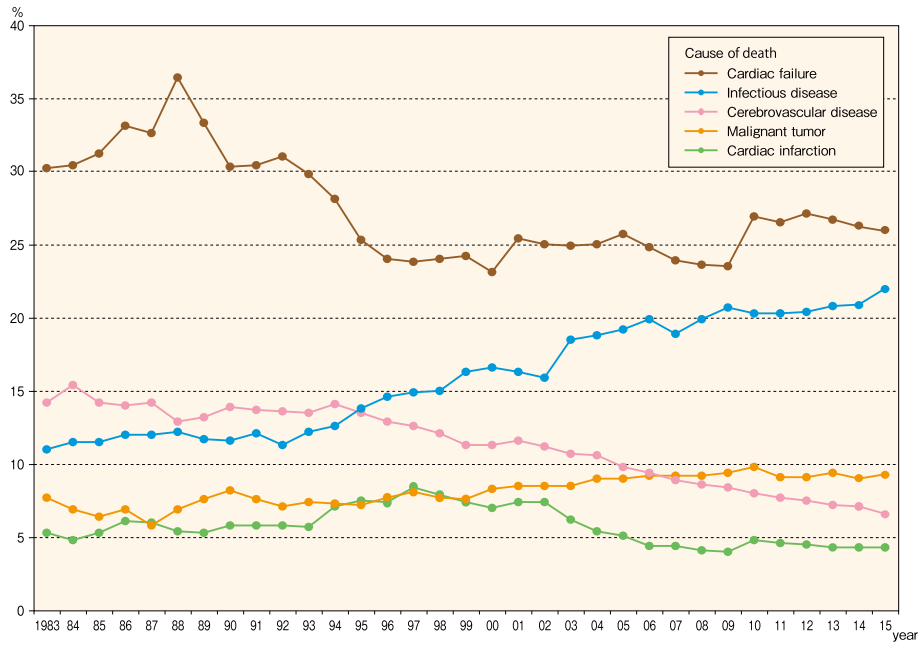

Fig. 16 Major causes of death, 1983–2015

nephrosclerosis, respectively (Table 11). The most frequent primary disease for 2015 prevalent patients was diabetic nephropathy, chronic glomerulonephritis, and nephrosclerosis at 38.4, 29.8, and 9.5%, respectively; however, 9.5% had an unknown primary disease (Table 12). The mean age was 66.90, 67.52, and 74.25 years for chronic glomerulonephritis, diabetic nephropathy, and nephrosclerosis, respectively. Both incident and prevalent dialysis patients showed a high mean age for nephrosclerosis and a low mean age for kidney diseases due to congenital abnormalities.

The annual changes in primary diseases of incident dialysis patients showed that diabetic nephropathy was supplanted by chronic glomerulonephritis in 1998, which then became the most prevalent primary disease. Subsequently, the percentage of diabetic nephropathy exhibited an increasing trend, but then remained largely constant these past several years. The percentage of chronic glomerulonephritis has continued to decrease. In contrast, the percentage of nephrosclerosis and unknown primary disease has continued to increase (Fig. 9, Table 13).

Table 20 Major causes of death, 1983–2015

Cause of death	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Cardiac failure	30.3	30.5	31.3	33.2	32.7	36.5	33.4	30.4	30.5	31.1	29.9	28.2	25.4	24.1	23.9	24.1	24.3
Infectious disease	11.0	11.5	11.5	12.0	12.0	12.2	11.7	11.6	12.1	11.3	12.2	12.6	13.8	14.6	14.9	15.0	16.3
Cerebrovascular disease	14.2	15.4	14.2	14.0	14.2	12.9	13.2	13.9	13.7	13.6	13.5	14.1	13.5	12.9	12.6	12.1	11.3
Malignant tumor	7.7	6.9	6.4	6.9	5.8	6.9	7.6	8.2	7.6	7.1	7.4	7.3	7.2	7.7	8.1	7.7	7.6
Cardiac infarction	5.3	4.8	5.3	6.1	6.0	5.4	5.3	5.8	5.8	5.8	5.7	7.1	7.5	7.4	8.4	7.9	7.4
Cause of death	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	
Cardiac failure	23.2	25.5	25.1	25.0	25.1	25.8	24.9	24.0	23.7	23.6	27.0	26.6	27.2	26.8	26.3	26.0	
Infectious disease	16.6	16.3	15.9	18.5	18.8	19.2	19.9	18.9	19.9	20.7	20.3	20.3	20.4	20.8	20.9	22.0	
Cerebrovascular disease	11.3	11.6	11.2	10.7	10.6	9.8	9.4	8.9	8.6	8.4	8.1	7.7	7.5	7.2	7.1	6.6	
Malignant tumor	8.3	8.5	8.5	8.5	9.0	9.0	9.2	9.2	9.2	9.4	9.8	9.1	9.1	9.4	9.0	9.3	
Cardiac infarction	7.0	7.4	7.4	6.2	5.4	5.1	4.4	4.4	4.1	4.0	4.7	4.6	4.5	4.3	4.3	4.3	

The above data were obtained from the patient survey

Table 21 Annual crude death rate, 1983–2015

	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Crude death rate (%)	9.0	8.9	9.1	9.0	8.5	9.2	7.9	9.6	8.9	9.7	9.4	9.5	9.7	9.4	9.4	9.2	9.7
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	
Crude death rate (%)	9.2	9.3	9.2	9.3	9.4	9.5	9.2	9.4	9.8	9.6	9.8	10.2	10.0	9.8	9.7	9.6	

The above data were obtained from the facility survey

As the main primary disease among prevalent patients changed, diabetic nephropathy continuously increased and supplanted chronic glomerulonephritis in the 2011 survey as the most frequent primary disease. Thereafter, it has continuously increased, but the rate of increase seems to ebb slightly (Fig. 10, Table 14). Chronic glomerulonephritis is decreasing linearly, whereas nephrosclerosis and unknown primary diseases are continuously increasing. Otherwise, the numbers for polycystic kidney disease, chronic pyelonephritis, SLE nephritis, and rapidly progressive glomerulonephritis, for example, have remained constant as similar to previous years.

Causes of death

We compared the causes of death for all 2015 incident dialysis patients and 2015 prevalent dialysis patients overall. The highest causes of death in 2015 incident dialysis patients by sex were infectious disease (25.2%), heart failure (23.5%), malignant tumor (12.3%), and others (10.2%) in males and heart failure (27.3%), infectious disease (27.1%), others (11.8%), and malignant tumor (8.1%) in females. This ranking for males was the same as that at the end of 2014, but there was a 1.1-point decrease in infectious disease, a 0.4-point decrease in malignancy, and a 0.7-point increase in heart failure. This ranking for females has had heart failure as the most prevalent cause since 2010, and it increased by 1.8 points compared with that at the end of 2014. Overall, infectious disease was the most prevalent mortality factor at 25.8%, followed by heart failure (24.7%) as the second, and malignant tumor (10.9%) as the third (Fig. 11, Table 15). In the 2015 facility survey, 31,068 deaths were reported, but in the patient survey, the number of patients with cause of death and sex recorded was 29,064 persons, which was equal to 93.5% of the 31,068 deceased. Male mortality factors from the highest to the lowest were heart failure (24.8%), infectious disease (22.6%), malignancy (10.6%), and cerebrovascular disease (6.3%). Among females, the ranked list was heart failure (28.1%), infectious disease (20.9%), cerebrovascular disease (7.2%), and malignancy (7.0%). The ranked list among all deceased

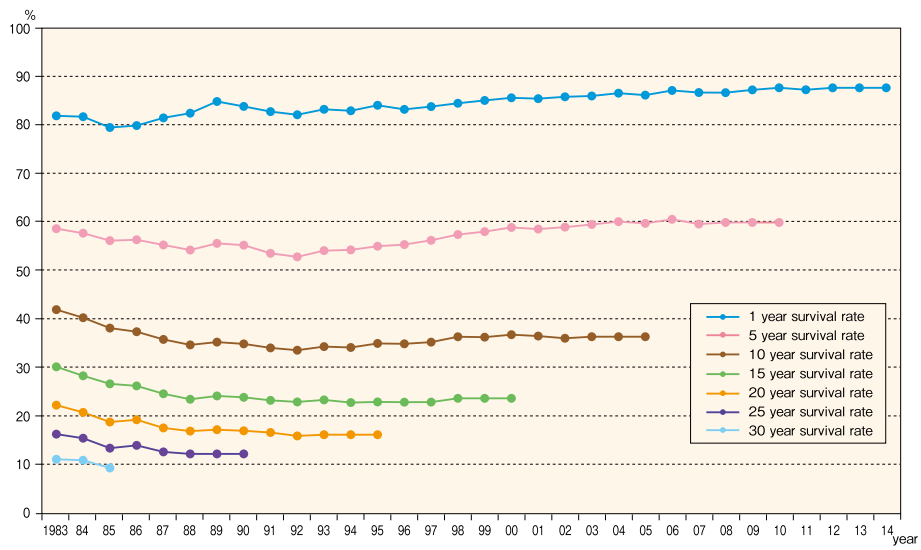

Fig. 17 1-, 5-, 10-, 15-, 20-, 25-, and 30-year survival rate, 1983–2014

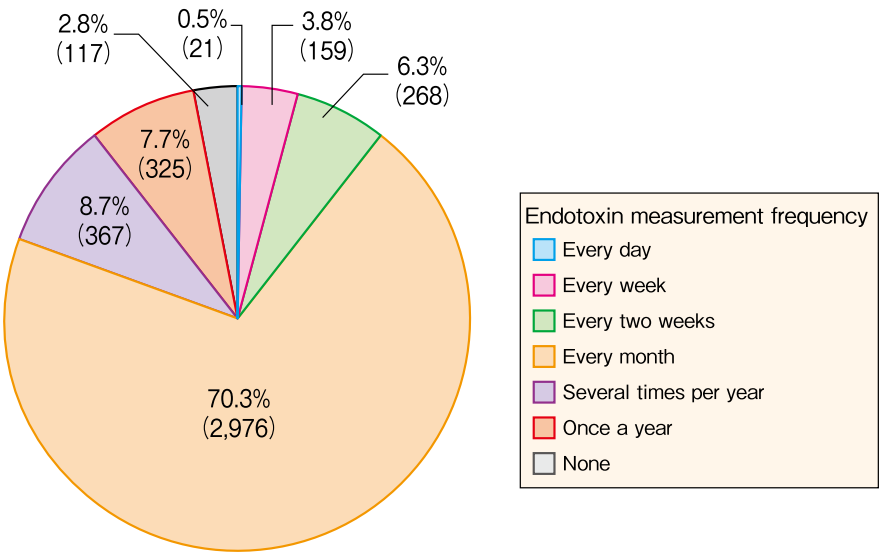

Fig. 18 Facility distribution, by endotoxin measurement frequency, 2015

patients was heart failure (26.0%), infectious disease (22.0%), malignant tumor (9.3%), and cerebrovascular disease (6.6%).

No change was observed in the order of any mortality factors by sex since 2014. The percentage of cardiovascular disease combining heart failure, cerebrovascular disease, and myocardial infarction was 35.7% among males, 39.0% among females, and 36.8% of the total (Fig. 12, Table 16).

Comparing mortality factors by age group (Fig. 13, Table 17), the ages at death among incident patients in 2015 increased, and deaths due to heart failure, infectious disease, and cachexia/uremia also increased. Particularly, among those aged 85 years or older, deaths from infectious disease reached 30.0%. This was largely the same trend seen in all mortality factors by age group for 2015 (Fig. 14, Table 18).

Regarding the changes over time in the cause of death among patients who died during the incident year, heart failure was the most prevalent mortality factor in the 1990s, but infectious disease gradually rose to reach a percentage nearly the same as heart failure since mid-2000, and even exceeded heart failure. In 2015 as well, infectious disease was the most

Table 22 Facility distribution, by endotoxin measurement frequency and concentration, 2015

Endotoxin concentration in dialysis fluid (EU/ml)	Every day	Every week	Every 2 weeks	Every month	Several times per year	Once a year	None	Subtotal	Unspecified	No information available	Total
< 0.001 (%)	18 (0.6)	131 (4.0)	227 (7.0)	2387 (73.1)	261 (8.0)	241 (7.4)	1 (0.0)	3266 (100.0)	2		3268
0.001 ≤, < 0.01 (%)	1 (0.2)	18 (3.5)	23 (4.5)	372 (73.1)	58 (11.4)	37 (7.3)		509 (100.0)			509
0.01 ≤, < 0.05 (%)		6 (2.9)	13 (6.2)	139 (66.5)	26 (12.4)	25 (12.0)		209 (100.0)			209
0.05 ≤, < 0.1 (%)		2 (3.6)	3 (5.5)	32 (58.2)	7 (12.7)	11 (20.0)		55 (100.0)			55
0.1 ≤, < 0.25 (%)	1 (3.0)	2 (6.1)		22 (66.7)	5 (15.2)	3 (9.1)		33 (100.0)			33
0.25 ≤, < 0.5 (%)			1 (5.6)	11 (61.1)	3 (16.7)	3 (16.7)		18 (100.0)	1		19
0.5 ≤ (%)			1 (6.3)	11 (68.8)	1 (6.3)	3 (18.8)		16 (100.0)			16
Subtotal (%)	20 (0.5)	159 (3.9)	268 (6.5)	2974 (72.4)	361 (8.8)	323 (7.9)	1 (0.0)	4106 (100.0)	3		4109
Unspecified (%)	1 (1.4)			2 (2.8)	6 (8.5)	2 (2.8)	60 (84.5)	71 (100.0)	60		131
No information available (%)							56 (100.0)	56 (100.0)		7	63
Total (%)	21 (0.5)	159 (3.8)	268 (6.3)	2976 (70.3)	367 (8.7)	325 (7.7)	117 (2.8)	4233 (100.0)	63	7	4303

Values in parentheses under each figure represent the percentage relative to the subtotal in each row

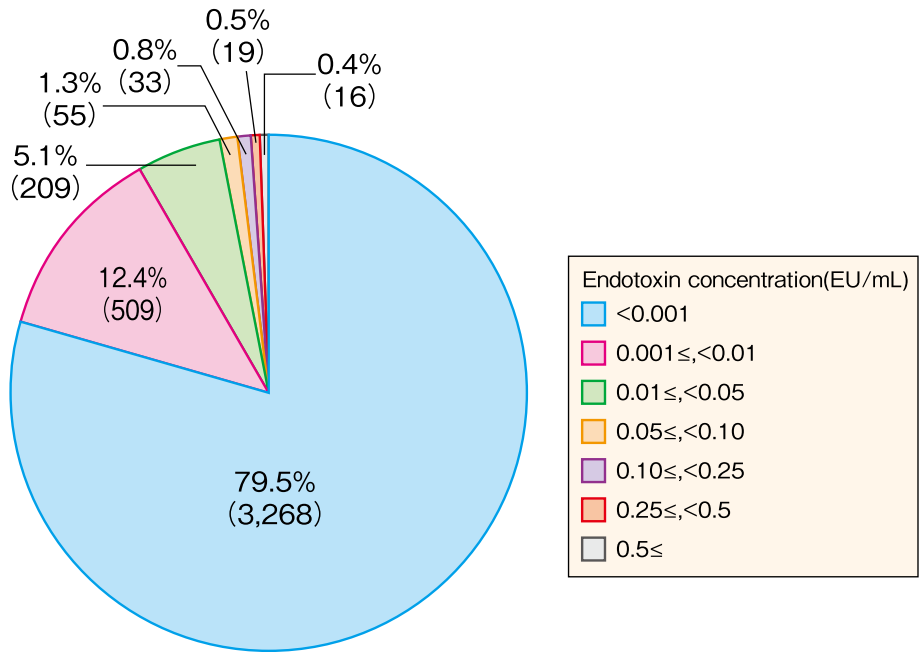

Fig. 19 Facility distribution, by endotoxin concentration, 2015

prevalent factor (25.8%), followed by heart failure as the second (24.7%). The order from the third most prevalent factor did not change: malignant tumor (10.9%), cerebrovascular disease (5.7%), and myocardial infarction (2.8%). Over the long term, death by cerebrovascular disease or myocardial infarction tended to decrease, whereas death due to infectious disease or malignancy tended to increase (Fig. 15, Table 19).

As for overall dialysis patients' changes in cause of death over time, death by infectious disease has consistently increased since 1993. Although its rate of increase slowed until last year, this year it again increased by 1.1%. Cerebrovascular disease has been consistently on a

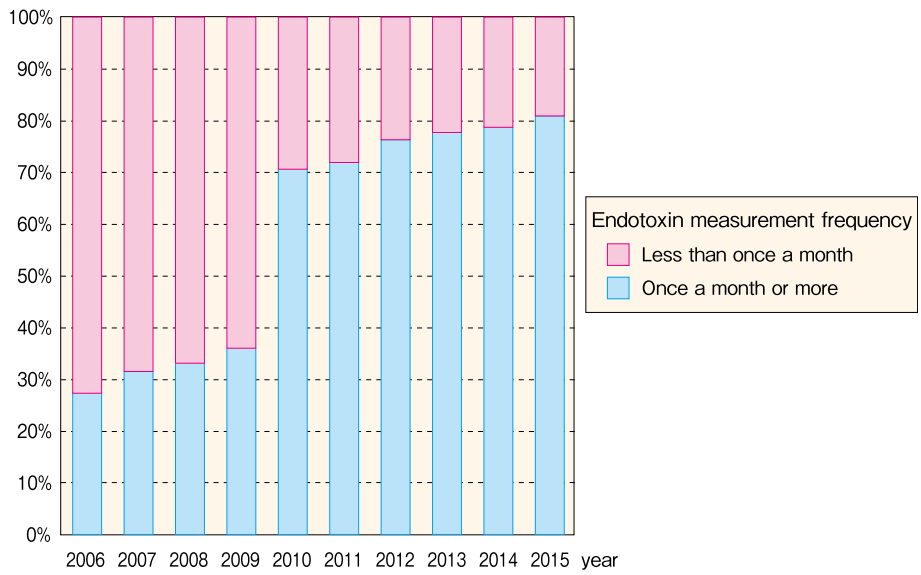

Fig. 20 Facility distribution, by endotoxin measurement frequency, 2006–2015

Table 23 Facility distribution, by endotoxin measurement frequency, 2006–2015

Frequency of measurement (per month)	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
1 ≤ (%)	953 (27.3)	1153 (31.5)	1253 (33.1)	1373 (36.0)	2810 (70.6)	2914 (71.9)	3141 (76.3)	3238 (77.7)	3329 (78.7)	3424 (80.9)
< 1 (%)	2535 (72.7)	2511 (68.5)	2531 (66.9)	2436 (64.0)	1170 (29.4)	1137 (28.1)	977 (23.7)	929 (22.3)	900 (21.3)	809 (19.1)
Subtotal (%)	3488 (100.0)	3664 (100.0)	3784 (100.0)	3809 (100.0)	3980 (100.0)	4051 (100.0)	4118 (100.0)	4167 (100.0)	4229 (100.0)	4233 (100.0)
Unspecified	185	209	244	193	92	99	77	65	69	63
No information available	312	179	53	48	52	27	8	3	6	7
Total	3985	4052	4081	4050	4124	4177	4203	4235	4304	4303

Values in parentheses under each figure represent the percentage relative to the total in each column

gradual decrease since 1994. Recently, myocardial infarction-related deaths have been on a gradually decreasing trend from a peak of 8.4% in 1997. The deaths from malignant tumor have gradually increased starting from 5.8% at the end of 1987, but have remained roughly level since reaching approximately 9.0% in 2004. Categorizing deaths due to heart failure, cerebrovascular disease, and myocardial infarction as cardiovascular deaths, they represented 54.8% of the total in 1988, and then decreased at a largely fixed pace, reaching 36.0% in 2009 (Fig. 16, Table 20). Furthermore, the cause of death category codes in this survey have been greatly revised at two points, the 2003 and the 2010 JRDR survey (see the 2010 JRDR report for details of the revisions [9]).

Crude death rate and survival rate

We calculated the annual crude death rate from patient dynamics in the facility survey. Because incident patients increased in age and included greater numbers of those with diabetic nephropathy and those with poor prognosis due to nephrosclerosis or other factors, the crude death rate tended to worsen annually. The lowest crude death rate was 7.9% in 1989, a year with a low questionnaire response rate. However, the rate exceeded 9.0% as 9.7% in 1992 and has remained approximately 9.2% to 9.8% since then, reaching 9.6% in 2015 (Table 21).

At of the end of 2015, the survival rate was 89.9% for 1-year survival of 35,864 patients who initiated dialysis in 2014, 60.8% for five-year survival of patients who

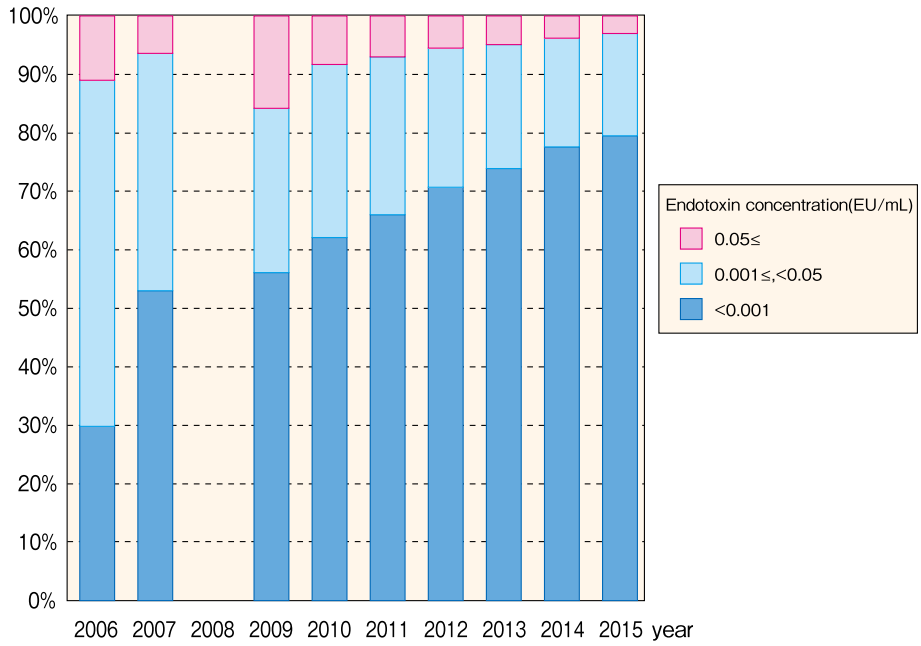

Fig. 21 Facility distribution, by endotoxin concentration, 2006–2015

Table 24 Facility distribution, by endotoxin concentration, 2006–2015

Endotoxin concentration in dialysis fluid (EU/ml)	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
< 0.001 (%)	817 (29.8)	1688 (53.0)	–	1865 (56.1)	2343 (62.1)	2549 (66.0)	2787 (70.7)	2963 (73.9)	3167 (77.6)	3268 (79.5)
0.001 ≤, < 0.05 (%)	1627 (59.2)	1295 (40.6)	–	933 (28.1)	1115 (29.6)	1042 (27.0)	938 (23.8)	849 (21.2)	759 (18.6)	718 (17.5)
0.05 ≤ (%)	302 (11.0)	203 (6.4)	–	527 (15.8)	314 (8.3)	271 (7.0)	216 (5.5)	195 (4.9)	153 (3.8)	123 (3.0)
Subtotal (%)	2746 (100.0)	3186 (100.0)	–	3325 (100.0)	3772 (100.0)	3862 (100.0)	3941 (100.0)	4007 (100.0)	4079 (100.0)	4109 (100.0)
Unspecified	–	215	–	253	105	112	197	148	164	131
No information available	1239	651	–	472	247	203	65	80	61	63
Total	3985	4052	–	4050	4124	4177	4203	4235	4304	4303

The unit of endotoxin in the questionnaire has changed in 2008. The data of the year were omitted because of the potentially higher rate of erroneous results
Values in parentheses under each figure represent the percentage relative to the total in each column

initiated dialysis in 2010, 35.9% for 10-year survival of patients who initiated dialysis in 2005, 23.5% for 15-year survival of patients who initiated dialysis in 2000, 15.4% for 20-year survival of patients who initiated dialysis in 1995, and 11.8% for 25-year survival of patients who initiated dialysis in 1990. Concerning the individual changes in survival rate over time, the short-term prognosis for 1- and 5-year vintage dialysis patients continuously improved, even though the number of elderly diabetic patients increased (Fig. 17, Additional file 1: Table S1).

Chapter 2: current status of dialysis fluid quality management

Overview of dialysis fluid quality

In the JRDR survey, a survey was started from the end of 2006 on microbiological quality of dialysis fluid and its management. Based on the results, the JSDT standard for dialysis fluid microbial quality was revised in 2008 [10]. In this standard, dialysis fluid microbial quality should be evaluated based on both ET concentration and total viable microbial count (TVC). These both should be evaluated more frequently than once monthly. At least two bedside consoles should be tested in every month, and all consoles were tested a minimum of once annually. The required minimum quality used in dialysis therapy was defined as "standard dialysis fluid" with a dialysis fluid ET concentration < 0.05 EU/mL, and TVC < 100 cfu/mL. "Ultra-pure dialysis fluid (UPD)" is defined as having a dialysis fluid ET concentration < 0.001 EU/mL (less than the detectable limit), and TVC < 0.1 cfu/mL. JSDT recommended the use of

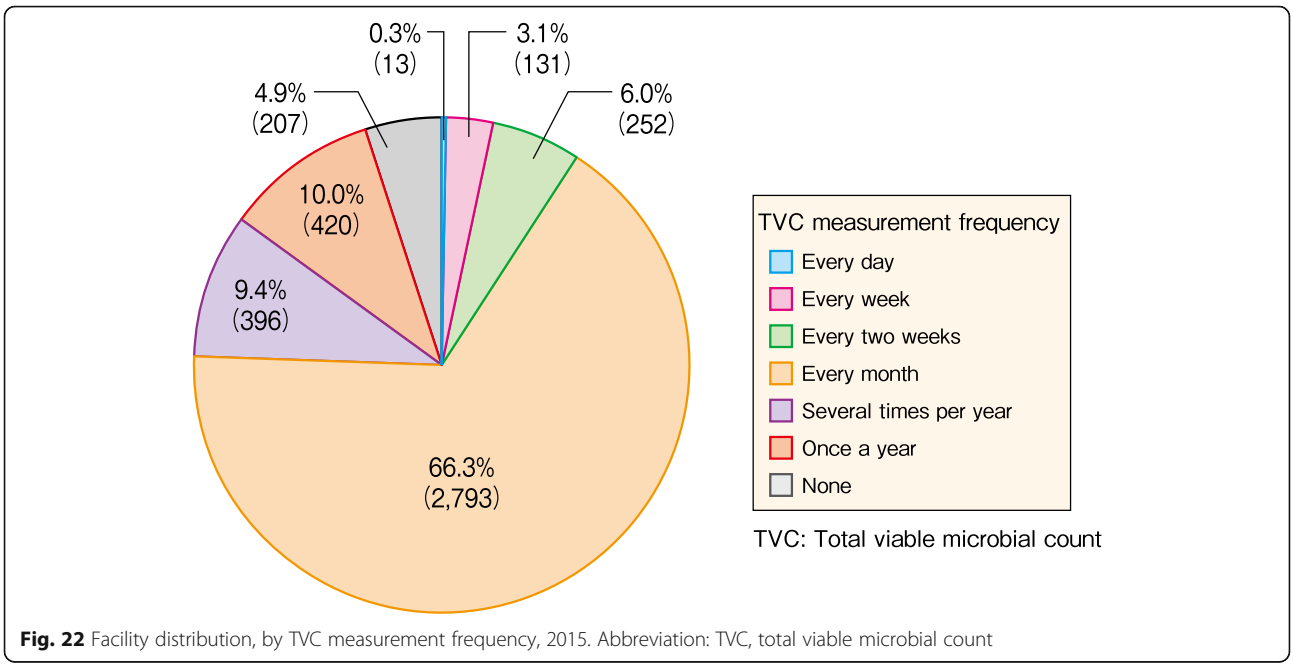

Fig. 22 Facility distribution, by TVC measurement frequency, 2015. Abbreviation: TVC, total viable microbial count

Table 25 Facility distribution, by microbial measurement frequency and TVC

TVC (cfu/mL)	Every day	Every week	Every 2 week	Every month	Several times per year	Once a year	None	Subtotal	Unspecified	No information available	Total
< 0.1 (%)	11 (0.4)	99 (3.4)	194 (6.7)	2013 (69.4)	278 (9.6)	306 (10.5)	1 (0.0)	2902 (100.0)	3		2905
0.1 ≤, < 1 (%)		11 (2.3)	25 (5.1)	351 (72.1)	46 (9.4)	54 (11.1)		487 (100.0)	2		489
1 ≤, < 10 (%)	1 (0.3)	15 (3.9)	22 (5.7)	281 (72.6)	39 (10.1)	29 (7.5)		387 (100.0)			387
10 ≤, < 100 (%)		5 (3.1)	9 (5.6)	108 (67.1)	22 (13.7)	17 (10.6)		161 (100.0)			161
100 ≤ (%)	1 (4.2)			18 (75.0)	1 (4.2)	4 (16.7)		24 (100.0)			24
Subtotal (%)	13 (0.3)	130 (3.3)	250 (6.3)	2771 (70.0)	386 (9.7)	410 (10.4)	1 (0.0)	3961 (100.0)	5		3966
Unspecified (%)		1 (0.7)	2 (1.4)	21 (14.2)	10 (6.8)	10 (6.8)	104 (70.3)	148 (100.0)	79		227
No information available (%)				1 (1.0)			102 (99.0)	103 (100.0)		7	110
Total (%)	13 (0.3)	131 (3.1)	252 (6.0)	2793 (66.3)	396 (9.4)	420 (10.0)	207 (4.9)	4212 (100.0)	84	7	4303

Values in parentheses under each figure represent the percentage relative to the subtotal in each row

UPD for all dialysis therapies. At the time these standards were adopted, as well as in 2016, they were the strictest criteria in the world. Furthermore, in the 2010 revision of the medical payment system, dialysis fluid quality was newly added, and thus, dialysis fluid quality control dramatically improved from the 2010 survey [9]. In 2015, dialysis fluid ET concentration and dialysis patient prognosis were analyzed using the JRDR data, and the patient group that was being treated at facilities with a dialysis fluid ET concentration < 0.001 EU/mL reportedly had a clearly higher 1-year survival rate than the patient group undergoing treatment at facilities with a concentration of 0.100 EU/mL or higher [11]. The dialysis fluid quality and its control were evaluated in 4303 facilities which had one or more bedside consoles in the 2015 survey.

Dialysis fluid ET testing

Dialysis fluid ET concentration is recommended to be measured by limulus tests in the JSDT standard [9]. In Japan, these ET assay systems are available at a relatively low cost and are widely used in most dialysis facilities. However, this situation is quite unique in the world. In a total of 4303, facilities had one or more bedside consoles, wherein 4233 facilities (98.4%) responded with their dialysis fluid ET assay frequency. These include 3424 facilities (80.9%) satisfying the once monthly or more rule in the standard (Fig. 18,

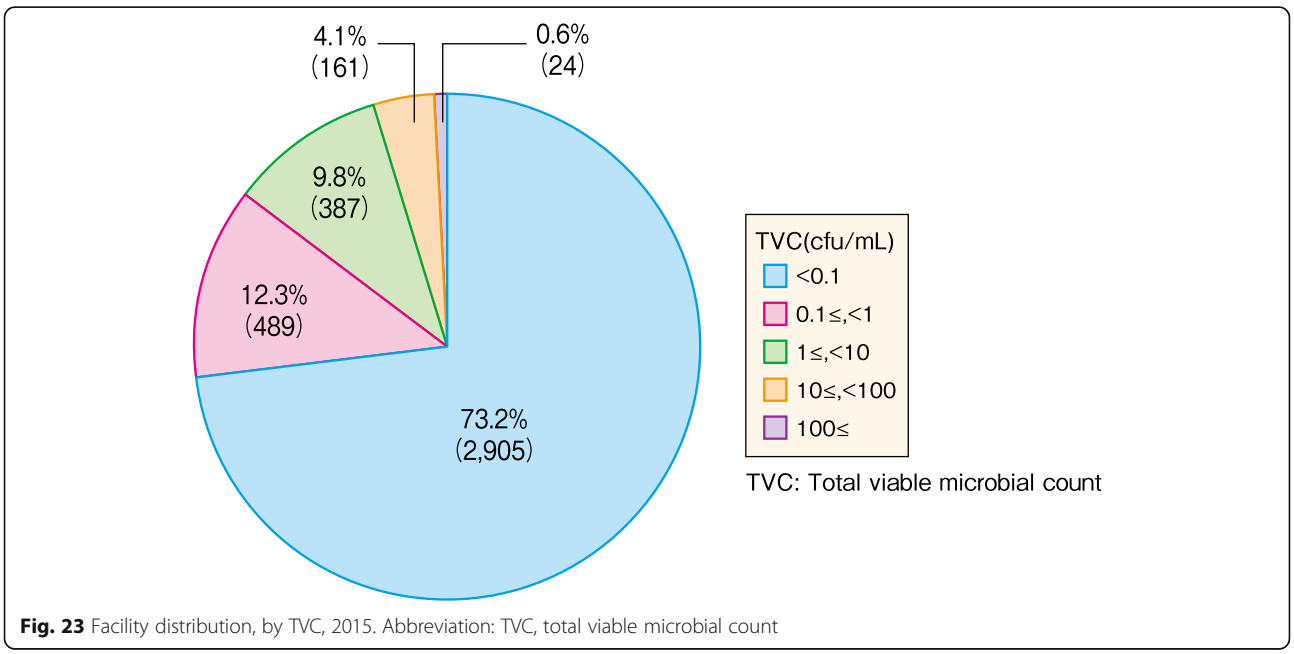

Fig. 23 Facility distribution, by TVC, 2015. Abbreviation: TVC, total viable microbial count

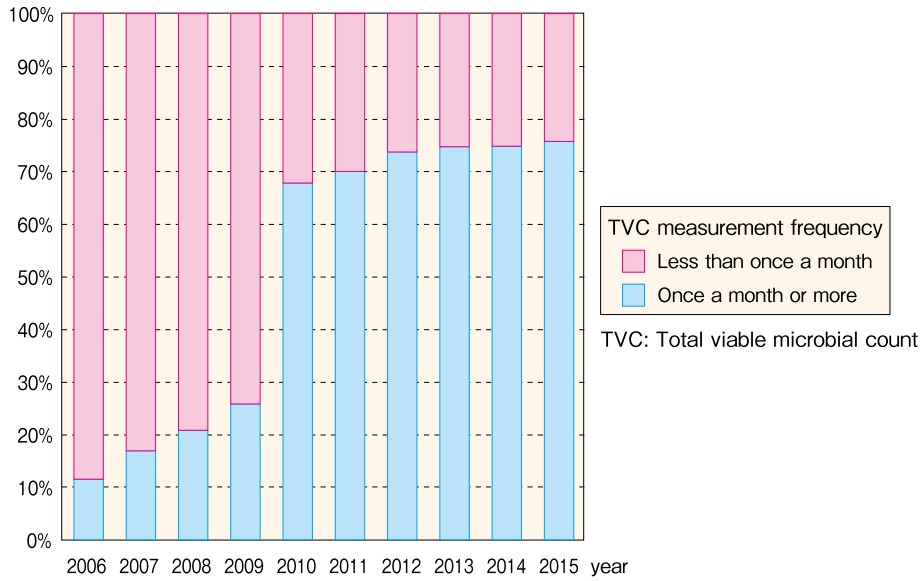

Fig. 24 Facility distribution, by TVC measurement frequency, 2006–2015. Abbreviation: TVC, total viable microbial count

Table 22). The data for dialysis fluid ET concentrations were obtained from 4109 facilities (95.5%). Among them, 3268 facilities (79.5%) attained ET concentration of the < 0.001 EU/mL guaranteed by UPD and 3986 facilities (97.1%) reached ET < 0.050 EU/mL guaranteed by standard dialysis fluid (Fig. 19, Table 22). As for the changes over time in dialysis fluid ET concentration testing frequency, the results were 33.1% in 2008 when water quality standards were enacted [11], which then stepped up to 70.6% in 2010 when water quality management has started being reimbursed and thereafter has gradually increased [8] (Fig. 20, Table 23). Regarding annual changes in dialysis fluid ET concentration, both the level guaranteed by UPD and the level guaranteed by standard dialysis fluid have changed over time (Fig. 21, Table 24). The decrease in dialysis fluid ET concentration in 2008 is due to the switch in dialysis fluid ET concentration units from EU/L to EU/mL based on international rules, and many incorrect entries were found.

Dialysis fluid viable microbial testing

Dialysis fluid viable microbial testing was performed by TVC, the number of colonies after the 7-day cultivation at 17 to 23 °C using a heterotrophic agar plate medium [9]. A total of 4212 facilities (97.9%) responded with their dialysis fluid TVC assay frequency, which included 3189 facilities (75.7%) satisfying the once monthly or more rule in the JSDT standard (Fig. 22, Table 25). A total of 3966 facilities (92.2%) responded with their dialysis fluid TVC, with 2905 facilities (73.2%) reaching the < 0.1 cfu/mL guaranteed by the UPD and 3940 facilities (99.4%) reaching the < 100 cfu/mL guaranteed by the standard dialysis fluid (Fig. 23, Table 25).

Table 26 Facility distribution, by TVC measurement frequency, 2006–2015

Frequency of measurement (per month)	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
1 ≤ (%)	371 (11.5)	580 (16.9)	751 (20.8)	934 (25.8)	2649 (67.8)	2794 (70.0)	3018 (73.7)	3091 (74.7)	3148 (74.8)	3189 (75.7)
< 1 (%)	2857 (88.5)	2861 (83.1)	2856 (79.2)	2693 (74.2)	1260 (32.2)	1196 (30.0)	1077 (26.3)	1046 (25.3)	1059 (25.2)	1023 (24.3)
Subtotal (%)	3228 (100.0)	3441 (100.0)	3607 (100.0)	3627 (100.0)	3909 (100.0)	3990 (100.0)	4095 (100.0)	4137 (100.0)	4207 (100.0)	4212 (100.0)
Unspecified	386	412	418	367	158	159	100	94	90	84
No information available	371	199	56	56	57	28	8	4	7	7
Total	3985	4052	4081	4050	4124	4177	4203	4235	4304	4303

Abbreviation: *TVC* total viable microbial count
Values in parentheses under each figure represent the percentage relative to the subtotal in each column

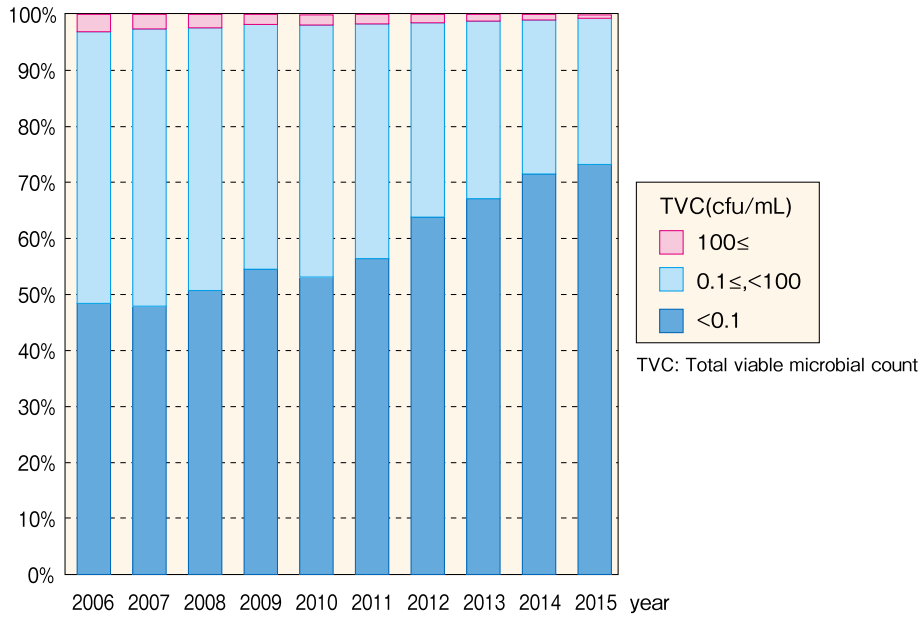

Fig. 25 Facility distribution, by TVC, 2006–2015. Abbreviation: TVC, total viable microbial count

TVC testing frequency increased annually, and although it increased in 2010 similar to the ET assay, its frequency was always slightly lower than ET (Fig. 24, Table 26). The changes over time in dialysis fluid TVC indicated that the level guaranteed by UPD and the level guaranteed by standard dialysis fluid have increased over time, which is similar to dialysis fluid ET concentration (Fig. 25, Table 27).

As described above, the JSDT standard recommend the use of a certified bacterial culture medium such as R2A, TGEA, or one with similar sensitivity [9]. In general, in methods using an agar plate medium, such as R2A or TGEA, a 0.5-mL sample size is the limit to guarantee a 100 cfu/mL standard dialysis fluid. On the other hand, to guarantee the UPD standard of < 0.1 cfu/mL, a minimum of 10 mL or more of dialysis fluid must be sampled and cultured after being strained through a membrane filter. Thus, the JRDR survey examined the sampling volume of dialysis fluid as well as the type of culture medium used. In the 2015 survey, 3879 of 4303 facilities (90.1%) responded regarding the medium for TVC (Fig. 26, Table 28), 56.4% and 30.4% of facilities used R2A and TGEA, respectively. Thus, 86.8% of facilities satisfied quality standards. Of 4303 facilities, 3986 (92.6%) responded regarding the sampling volume. In the 2015 survey, 79.2% of facilities sampled 10 mL or more dialysis fluid for the UPD guarantee (Fig. 27, Table 28). The trend of the types of medium used for TVC indicates that the numbers of facilities using

Table 27 Facility distribution, by TVC, 2006–2015

TVC (cfu/mL)	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
< 0.1 (%)	508 (48.4)	750 (47.9)	915 (50.7)	1123 (54.5)	1819 (53.1)	2017 (56.4)	2397 (63.8)	2570 (67.1)	2811 (71.5)	2905 (73.2)
0.1 ≤, < 100 (%)	509 (48.5)	775 (49.5)	847 (46.9)	901 (43.7)	1542 (45.0)	1498 (41.9)	1305 (34.7)	1214 (31.7)	1079 (27.5)	1037 (26.1)
100 ≤ (%)	32 (3.1)	40 (2.6)	43 (2.4)	38 (1.8)	62 (1.8)	62 (1.7)	55 (1.5)	46 (1.2)	40 (1.0)	24 (0.6)
Subtotal (%)	1049 (100.0)	1565 (100.0)	1805 (100.0)	2062 (100.0)	3423 (100.0)	3577 (100.0)	3757 (100.0)	3830 (100.0)	3930 (100.0)	3966 (100.0)
Unspecified	2036	552	575	494	216	227	320	273	264	227
No information available	900	1935	1701	1494	485	373	126	132	110	110
Total	3985	4052	4081	4050	4124	4177	4203	4235	4304	4303

Abbreviation: *TVC* total viable microbial count
Values in parentheses under each figure represent the percentage relative to the subtotal in each column

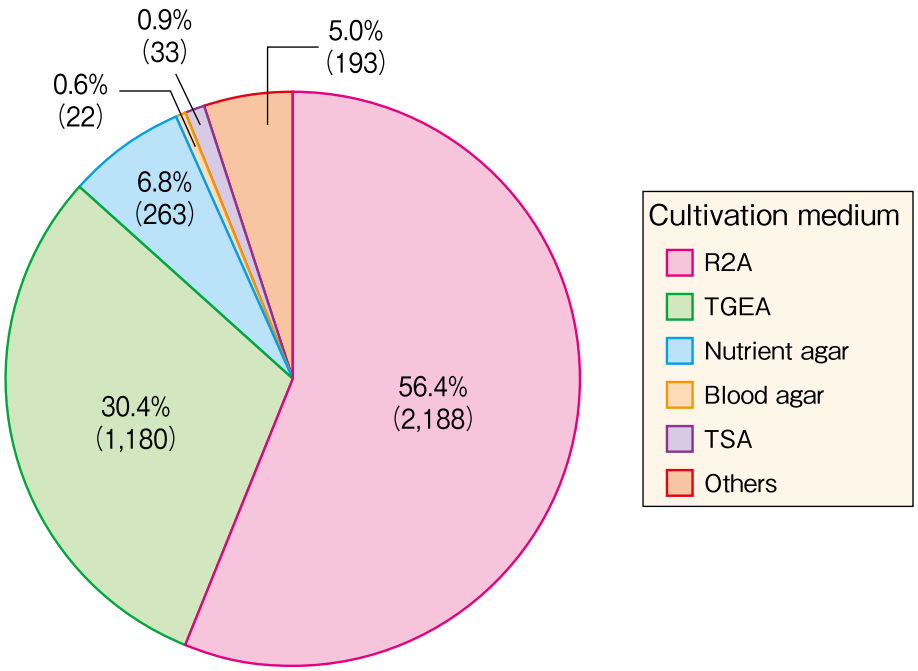

Fig. 26 Facility distribution, by cultivation medium, 2015. (1). R2A, Reasoner's No. 2 agar. (2) TGEA, tryptone glucose extract agar. (3) TSA, trypticase soy agar

TEGA are increasing, while the facilities using R2A are decreasing. In total, an overall increase in satisfying the standard has been observed (Fig. 28, Table 29). The sampling volume for TVC assay guaranteeing UPD has been gradually increasing (Fig. 29, Table 30).

Present status of ETRF installation

Installation of an ETRF is indispensable for maintaining dialysis fluid quality within UPD level, and JSDT established the standard for the management of ETRF [12]. Of 4303 facilities with one or more bedside consoles, 4294 facilities (99.8%) responded

Table 28 Facility distribution on TVC measurement, by cultivation medium and sampling volume, 2015

Sampling volume	R2A	TGEA	Nutrient agar	Blood agar	TSA	Others	Subtotal	Unspecified	No information available	Total
< 1 (%)	166 (58.7)	37 (13.1)	63 (22.3)	2 (0.7)	6 (2.1)	9 (3.2)	283 (100.0)	20	1	304
1 ≤, < 10 (%)	354 (73.8)	32 (6.7)	60 (12.5)	9 (1.9)	3 (0.6)	22 (4.6)	480 (100.0)	44		524
10 ≤, < 50 (%)	649 (55.0)	363 (30.8)	83 (7.0)	7 (0.6)	5 (0.4)	72 (6.1)	1179 (100.0)	31		1210
50 ≤, < 100 (%)	721 (50.2)	591 (41.2)	38 (2.6)	3 (0.2)	16 (1.1)	66 (4.6)	1435 (100.0)	18		1453
100 ≤, < 500 (%)	272 (59.6)	145 (31.8)	12 (2.6)	1 (0.2)	3 (0.7)	23 (5.0)	456 (100.0)	5		461
500 ≤, < 1000 (%)	11 (68.8)	5 (31.3)					16 (100.0)			16
1000 ≤, < 10,000 (%)	8 (50.0)	6 (37.5)	1 (6.3)			1 (6.3)	16 (100.0)			16
10,000 ≤ (%)	1 (50.0)	1 (50.0)					2 (100.0)			2
Subtotal (%)	2182 (56.4)	1180 (30.5)	257 (6.6)	22 (0.6)	33 (0.9)	193 (5.0)	3867 (100.0)	118	1	3986
Unspecified (%)	5 (45.5)		6 (54.5)				11 (100.0)	195	1	207
No information available (%)	1 (100.0)						1 (100.0)		109	110
Total (%)	2188 (56.4)	1180 (30.4)	263 (6.8)	22 (0.6)	33 (0.9)	193 (5.0)	3879 (100.0)	313	111	4303

Values in parentheses under each figure represent the percentage relative to the subtotal in each row

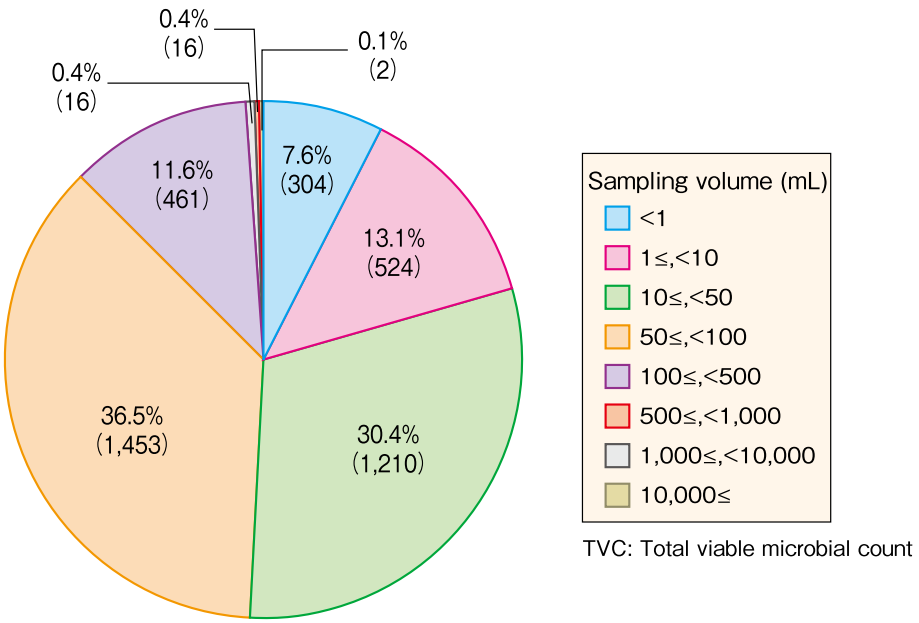

Fig. 27 Facility distribution, by sampling volume for TVC measurement, 2015. Abbreviation: TVC, total viable microbial count

regarding ETRF installation. Among them, 4172 facilities (97.2%) installed ETRF in one or more bedside consoles (Table 31). Of 133,538 bedside consoles in 4303 facilities, 121,014 consoles (90.6%) had an ETRF installed (Table 32). The usage of ETRF at sampling has strong impacts on the results of ET concentration and TVC. The percentages of the facilities satisfying UPD standard in "Use" of ETRF were higher than those in "None-use" (Figs. 30 and 31, Tables 33 and 34). One process of ETRF can theoretically attain the UPD standard of both ET concentration and TVC, unless the contamination of dialysis fluid immediately before ETRF is extremely severe. However, even when an ETRF was installed,

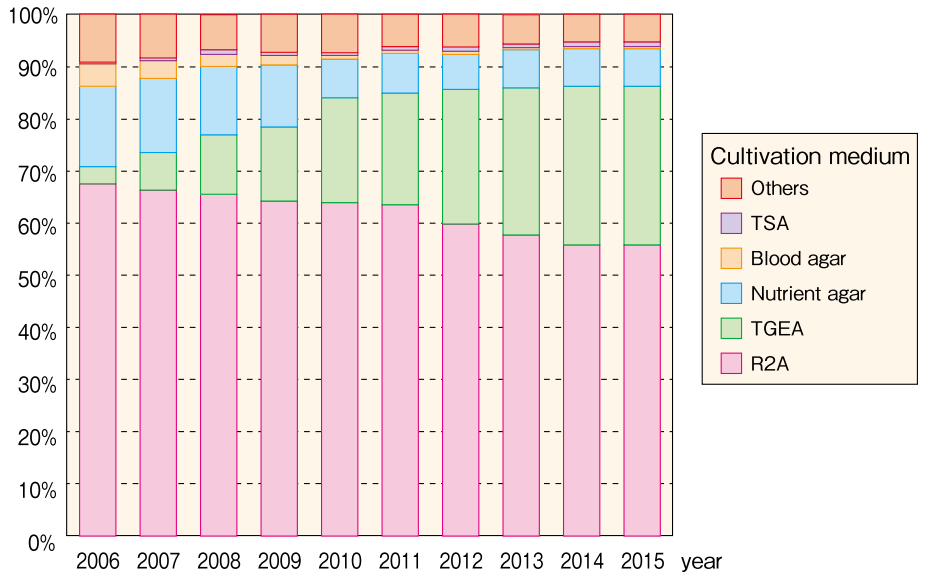

Fig. 28 Facility distribution, by cultivation medium, 2006–2015. (1) R2A, Reasoner's No. 2 agar. (2) TGEA, tryptone glucose extract agar. (3) TSA, trypticase soy agar

Table 29 Facility distribution, by cultivation medium, 2006–2015

Cultivation medium	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
R2A (%)	746 (67.5)	1028 (66.3)	1175 (65.5)	1324 (64.2)	2130 (63.9)	2213 (63.5)	2193 (59.8)	2148 (57.7)	2142 (55.8)	2188 (56.4)
TGEA (%)	36 (3.3)	111 (7.2)	205 (11.4)	292 (14.2)	669 (20.1)	745 (21.4)	944 (25.8)	1051 (28.2)	1169 (30.4)	1180 (30.4)
Nutrient agar (%)	170 (15.4)	220 (14.2)	235 (13.1)	246 (11.9)	246 (7.4)	266 (7.6)	244 (6.7)	273 (7.3)	275 (7.2)	263 (6.8)
Blood agar (%)	48 (4.3)	52 (3.4)	42 (2.3)	37 (1.8)	23 (0.7)	22 (0.6)	21 (0.6)	15 (0.4)	15 (0.4)	22 (0.6)
TSA (%)	4 (0.4)	9 (0.6)	16 (0.9)	12 (0.6)	19 (0.6)	23 (0.7)	32 (0.9)	27 (0.7)	36 (0.9)	33 (0.9)
Others (%)	102 (9.2)	131 (8.4)	120 (6.7)	150 (7.3)	246 (7.4)	217 (6.2)	231 (6.3)	210 (5.6)	203 (5.3)	193 (5.0)
Subtotal (%)	1106 (100.0)	1551 (100.0)	1793 (100.0)	2061 (100.0)	3333 (100.0)	3486 (100.0)	3665 (100.0)	3724 (100.0)	3840 (100.0)	3879 (100.0)
Unspecified	2023	1720	1622	1448	584	531	411	375	353	313
No information available	856	781	666	541	207	160	127	136	111	111
Total	3985	4052	4081	4050	4124	4177	4203	4235	4304	4303

Values in parentheses under each figure represent the percentage relative to the total in each column
R2A Reasoner's No. 2 agar, *TGEA* tryptone glucose extract agar, *TSA* trypticase soy agar

neither a 19.1% ET concentration nor a 24.8% TVC satisfied the UPD standard. These results suggest that the spread of ETRF has contributed to the improvement of dialysis fluid quality and that there are issues in the handling of ETRF to achieve UPD [12].

Overall dialysis fluid quality

The JSDT standard requires facilities to satisfy both dialysis fluid ET concentration and TVC simultaneously within UPD or dialysis fluid standard, in order to maintain the microbiological quality of dialysis fluid [9]. Of 4303 facilities, 3959 (92.0%) responded about both their dialysis fluid ET concentration and TVC. These included 2704 facilities (68.3%) that achieved UPD and 3833 facilities (96.8%) that achieved a standard dialysis fluid (Fig. 32, Table 35). Figure 33 shows the annual changes in the achievement rate of UPD and standard dialysis fluid computed from facilities that responded with both ET concentration and TVC, which has improved since 2009 (Fig. 33, Table 36).

Chapter 3: Current status of HDF

HDF patient dynamics

Hemodiafiltration (HDF) includes several variations as online HDF, offline HDF, push/pull HDF, acetate-free biofiltration (AFBF), and intermittent infusion

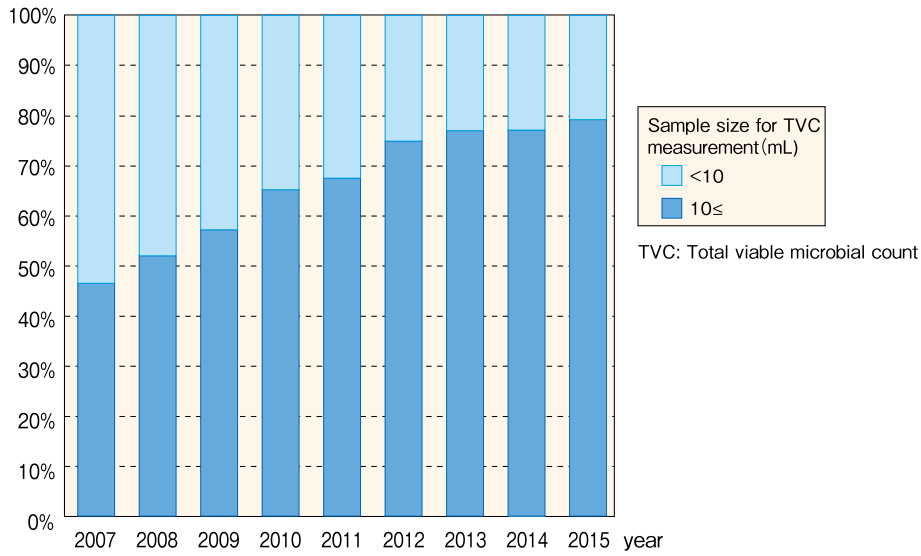

Fig. 29 Facility distribution, by sample volume for TVC measurement, 2006–2015. Abbreviation: TVC, total viable microbial count

Table 30 Facility distribution, by sampling volume for TVC measurement, 2006–2015

Sampling volume	2007	2008	2009	2010	2011	2012	2013	2014	2015
< 10 (%)	886 (53.5)	911 (48.0)	921 (42.8)	1208 (34.8)	1176 (32.5)	948 (25.1)	885 (23.0)	905 (22.9)	828 (20.8)
10 ≤ (%)	771 (46.5)	987 (52.0)	1229 (57.2)	2262 (65.2)	2440 (67.5)	2827 (74.9)	2969 (77.0)	3045 (77.1)	3158 (79.2)
Subtotal (%)	1657 (100.0)	1898 (100.0)	2150 (100.0)	3470 (100.0)	3616 (100.0)	3775 (100.0)	3854 (100.0)	3950 (100.0)	3986 (100.0)
Unspecified	1603	1519	1362	452	405	303	250	244	207
No information available	792	664	538	202	156	125	131	110	110
Total	4052	4081	4050	4124	4177	4203	4235	4304	4303

Values in parentheses under each figure represent the percentage relative to the total in each column

hemodiafiltration (IHDF). The patients treated by HDF in Japan rapidly increased year by year and reached 53,776 by the end of 2015, accounting for 17.8% of all HD/HDF patients (Fig. 34, Table 37). Of 53,776 HDF patients, 34,316 (63.8%) were males and 19,460 (36.2%) were females (Fig. 35, Table 38). The mean age was 64.8 years for males and 66.9 years for females; the age category with the greatest percentage being ages 65 to 69 years. These distributions and trends resembled those of HD patients (Fig. 3), and HDF therapy was being performed for various ages. Concerning the main primary disease in HDF patients, diabetic nephropathy and chronic glomerulonephritis accounted for 34.1 and 35.2%, respectively. Comparing HD patients, the percentage of diabetic nephropathy was low, and the percentage of chronic glomerulonephritis was high (Fig. 36, Table 39). The distribution of dialysis vintages was largely the same as that for HD patients (Fig. 6) (Fig. 37, Table 40). Males tended to be more numerous in each age category, although the number of male and female patients was largely the same for dialysis vintages of 25 years or longer.

Types and annual changes of HDF treatment modality

The most numerous HDF patients were online HDF patients at 44,527 persons (82.8% of HDF patients). Most of all HDF patients were for offline HDF before 2011, but the majority became online HDF since 2012 and has significantly increased (Fig. 34, Table 37). In contrast, the number of offline HDF patients has been decreasing year by year. IHDF was added to survey items from 2015 and has been identified as accounting for 6.6% of all HDF. The percentage of HDF therapy, both online and offline, increased as dialysis vintage lengthened, and the percentage of HD showed a decreasing trend (Fig. 38, Table 41). IHDF represented about 1% of all treatment modalities throughout all groups. Other than that, the percentage of PD decreased as dialysis vintage lengthened, whereas hemoadsorption dialysis showed a trend wherein its percentage increased by the same degree that dialysis vintage lengthened.

Table 31 Facility counts, by ETRF installation, 2015

	With ETRF	Without ETRF	Subtotal	No information available	Total
Number of facilities (%)	4172 (97.2)	122 (2.8)	4294 (100.0)	9	4303

Values in parentheses under each figure represent the percentage relative to the subtotal in the row

HDF prescriptions

Regarding the dilution method, most of online HDF involved pre-dilution, whereas offline HDF and AFBF mostly involved post-dilution (Fig. 39, Table 42). HDF dialysis prescriptions were illustrated four ways: by method (online, offline) × by dilution method (pre-dilution, post-dilution). The combination with the largest number of patients was online/pre-dilution with 35,994 persons, and the smallest was offline/pre-dilution with 484 persons. First, comparing the blood flow rate that for online HDF tended to be higher than that for offline HDF, and no clear difference was found between pre- and post-dilution (Fig. 40, Table 43). The blood flow rate for the online HDF/pre-dilution combination was the highest, with a mean of 229 mL/min. Fifty percent of more patients were found to have a blood flow rate of 220 mL/min or higher, whereas 8.8% had a blood flow rate of 300 mL/min or higher. There was no clear difference between the combinations in terms of dialysis time (Fig. 41, Table 44).

The online HDF/pre-dilution combination had the highest substitution volume, with a mean of 40.1 L (per session), whereas online/post-dilution combination had 10.0 L (Fig. 42, Table 45). Offline HDF had substitution volumes of 10.6 and 8.1 L with pre-dilution and post-dilution, respectively. On about the annual changes in substitution volume, the number of patients with online HDF/pre-dilution tended to increase yearly, although no changes in the substitution volume were observed (Fig. 43, Table 46). Online

Table 32 Bedside console counts, by ETRF installation, 2015

Numbers of bedside consoles	Facility status of ETRF installation		Subtotal	No information available	Total
	More than one bedside console with ETRF in the facility	No bedside consoles with ETRF in the facility			
Number of bedside consoles with ETRF (%)	121,014 (100.0)	0 (0.0)	121,014 (100.0)	0	121,014
Number of bedside consoles without ETRF (%)	10,008 (81.4)	2286 (18.6)	12,294 (100.0)	230	12,524
Total (%)	131,022 (98.3)	2286 (1.7)	133,308 (100.0)	230	133,538

Values in parentheses under each figure represent the percentage relative to the subtotal in each row
ETRF endotoxin retentive filter

HDF/post-dilution also did not largely change over time. In contrast, the number of offline HDF/pre-dilution patients decreased in 2015, although the substitution volume showed a slight increasing trend yearly. The number of patients with offline HDF/post-dilution tended to decrease, but the substitution volume slightly increased.

Urea kinetics, nutrition, and inflammation in HDF patients

Urea kinetics, nutritional, and inflammation status were compared between HD and HDF patients (by each dilution method). When we compared urea kinetics using single pool Kt/V urea (Kt/Vsp), the Kt/Vsp for online HDF/pre- and post-dilution and offline HDF/post-dilution combinations tended to be higher than that for HD. Offline HDF/pre-dilution Kt/Vsp was largely the same as for HD (Fig. 44, Table 47). Subsequently, we compared normalized protein catabolic rate (nPCR), serum albumin concentration, creatinine concentration, and % creatinine generation rate (%CGR) as an evaluation of nutritional status. No clear difference was found between HDF and HD for nPCR and albumin concentration. Creatinine concentration was higher for online HDF/pre- and post-dilution than with HD, and largely the same as with HD for offline HDF/pre- and post-dilution. %CGR was higher for online HDF/pre- and post-dilution than for HD (Fig. 45, Table 47).

We compared serum CRP concentration as an inflammation index (Fig. 45, Table 48). Compared with HD, the concentration tended to be low with online HDF/pre-dilution, and showed a high trend with offline HDF/pre- and post-dilution.

Management for anemia and CKD-MBD in HDF patients

We evaluated the management for anemia and CKD-MBD markers in HDF patients compared with HD patients. Hemoglobin concentration showed a slightly high trend with online HDF/pre- and post-dilution. Phosphorus concentration and intact PTH levels for online HDF/pre- and post-dilution were somewhat high compared to HD. Corrected calcium concentration was slightly high with online HDF/post-dilution and offline HDF/pre- and post-dilution (Fig. 45, Table 48).

Chapter 4: Current status of peritoneal dialysis (PD)

PD patient dynamics

There were 9322 PD patients at the end of 2015. The variations of PD therapy were PD only, an combination with HD once weekly, twice weekly, thrice weekly, and some other combinations; and the number of patients in each modality was 7460 persons, 1576 persons, 185 persons, 30 persons, and 71 persons, respectively (Table 49). The total number of PD patients had been gradually decreasing since 2009

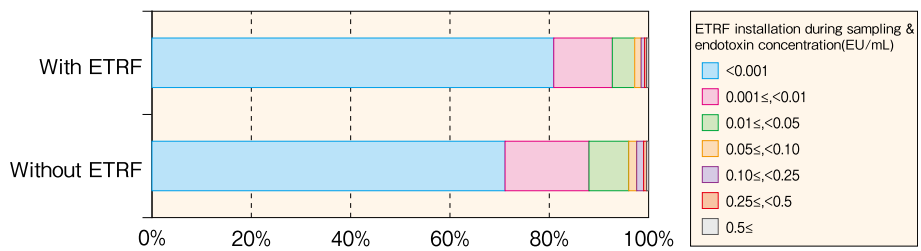

Fig. 30 Facility distribution, by ETRF installation during sampling endotoxin concentration, 2015. Abbreviation: ETRF, endotoxin retentive filter

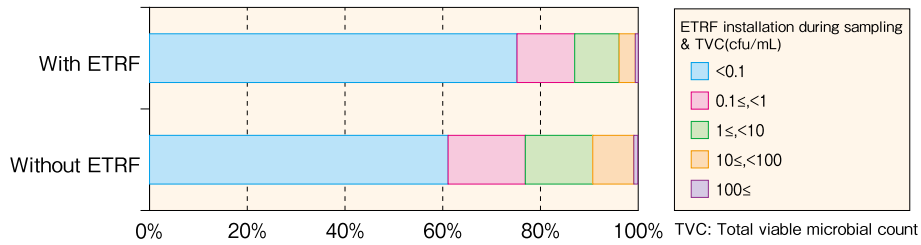

Fig. 31 Facility distribution, by ETRF installation during sampling TVC, 2015. Abbreviation: ETRF, endotoxin retentive filter

(Fig. 46). However, we should understand that a total number of PD patients in JRDR did not always reflect the real number of PD patients in Japan. The JRDR survey only targeted facilities performing HD; hence, PD patients treated at other facilities are not included. We started a survey of the number of incident PD patients since 2015, and have found 2197 patients.

A total of 8846 PD patients responded to patient questionnaires, including 5728 (64.8%) males and 3118 (35.2%) females, with mean ages of 62.8 years and 62.7 years for males and females, respectively. The age distribution showed a normal distribution, peaking with the 65- to 74-year age category, which was the same trend with HD patients (Fig. 3) (Fig. 47, Table 50). The PD vintage distribution showed that less than 2 years accounted for 43.9% of the total and 8.4% were 8 years or longer (Fig. 48, Table 51). Diabetic nephropathy was the primary disease in 31.9% of PD patients, which was very close to the 32.4% for chronic glomerulonephritis. Comparing HD patients, the percentage of diabetic nephropathy showed a lower prevalence (Fig. 49, Table 52).

Present status of PD + HD combined therapy

The percentage of the patients undergoing PD only was 80.3% of the total, the percentages of PD only and PD + HD combined therapy both revealed no changes over time (Fig. 50, Table 53). The percentage of the patients undergoing a combination of PD and HD were increased as PD history got longer (Fig. 51, Table 54). The highest frequency of HD combinations was once weekly, and when PD history reached 8 years or longer, 50% or more of PD patients had a combination with HD.

PD prescriptions

The mean volume of PD fluid per day was 6.71 and 5.98 L for males and females, respectively. The volume was found to decrease as age increased (Fig. 52, Table 55) and increased as PD vintage got longer (Fig. 53, Table 56). When we examined the PD treatment times, there was hardly any difference between sexes with 17.8 and 17.6 h for males and females, respectively, and no clear difference was found by age (Fig. 54, Table 57). In contrast, a trend was found in which PD treatment time became longer as PD vintage got longer. In particular, PD patients receiving 24-h treatment made up 76.3% of the total when PD vintage was 8 years or longer (Fig. 55, Table 58). The percentage of the patients using the automated peritoneal dialysis (APD) was 44.9% of all patients undergoing PD alone (Table 59). As for replacement of PD dialysis fluid, most used bag replacement machines utilizing ultraviolet light (52.4%), followed by those using

Table 33 Facility distribution, by ETRF installation during sampling endotoxin concentration, 2015

With or without ETRF when the dialysate sampled	< 0.001	0.001 ≤, < 0.01	0.01 ≤, < 0.05	0.05 ≤, < 0.1	0.1 ≤, < 0.25	0.25 ≤, < 0.5	0.5 ≤	Subtotal	Unspecified	No information available	Total
With ETRF (%)	2895 (80.9)	421 (11.8)	161 (4.5)	46 (1.3)	25 (0.7)	16 (0.4)	14 (0.4)	3578 (100.0)	28	3	3609
Without ETRF (%)	363 (71.2)	86 (16.9)	41 (8.0)	8 (1.6)	7 (1.4)	3 (0.6)	2 (0.4)	510 (100.0)	54	27	591
Subtotal (%)	3258 (79.7)	507 (100.0)	202 (100.0)	54 (100.0)	32 (100.0)	19 (100.0)	16 (100.0)	4088 (100.0)	82	30	4200
Unspecified (%)	10 (47.6)	2 (9.5)	7 (33.3)	1 (4.8)	1 (4.8)	(0.0)	(0.0)	21 (100.0)	48	7	76
No information available (%)									1	26	27
Total (%)	3268 (79.5)	509 (12.4)	209 (5.1)	55 (1.3)	33 (0.8)	19 (0.5)	16 (0.4)	4109 (100.0)	131	63	4303

Values in parentheses under each figure represent the percentage relative to the subtotal in each column
ETRF endotoxin retentive filter

Table 34 Facility distribution, by ETRF installation during sampling and TVC, 2015

With or without ETRF when the dialysate sampled	< 0.1	0.1 ≤, < 1	1 ≤, < 10	10 ≤, < 100	100 ≤	Subtotal	Unspecified	No information available	Total
With ETRF (%)	2600 (75.2)	407 (11.8)	316 (9.1)	115 (3.3)	20 (0.6)	3458 (100.0)	113	38	3609
Without ETRF (%)	297 (61.1)	77 (15.8)	67 (13.8)	41 (8.4)	4 (0.8)	486 (100.0)	67	38	591
Subtotal (%)	2897 (73.5)	484 (12.3)	383 (9.7)	156 (4.0)	24 (0.6)	3944 (100.0)	180	76	4200
Unspecified	8 (36.4)	5 (22.7)	4 (18.2)	5 (22.7)	(0.0)	22 (100.0)	46	8	76
No information available							1	26	27
Total	2905 (73.2)	489 (12.3)	387 (9.8)	161 (4.1)	24 (0.6)	3966 (100.0)	227	110	4303

Values in parentheses under each figure represent the percentage relative to the subtotal in each column
ETRF endotoxin retentive filter, *TVC* total viable microbial count

completely manual methods (30.2%), and those using thermal sterile connecting devices (14.8%) (Table 60).

Residual kidney function (urine volume and residual kidney Kt/V)

We evaluated the residual kidney function in patients undergoing PD alone by urine volume and residual kidney Kt/V. The mean urine volume per day was 774 and 643 mL for men and women, respectively; thus, a higher tendency was found among males (Fig. 56, Table 61). The difference was unclear for age, but as PD vintage got longer, urine volume showed a decreasing trend. When PD vintage was 8 years or longer, 55.2% had a urine volume < 100 mL (Fig. 57, Table 62). The mean residual kidney Kt/V was 0.68 and 0.64 for males and females, respectively (Fig. 58, Table 63). The difference was unclear for age, but the residual kidney Kt/V also showed a decreasing trend as PD vintage got longer similar to urine volume. Particularly, we found 89.4% to have a residual kidney Kt/V < 0.4 if PD vintage was 8 years or longer (Fig. 59, Table 64).

Peritoneal function (ultrafiltration volume and PD Kt/V)

We evaluated peritoneal function in patients undergoing PD alone by fluid removal volume and PD Kt/V. Mean ultrafiltration volume was 641 and 628 mL for males and females, respectively (Fig. 60, Table 65). The difference was unclear for age, but ultrafiltration volume showed an increasing trend as PD vintage got longer (Fig. 61, Table 66). In patients with a PD vintage of 8 years or longer, 55.6% had an ultrafiltration volume of 800 mL or more. The mean PD Kt/V was 1.20 and 1.37 for males and females, respectively; thus, we found a high trend in females (Fig. 62, Table 67). In terms of age, the < 45 years category was somewhat higher than other age categories. PD Kt/V also showed an increasing trend as PD vintage got longer. We found that 61.1% had a PD Kt/V of

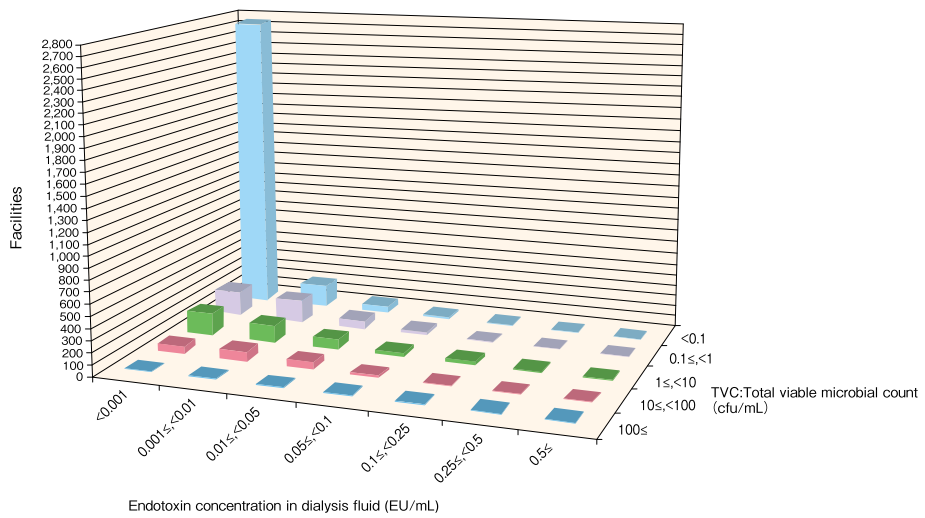

Fig. 32 Facility distribution, by TVC and endotoxin concentration, 2015. Abbreviation: TVC, total viable microbial count

Table 35 Facility distribution, by TVC and endotoxin concentration, 2015

Bacterial counts in dialysate (cfu/mL)	< 0.001	0.001 ≤, < 0.01	0.01 ≤, < 0.05	0.05 ≤, < 0.1	0.1 ≤, < 0.25	0.25 ≤, < 0.5	0.5 ≤	Subtotal	Unspecified	No information available	Total
< 0.1	2704	144	37	8	4	4	2	2903	2		2905
0.1 ≤, < 1	269	155	44	9	3	4	2	486	3		489
1 ≤, < 10	160	128	59	19	15	3	1	385	1	1	387
10 ≤, < 100	41	51	41	14	5	4	5	161			161
100 ≤	7	5	5		2	2	3	24			24
Subtotal	3181	483	186	50	29	17	13	3959	6	1	3966
Unspecified	61	18	15	3	3	1	2	103	123	1	227
No information available	26	8	8	2	1	1	1	47	2	61	110
Total	3268	509	209	55	33	19	16	4109	131	63	4303

TVC total viable microbial count

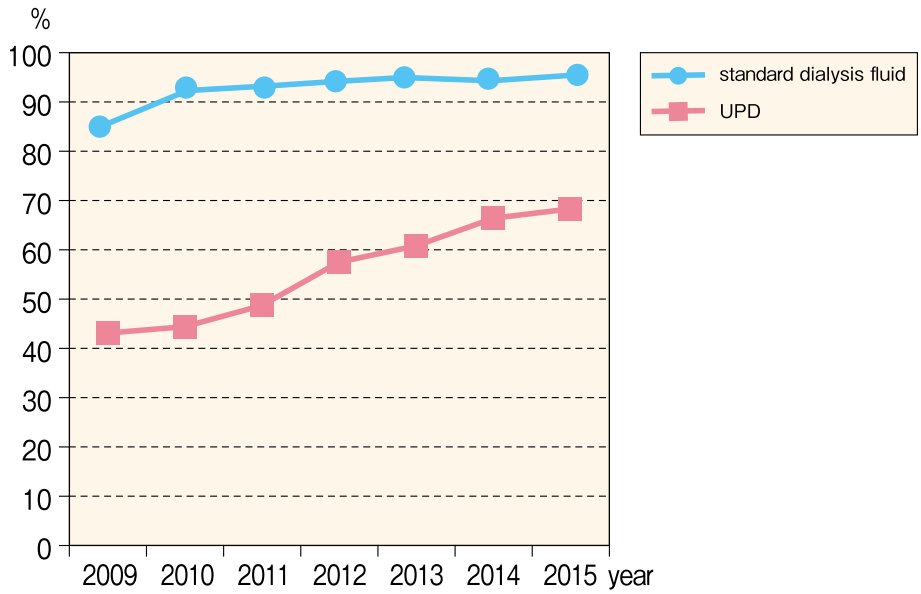

Fig. 33 Facility distribution, in achievement of UPD and standard dialysis fluid, 2009–2015. Abbreviation: UPD, ultrapure dialysis fluid

Table 36 Facility distribution, in achievement of UPD and standard dialysis fluid, 2009–2015

	2009	2010	2011	2012	2013	2014	2015
The facilities with both ET < 0.001 EU/ml and TVC < 0.1 cfu/mL (%)	866 (43.1)	1512 (44.4)	1735 (48.7)	2152 (57.5)	2325 (60.8)	2602 (66.4)	2704 (68.3)
The facilities with both ET < 0.05 EU/mL and TVC < 100 cfu/mL (%)	1725 (85.9)	3124 (91.8)	3307 (92.8)	3525 (94.2)	3624 (94.8)	3753 (95.8)	3833 (96.8)

cfu colony forming unit, *ET* endotoxin concentration, *EU* endotoxin unit, *TVC* total viable microbial count, *UPD* ultrapure dialysis fluid

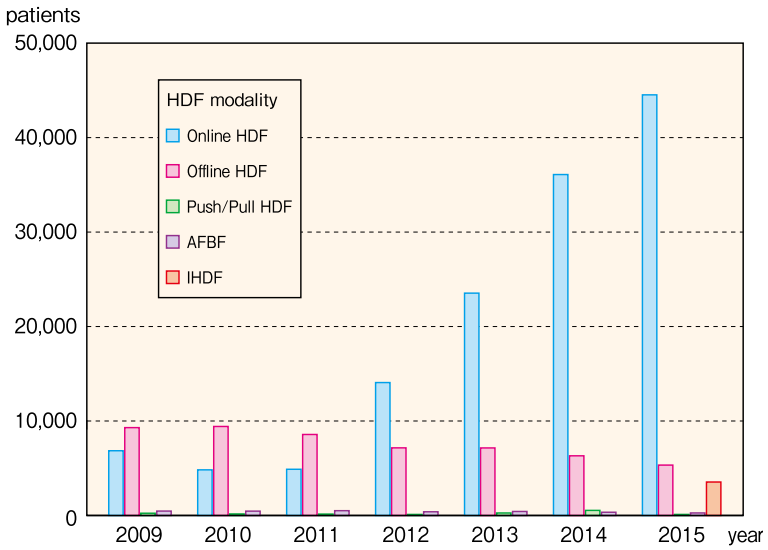

Fig. 34 Prevalent dialysis patient distribution, by HDF modality, 2009–2015. Abbreviations: HDF, hemodiafiltration; AFBF, acetate-free biofiltration; IHDF, intermittent infusion hemodiafiltration

Table 37 Prevalent patient distribution, by HDF modality, 2009–2015

Dialysis modality	2009	2010	2011	2012	2013	2014	2015
Facility HD	253,807	262,973	270,072	268,275	264,211	255,641	248,725
Online HDF (%)	6852 (40.7)	4829 (32.5)	4890 (34.6)	14,069 (64.8)	23,536 (75.0)	36,090 (83.4)	44,527 (82.8)
Offline HDF (%)	9299 (55.2)	9421 (63.4)	8573 (60.7)	7157 (32.9)	7149 (22.8)	6315 (14.6)	5332 (9.9)
Push/Pull HDF (%)	237 (1.4)	159 (1.1)	145 (1.0)	109 (0.5)	263 (0.8)	537 (1.2)	110 (0.2)
AFBF (%)	465 (2.8)	458 (3.1)	507 (3.6)	390 (1.8)	423 (1.3)	341 (0.8)	267 (0.5)
IHDF (%)							3540 (6.6)
HDF subtotal (%)	16,853 (100.0)	14,867 (100.0)	14,115 (100.0)	21,725 (100.0)	31,371 (100.0)	43,283 (100.0)	53,776 (100.0)
HD·HDF total	270,660	277,840	284,187	290,000	295,582	298,924	302,501

Values in parentheses under each figure represent the percentage relative to the HDF subtotal in each column
Values in parentheses under each figure represent the percentage relative to the total in each column
HD hemodialysis, *HDF* hemodiafiltration

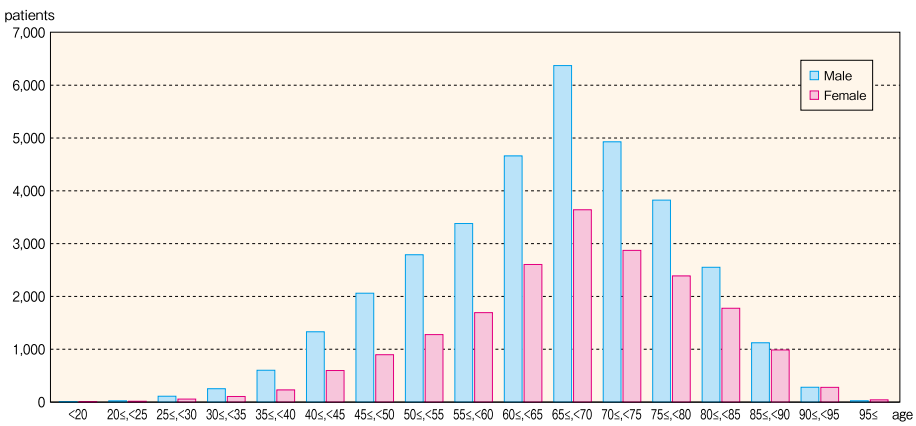

Fig. 35 HDF patient distribution, by age and sex, 2015

Table 38 HDF patient distribution, by age and sex, 2015

Sex	< 10	10 ≤, < 15	15 ≤, < 20	20 ≤, < 25	25 ≤, < 30	30 ≤, < 35	35 ≤, < 40	40 ≤, < 45	45 ≤, < 50	50 ≤, < 55	55 ≤, < 60	60 ≤, < 65	65 ≤, < 70	70 ≤, < 75	75 ≤, < 80	80 ≤, < 85	85 ≤, < 90	90 ≤, < 95	95 ≤	Subtotal	No information available	Total	Mean age	S.D.
Male (%)		1 (0.0)	7 (0.0)	21 (0.1)	110 (0.3)	252 (0.7)	602 (1.8)	1330 (3.9)	2061 (6.0)	2789 (8.1)	3381 (9.9)	4661 (13.6)	6372 (18.6)	4928 (14.4)	3824 (11.1)	2552 (7.4)	1122 (3.3)	280 (0.8)	23 (0.1)	34,316 (100.0)		34,316	64.81	12.47
Female (%)			5 (0.0)	15 (0.1)	56 (0.3)	105 (0.5)	229 (1.2)	597 (3.1)	896 (4.6)	1277 (6.6)	1693 (8.7)	2605 (13.4)	3641 (18.7)	2872 (14.8)	2388 (12.3)	1776 (9.1)	986 (5.1)	278 (1.4)	41 (0.2)	19,460 (100.0)		19,460	66.86	12.41
Subtotal (%)		1 (0.0)	12 (0.0)	36 (0.1)	166 (0.3)	357 (0.7)	831 (1.5)	1927 (3.6)	2957 (5.5)	4066 (7.6)	5074 (9.4)	7266 (13.5)	10,013 (18.6)	7800 (14.5)	6212 (11.6)	4328 (8.0)	2108 (3.9)	558 (1.0)	64 (0.1)	53,776 (100.0)		53,776	65.55	12.48
No information available																							0	0
Total (%)		1 (0.0)	12 (0.0)	36 (0.1)	166 (0.3)	357 (0.7)	831 (1.5)	1927 (3.6)	2957 (5.5)	4066 (7.6)	5074 (9.4)	7266 (13.5)	10,013 (18.6)	7800 (14.5)	6212 (11.6)	4328 (8.0)	2108 (3.9)	558 (1.0)	64 (0.1)	53,776 (100.0)		53,776	65.55	12.48

Values in parentheses under each figure represent the percentage relative to the subtotal in each row

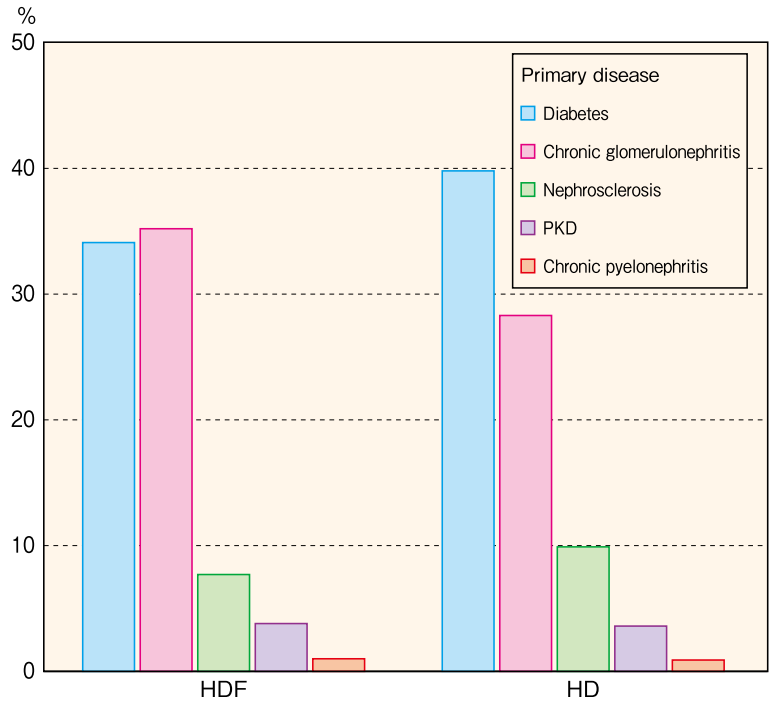

Fig. 36 Dialysis patient distribution, by HDF/HD and primary disease, 2015. Abbreviation: PKD, polycystic kidney disease

1.6 or more if PD vintage was 8 years or longer (Fig. 63, Table 68).

PET and D/P Cr ratio

The testing rate for peritoneal equilibration test (PET) in patients undergoing PD alone was 45.3% and that for Fast PET only was 20.1%, and the untested rate was 34.6% (Table 69). The mean (dialysate/plasma creatinine) D/P Cr ratio was 0.68 and 0.64 for males and females, respectively, and thus was slightly high among males (Fig. 64, Table 70). D/P Cr ratio showed an increasing trend as age increased. Almost no consistent trend was seen in D/P Cr ratio by PD vintage, but the ratio was 0.64 if PD vintage was 6 years or longer, and the ratio decreased slightly to 0.62 if it was 8 years or longer (Fig. 65, Table 71). Concerning the D/P Cr ratio by primary disease, it was highest at 0.70 with diabetic nephropathy, followed by 0.68 with nephrosclerosis (Fig. 66, Table 72).

ESI and peritonitis

The patient rate of exit-site infection (ESI) or peritonitis onset was evaluated as the following formula in patients undergoing PD alone. ESI was found in 20.2% of PD patients who responded, and peritonitis was seen in 14.4%. The overall patient ESI incidence rate was 0.40 counts per patient year, and the peritonitis incidence rate was 0.24. (Fig. 67, Table 73).

ESI incidence rate (counts/person/year) = ESI episodes in 2015 in all subjects ÷ total months on PD in 2015 in all patients × 12

Peritonitis incidence rate (counts/person/year) = peritonitis episodes in 2015 in all subjects ÷ total months on PD in 2015 in all patients × 12

The peritonitis incidence rate in male PD patients was 0.27, slightly greater than the 0.20 in females. We found an increasing trend in the incidence rate of the older age group (Figs. 68 and 69, Tables 74 and 75). In addition, no consistent trend was found between peritonitis onset and PD vintage (Fig. 70, Table 76). As for primary disease, the peritonitis incidence rate was high in nephrosclerosis (0.26) and diabetic nephropathy (0.27) (Fig. 71, Table 77).

History of EPS

The history of encapsulating peritoneal sclerosis (EPS) was observed in 678 (5.2%) patients out of 13,033 patients who were currently undergoing PD or had once underwent PD. This included 86.6% with a history of steroid administration and 79.5% with a history of surgical treatment (Table 78). The breakdown of these 678 patients was 413 males (60.9%) and 265 females (39.1%) (Fig. 72, Table 79). The age distribution largely

Table 39 Dialysis patient distribution, by HDF/HD and primary disease, 2015

Primary disease	HDF (%)		HD (%)	
Chronic glomerulonephritis	18,937	(35.2)	70,315	(28.3)
Chronic pyelonephritis	533	(1.0)	2272	(0.9)
RPGN	382	(0.7)	2025	(0.8)
PIH	427	(0.8)	1052	(0.4)
Unclassified nephritis	278	(0.5)	1031	(0.4)
PKD	2055	(3.8)	8869	(3.6)
Nephrosclerosis	4159	(7.7)	24,511	(9.9)
Hypertensive emergencies	432	(0.8)	2070	(0.8)
Diabetes	18,332	(34.1)	98,975	(39.8)
Lupus nephritis	457	(0.8)	1702	(0.7)
Amyloidosis	87	(0.2)	358	(0.1)
Gout	181	(0.3)	853	(0.3)
Inborn errors of metabolism	54	(0.1)	201	(0.1)
Tuberculosis	33	(0.1)	153	(0.1)
Urolithiasis	86	(0.2)	471	(0.2)
Neoplasm of kidney and urinary tract	133	(0.2)	763	(0.3)
Urinary tract obstruction	114	(0.2)	589	(0.2)
Myeloma	36	(0.1)	247	(0.1)
Hypoplastic kidney	143	(0.3)	439	(0.2)
Undetermined	5108	(9.5)	23,795	(9.6)
Rejected kidney	526	(1.0)	1559	(0.6)
Others	1275	(2.4)	6462	(2.6)
Subtotal	53,768	(100.0)	248,712	(100.0)
No information available	8		13	
Total	53,776		248,725	

Values in parentheses under each figure represent the percentage relative to the total in each column

resembled that for all PD patients (Fig. 47). In terms of relationship to dialysis vintage, 494 patients (72.9%) had a vintage of 8 years or longer, and the incidence rate was significantly high in this category (Fig. 73, Table 80). Regarding primary disease, a significantly high rate was found in 374 patients (55.2%) with chronic glomerulonephritis (Fig. 74, Table 81).

Chapter 5: Current status of elderly dialysis patients

Present status of elderly dialysis patients

We defined dialysis patients who were 75 years or older as "elderly dialysis patients," and compared categories that were < 60 years, and 60 to 74 years in age. The number of patients in each group was 71,270 patients as < 60 years, 141,634 patients aged 60 to 74 years, and 100,308 patients as 75 years or older. In regard to the male-to-female ratio, males dominated in all age categories, but as age increased, the percentage of females also increased; hence, females accounted 40.8% of elderly dialysis patients (Fig. 75, Table 82). In terms of dialysis vintage, the elderly dialysis patients had the shortest dialysis vintage at 5.71 years, while 54.8% had a vintage of < 5 years and 80.3% had a vintage < 10 years (Fig. 76, Table 83). As for the primary disease among elderly dialysis patients, the percentage of nephrosclerosis was high (16.6%) compared with that among other age groups, whereas the percentages of diabetic nephropathy (34.3%) and chronic glomerulonephritis (26.5%) were low (Fig. 77, Table 84). In past histories of elderly dialysis patients, although the percentages of myocardial infarction, cerebral infarction, and proximal femur fracture were high, no difference was found for cerebral hemorrhage or limb amputation (Fig. 78). Otherwise, history of kidney transplants, history of PD, and smoking were significantly lower than all the other groups (Fig. 79).

Hemodynamics, dialysis prescriptions, and urea kinetics in elderly dialysis patients

The mean blood pressure and pulse rate of elderly dialysis patients were 149/72 mmHg and 72 bpm, respectively. Both blood pressure and pulse showed a decreasing trend as age increased (Fig. 80, Table 85). Particularly, in a comparison of blood pressure, the decrease in diastolic blood pressure was pronounced compared with systolic blood pressure, suggesting that the pulse pressure increases with aging. We compared *Kt*/*V*sp as an index of dialysis efficiency, but no clear difference was found by age (Fig. 81, Table 86). The mean dialysis time in elderly dialysis patients was 3.85 h, which was shorter than in other groups, with

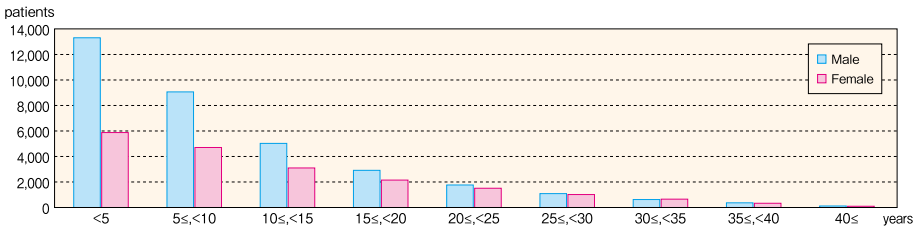

Fig. 37 HDF patient distribution, by sex and dialysis vintage, 2015

Table 40 HDF Patient distribution, by sex and dialysis vintage, 2015

Sex	< 5	5 ≤, < 10	10 ≤, < 15	15 ≤, < 20	20 ≤, < 25	25 ≤, < 30	30 ≤, < 35	35 ≤, < 40	40 ≤	Subtotal	Unspecified	No information available	Total	Mean age	S.D.
Male (%)	13,311 (38.8)	9066 (26.4)	5027 (14.7)	2914 (8.5)	1765 (5.1)	1088 (3.2)	623 (1.8)	366 (1.1)	118 (0.3)	34,278 (100.0)	38		34,316	8.83	8.24
Female (%)	5877 (30.2)	4705 (24.2)	3100 (16.0)	2149 (11.1)	1509 (7.8)	1015 (5.2)	653 (3.4)	331 (1.7)	96 (0.5)	19,435 (100.0)	25		19,460	11.03	9.34
Subtotal (%)	19,188 (35.7)	13,771 (25.6)	8127 (15.1)	5063 (9.4)	3274 (6.1)	2103 (3.9)	1276 (2.4)	697 (1.3)	214 (0.4)	53,713 (100.0)	63		53,776	9.63	8.71
No information available (%)														0	0
Total (%)	19,188 (35.7)	13,771 (25.6)	8127 (15.1)	5063 (9.4)	3274 (6.1)	2103 (3.9)	1276 (2.4)	697 (1.3)	214 (0.4)	53,713 (100.0)	63		53,776	9.63	8.71

Values in parentheses under each figure represent the percentage relative to the subtotal in each row

27.2% at < 4 h. (Fig. 82, Table 87) The mean blood flow rate among elderly dialysis patients was 195 mL/min, which was the lowest among different groups, wherein 36.0% had a blood flow rate < 200 mL/min (Fig. 83, Table 88).

Nutrition and inflammation in elderly dialysis patients

Serum albumin concentration, creatinine concentration, %CGR, and nPCR all decreased as age increased and were lowest in elderly dialysis patients (Fig. 84, Table 89). Among these, no difference was found between men and women for albumin concentration and %CGR, but males tended to be high in creatinine concentration, and females showed a high trend for nPCR. Serum CRP concentration increased with age, and among different groups, the elderly group was the highest. Between sexes, males showed a slightly high trend.

Management for anemia and CKD-MBD in elderly dialysis patients

Hemoglobin concentration showed a tendency to decrease as age increased. The mean hemoglobin concentration in elderly dialysis patients was lowest at 10.6 g/dL (Fig. 85, Table 90), wherein 27.2% of elderly dialysis patients had < 10 g/dL. Serum phosphorus concentration and intact PTH concentration also showed a decreasing trend as age increased (Figs. 86 and 87, Tables 91 and 92). The mean phosphorus concentration in elderly dialysis patients was 4.9 mg/dL, and the intact PTH concentration was 162 pg/mL, which were the lowest values between different groups. Hypophosphatemia (< 3.5 mg/dL) and hypoparathyroidism (< 60 pg/mL), less than reference values in the CKD-MBD guidelines, were found in 12.9 and 20.2% of elderly dialysis patients, respectively. In contrast, no difference was found in corrected calcium concentration between groups (Fig. 88, Table 93).

Chapter 6: Current status of diabetic dialysis patients

Present status of diabetic dialysis patients

"Diabetic dialysis patients" was defined as patients for whom diabetic nephropathy was the primary disease or who had a history of diabetes. Of 271,337 dialysis patients who responded, 144,870 were diabetic dialysis patients, accounting for 53.4% of the total. The diabetes prevalence was slightly higher in males as 57.5% than females as 45.8% (Fig. 89, Table 94). The

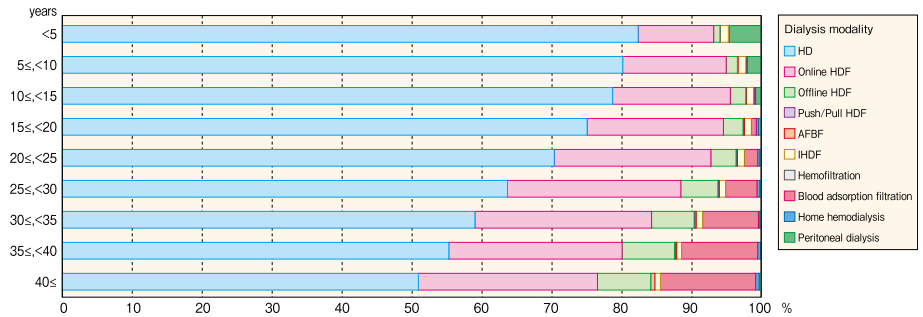

Fig. 38 Dialysis patient distribution, by dialysis modality and dialysis vintage, 2015. Abbreviations: HDF, hemodiafiltration; AFBF, acetate-free biofiltration; IHDF, intermittent infusion hemodiafiltration

Table 41 Dialysis patient distribution, by dialysis modality and dialysis vintage, 2015

Dialysis modality	< 5	5 ≤, < 10	10 ≤, < 15	15 ≤, < 20	20 ≤, < 25	25 ≤, < 30	30 ≤, < 35	35 ≤, < 40	40 ≤	Subtotal	Unspecified	No information available	Total	Mean	S.D.
Hemodialysis (%)	121,892 (82.4)	62,337 (80.1)	31,462 (78.5)	16,192 (75.1)	8464 (70.4)	4288 (63.7)	2315 (59.1)	1160 (55.3)	314 (50.9)	248,424 (79.4)	300 (76.5)	1 (100.0)	248,725 (79.4)	6.84	7.07
Offline HDF (%)	1329 (0.9)	1254 (1.6)	896 (2.2)	607 (2.8)	435 (3.6)	355 (5.3)	240 (6.1)	157 (7.5)	47 (7.6)	5320 (1.7)	12 (3.1)		5332 (1.7)	12.56	10.06
Online HDF (%)	15,968 (10.8)	11,530 (14.8)	6744 (16.8)	4202 (19.5)	2696 (22.4)	1670 (24.8)	990 (25.3)	519 (24.8)	158 (25.6)	44,477 (14.2)	50 (12.8)		44,527 (14.2)	9.50	8.55
Push/Pull HDF (%)	37 (0.0)	22 (0.0)	20 (0.0)	11 (0.1)	8 (0.1)	8 (0.1)	2 (0.1)	2 (0.1)		110 (0.0)			110 (0.0)	10.82	9.09
AFBF (%)	64 (0.0)	73 (0.1)	53 (0.1)	32 (0.1)	18 (0.1)	10 (0.1)	8 (0.2)	5 (0.2)	4 (0.6)	267 (0.1)			267 (0.1)	11.61	9.34
IHDF (%)	1790 (1.2)	892 (1.1)	414 (1.0)	211 (1.0)	117 (1.0)	60 (0.9)	36 (0.9)	14 (0.7)	5 (0.8)	3539 (1.1)	1 (0.3)		3540 (1.1)	6.66	7.01
Hemofiltration (%)	10 (0.0)	3 (0.0)	1 (0.0)	1 (0.0)		1 (0.0)				16 (0.0)			16 (0.0)	6.06	8.05
Blood adsorption dialysis (%)	8 (0.0)	10 (0.0)	60 (0.1)	142 (0.7)	229 (1.9)	302 (4.5)	312 (8.0)	229 (10.9)	84 (13.6)	1376 (0.4)			1376 (0.4)	27.9	8.01
Home hemodialysis (%)	137 (0.1)	160 (0.2)	96 (0.2)	70 (0.3)	38 (0.3)	24 (0.4)	8 (0.2)	8 (0.4)	3 (0.5)	544 (0.2)	11 (2.8)		555 (0.2)	10.8	8.32
Peritoneal dialysis (%)	6782 (4.6)	1520 (2.0)	314 (0.8)	87 (0.4)	26 (0.2)	12 (0.2)	6 (0.2)	2 (0.1)	2 (0.3)	8751 (2.8)	18 (4.6)		8769 (2.8)	2.99	3.55
Subtotal (%)	148,017 (100.0)	77,801 (100.0)	40,060 (100.0)	21,555 (100.0)	12,031 (100.0)	6730 (100.0)	3917 (100.0)	2096 (100.0)	617 (100.0)	312,824 (100.0)	392 (100.0)	1 (100.0)	313,217 (100.0)	7.31	7.55
No information available															
Total	148,017	77,801	40,060	21,555	12,031	6730	3917	2096	617	312,824	392	1	313,217	7.31	7.55

Values in parentheses under each figure represent the percentage relative to the total in each column

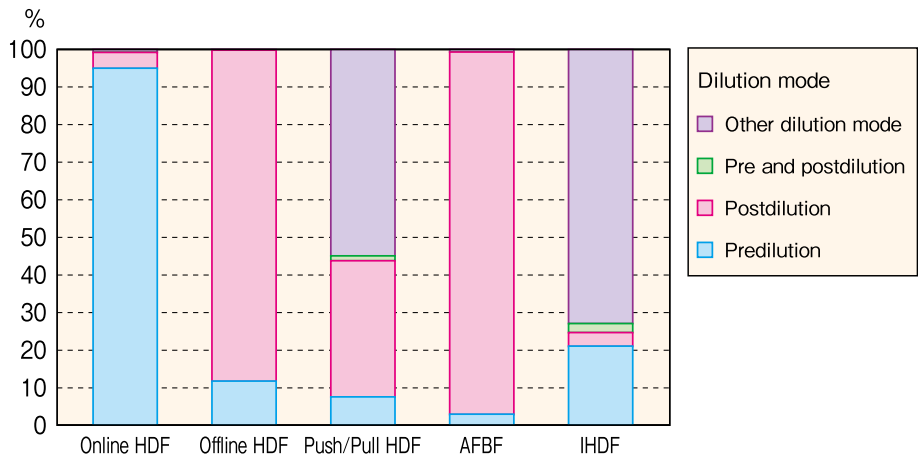

Fig. 39 HDF patient distribution, by HDF modality and dilution mode, 2015

Table 42 Patient distribution, by HDF modality and dilution mode, 2015

HDF modality	Pre-dilution	Post-dilution	Pre- and post-dilution	Other dilution mode	Subtotal	Unspecified	No information available	Total
Online HDF (%)	36,778 (94.9)	1657 (4.3)	1 (0.0)	317 (0.8)	38,753 (100.0)		5774	44,527
Offline HDF (%)	499 (11.7)	3772 (88.2)	(0.0)	7 (0.2)	4278 (100.0)	1	1053	5332
Push/Pull HDF (%)	6 (7.5)	29 (36.3)	1 (1.3)	44 (55.0)	80 (100.0)		30	110
AFBF (%)	4 (2.9)	133 (96.4)	(0.0)	1 (0.7)	138 (100.0)		129	267
IHDF (%)	383 (21.0)	67 (3.7)	43 (2.4)	1327 (72.9)	1820 (100.0)	1	1719	3540
Subtotal	37,670	5658	45	1696	45,069	2	8705	53,776

Values in parentheses under each figure represent the percentage relative to the total in each column

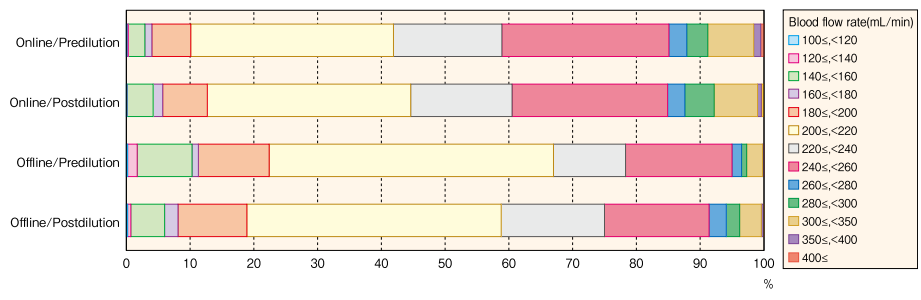

Fig. 40 HDF patient distribution, by dilution mode and blood flow rate, 2015

Table 43 HDF patient distribution, by dilution mode and blood flow rate, 2015

Dilution mode	100 ≤, < 120	120 ≤, < 140	140 ≤, < 160	160 ≤, < 180	180 ≤, < 200	200 ≤, < 220	220 ≤, < 240	240 ≤, < 260	260 ≤, < 280	280 ≤, < 300	300 ≤, < 350	350 ≤, < 400	400 ≤	Subtotal	No information available	Total	Mean	S.D.
Online HDF, Pre-dilution	33 (0.1)	60 (0.2)	932 (2.6)	380 (1.1)	2198 (6.1)	11,410 (31.8)	6111 (17.0)	9382 (26.2)	988 (2.8)	1193 (3.3)	2571 (7.2)	400 (1.1)	193 (0.5)	35,851 (100.0)	143	35,994	228.50	40.40
Online HDF, Post-dilution	1 (0.1)	0 (0.0)	66 (4.1)	24 (1.5)	113 (7.0)	514 (31.9)	257 (15.9)	394 (24.4)	44 (2.7)	74 (4.6)	110 (6.8)	10 (0.6)	5 (0.3)	1612 (100.0)	5	1617	225.60	39.80
Offline HDF, pre-dilution	1 (0.2)	7 (1.5)	41 (8.6)	5 (1.0)	53 (11.1)	213 (44.6)	54 (11.3)	80 (16.7)	7 (1.5)	4 (0.8)	12 (2.5)	1 (0.2)	0 (0.0)	478 (100.0)	6	484	207.20	35.00
Offline HDF, post-dilution	9 (0.2)	20 (0.5)	194 (5.3)	77 (2.1)	396 (10.8)	1468 (39.9)	596 (16.2)	603 (16.4)	100 (2.7)	77 (2.1)	124 (3.4)	10 (0.3)	3 (0.1)	3677 (100.0)	24	3701	213.20	35.80

Population: in-center hemodiafiltration (three times a week)
Values in parentheses under each figure represent the percentage relative to the subtotal in each row

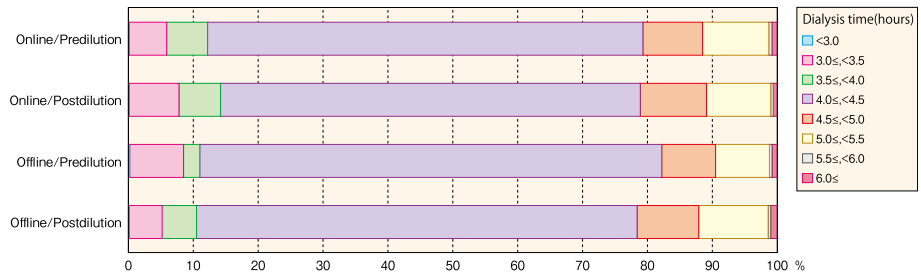

Fig. 41 HDF patient distribution, by dilution mode and dialysis time, 2015

Table 44 HDF patient distribution, by dilution mode and dialysis time, 2015

Dilution mode	< 3.0	3.0 ≤, < 3.5	3.5 ≤, < 4.0	4.0 ≤, < 4.5	4.5 ≤, < 5.0	5.0 ≤, < 5.5	5.5 ≤, < 6.0	6.0 ≤	Subtotal	No information available	Total	Mean	S.D.
Online HDF, Pre-dilution	53 (0.1)	2075 (5.8)	2274 (6.3)	24,117 (67.1)	3311 (9.2)	3655 (10.2)	167 (0.5)	285 (0.8)	35,937 (100.0)	57	35,994	4.10	0.50
Online HDF, post-dilution	1 (0.1)	124 (7.7)	103 (6.4)	1044 (64.7)	164 (10.2)	163 (10.1)	6 (0.4)	9 (0.6)	1614 (100.0)	3	1617	4.07	0.50
Offline HDF, pre-dilution	1 (0.2)	40 (8.3)	12 (2.5)	344 (71.2)	40 (8.3)	40 (8.3)	2 (0.4)	4 (0.8)	483 (100.0)	1	484	4.05	0.50
Offline HDF, post-dilution	3 (0.1)	190 (5.1)	194 (5.3)	2507 (67.9)	349 (9.5)	394 (10.7)	15 (0.4)	38 (1.0)	3690 (100.0)	11	3701	4.12	0.49

Population: in-center hemodiafiltration (three times a week)
Values in parentheses under each figure represent the percentage relative to the subtotal in each row

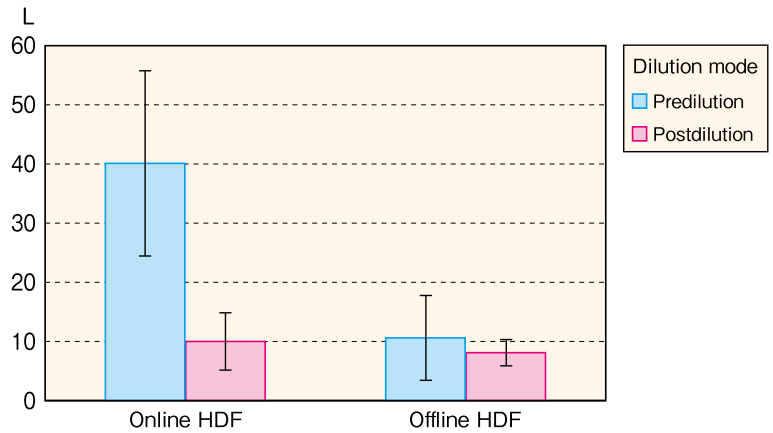

Fig. 42 Mean substitution volume, by online/offline and dilution mode, 2015

Table 45 Mean substitution volume, by online/offline and dilution mode, 2015

		Pre-dilution	Post-dilution	Pre- and post-dilution	Other dilution mode	Subtotal	Unspecified	No information available	Total
Online HDF	Patients	36,778	1657	1	317	38,753		5774	44,527
	Mean	40.1	10.0		1.8	38.6		40.0	38.6
	S.D.	15.5	4.8		4.0	16.6			16.6
Offline HDF	Patients	499	3772		7	4278	1	1053	5332
	Mean	10.6	8.1		10.0	8.4	1.0		8.4
	S.D.	7.1	2.2		13.7	3.4			3.4

diabetes prevalence become higher as the patients got older: 40% in the patient category older than 30 years old and 56.5% in the category older than 60 years and younger than 75 years (Fig. 90, Table 95). In addition, diabetes prevalence decreased as dialysis vintage got longer, and when dialysis vintage reached 25 years or longer, the percentage of diabetic dialysis patients was < 10% (Fig. 91, Table 96). The percentages of past history of myocardial infarction, cerebral infarction, and limb amputation were clearly higher among diabetic dialysis patients (Fig. 92). In contrast, no clear difference was found in cerebral hemorrhage and proximal femur fracture whether diabetes was present. Otherwise, no significant difference was found in past history of kidney transplants and PD among diabetic dialysis patients, whereas smokers were relatively numerous (Fig. 93).

Hemodynamics, dialysis prescriptions, and urea kinetics in diabetic dialysis patients

The mean systolic blood pressure in diabetic dialysis patients was 156 mmHg, which was high compared with 147 mmHg in the non-diabetic group. However, diastolic blood pressure showed no difference between patients and was 78 mmHg for all. Pulse rate was 75 and 74 bpm, respectively; thus, practically no difference was found between groups (Fig. 94, Table 97). When we compared *Kt*/*V*sp as an index of dialysis

Fig. 43 Trend of substitutional fluid volume per single session (L), 2012–2015

Table 46 The trend of substitutional fluid volume per single session (L), 2012–2015

Online HDF with pre-dilution														
Year	1 L≤, < 10	10 L≤, < 20	20 L≤, < 30	30 L≤, < 40	40 L≤, < 50	50 L≤, < 60	60 L≤, < 70	70 L≤, < 80	80 L≤	Subtotal	No information available	Total	Mean	S.D.
2012	415 (3.7)	711 (6.4)	1829 (16.4)	2320 (20.8)	3373 (30.2)	913 (8.2)	1102 (9.9)	345 (3.1)	145 (1.3)	11,153 (100.0)	122	11,275	39.1	16.7
2013	464 (2.4)	936 (4.9)	2728 (14.4)	3730 (19.7)	6791 (35.8)	1558 (8.2)	2009 (10.6)	445 (2.3)	316 (1.7)	18,977 (100.0)	267	19,244	40.6	15.8
2014	1030 (3.6)	1347 (4.7)	4583 (16.0)	5399 (18.8)	10,512 (36.6)	2138 (7.4)	2693 (9.4)	563 (2.0)	450 (1.6)	28,715 (100.0)	1166	29,881	39.6	15.8
2015	907 (2.5)	2068 (5.7)	5233 (14.5)	6687 (18.5)	13,727 (38.0)	2514 (7.0)	3660 (10.1)	794 (2.2)	494 (1.4)	36,084 (100.0)	694	36,778	40.1	15.5
Online HDF with post-dilution														
Year	1 L≤, < 5	5 L≤, < 10	10 L≤, < 15	15 L≤, < 20	20 L≤	Subtotal	No information available	Total	Mean	S.D.				
2012	31 (3.4)	289 (31.5)	460 (50.2)	113 (12.3)	24 (2.6)	917 (100.0)	36	953	10.6	3.9				
2013	172 (13.0)	536 (40.6)	474 (35.9)	104 (7.9)	35 (2.6)	1321 (100.0)	118	1439	9.2	4.5				
2014	89 (6.8)	482 (36.7)	501 (38.2)	104 (7.9)	137 (10.4)	1313 (100.0)	29	1342	10.6	5.0				
2015	141 (8.7)	627 (38.8)	619 (38.3)	97 (6.0)	134 (8.3)	1618 (100.0)	39	1657	10.0	4.8				
Offline HDF with pre-dilution														
Year	1 L≤, < 5	5 L≤, < 10	10 L≤, < 15	15 L≤, < 20	20 L≤	Subtotal	No information available	Total	Mean	S.D.				
2012	20 (4.4)	200 (43.9)	207 (45.4)	7 (1.5)	22 (4.8)	456 (100.0)	29	485	9.2	3.8				
2013	40 (7.1)	252 (45.0)	227 (40.5)	5 (0.9)	36 (6.4)	560 (100.0)	20	580	9.4	4.7				
2014	89 (14.4)	222 (35.9)	209 (33.8)	15 (2.4)	83 (13.4)	618 (100.0)	20	638	10.2	6.6				
2015	59 (12.4)	198 (41.8)	133 (28.1)	9 (1.9)	75 (15.8)	474 (100.0)	25	499	10.6	7.1				
Offline HDF with post-dilution														
Year	1 L≤,< 5	5 L≤,< 10	10 L≤,< 15	15 L≤,< 20	20 L≤	Subtotal	No information available	Total	Mean	S.D.				
2012	492 (9.9)	2845 (31.5)	1620 (50.2)	16 (12.3)	5 (2.6)	4978 (100.0)	71	5049	7.8	2.3				
2013	508 (10.1)	2775 (55.1)	1722 (34.2)	16 (0.3)	13 (0.3)	5034 (100.0)	180	5214	7.9	2.4				
2014	338 (8.3)	2235 (54.7)	1492 (36.5)	11 (0.3)	7 (0.2)	4083 (100.0)	192	4275	8.0	2.3				
2015	293 (8.1)	1913 (53.1)	1385 (38.4)	7 (0.2)	5 (0.1)	3603 (100.0)	169	3772	8.1	2.2				

Values in parentheses under each figure represent the percentage relative to the subtotal in each row

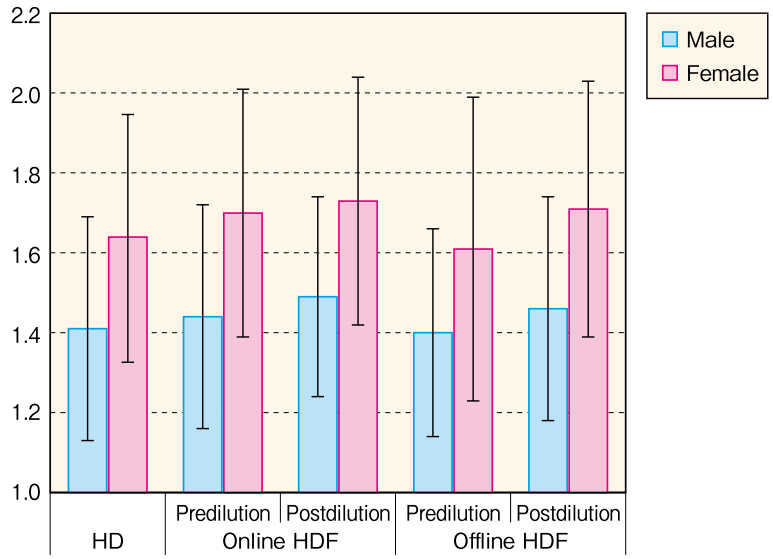

Fig. 44 *Kt/V*sp, by dialysis modality and sex, 2015

Table 47 Comparisons of HD, online HDF, and offline HDF, (1), 2015

	Hemodialysis	OnlineHDF		OfflineHDF	
		Pre-dilution	Post-dilution	Pre-dilution	Post-dilution
Number of patients (%)	223,856	35,994	1617	484	3701
Male	144,442	23,308	998	302	2226
Male (%)	64.5	64.8	61.7	62.4	60.1
Percentage of diabetes (%)	39.9	34.1	32.2	32.0	30.7
Age	68.49 ± 12.29	65.04 ± 12.48	64.85 ± 12.75	65.94 ± 13.03	66.33 ± 12.12
Dialysis vintage (years)	6.96 ± 7.10	9.42 ± 8.47	10.9 ± 9.27	12.61 ± 10.46	12.76 ± 10.00
Dialysis time (minute)	238.7 ± 31.5	245.8 ± 29.8	244.1 ± 29.9	243.3 ± 30.1	247.0 ± 29.5
Blood flow rate (mL/min)	205.8 ± 36.3	228.5 ± 40.4	225.6 ± 39.8	207.2 ± 35.0	213.2 ± 35.8
*Kt/V*sp male[a]	1.41 ± 0.26	1.44 ± 0.26	1.49 ± 0.25	1.40 ± 0.26	1.46 ± 0.26
*Kt/V*sp female [a]	1.64 ± 0.31	1.70 ± 0.31	1.73 ± 0.32	1.61 ± 0.38	1.71 ± 0.32
Serum albumin (male)	3.59 ± 0.44	3.63 ± 0.37	3.59 ± 0.39	3.55 ± 0.46	3.55 ± 0.43
Serum albumin (female)	3.53 ± 0.44	3.57 ± 0.37	3.54 ± 0.38	3.50 ± 0.44	3.49 ± 0.41
Normalized protein catabolic rate (g/kg/day, male)[a]	0.85 ± 0.17	0.87 ± 0.17	0.88 ± 0.15	0.84 ± 0.17	0.87 ± 0.17
normalized protein catabolic rate (g/kg/day, female)[a]	0.88 ± 0.19	0.91 ± 0.18	0.90 ± 0.18	0.88 ± 0.16	0.90 ± 0.18
Pre-dialysis serum creatinine (male)[a]	10.89 ± 2.80	11.48 ± 2.70	11.47 ± 2.71	11.03 ± 2.83	11.03 ± 2.76
Pre-dialysis serum creatinine (female)[a]	9.04 ± 2.34	9.60 ± 2.19	9.43 ± 2.25	9.23 ± 2.14	9.18 ± 2.06
Percent creatinine generation rate (male)[a]	98.61 ± 25.77	102.22 ± 23.75	103.00 ± 22.89	96.59 ± 26.78	99.37 ± 24.18
Percent creatinine generation rate (female)[a]	97.82 ± 26.59	102.61 ± 23.93	101.85 ± 24.88	96.58 ± 23.79	99.26 ± 23.95

Population: in-center hemodialysis or hemodiafiltration (three times a week)
[a]*Kt/V*, nPCR, creatinine concentration, and %CGR were summarized in the patients with vintages of 2 years or more and receiving dialysis three times a week
Note: Total number of each index was different from each other because response rate for the question was different in each other
For the indices from age to percent creatinine generation rate (female), "mean ± S.D." are shown

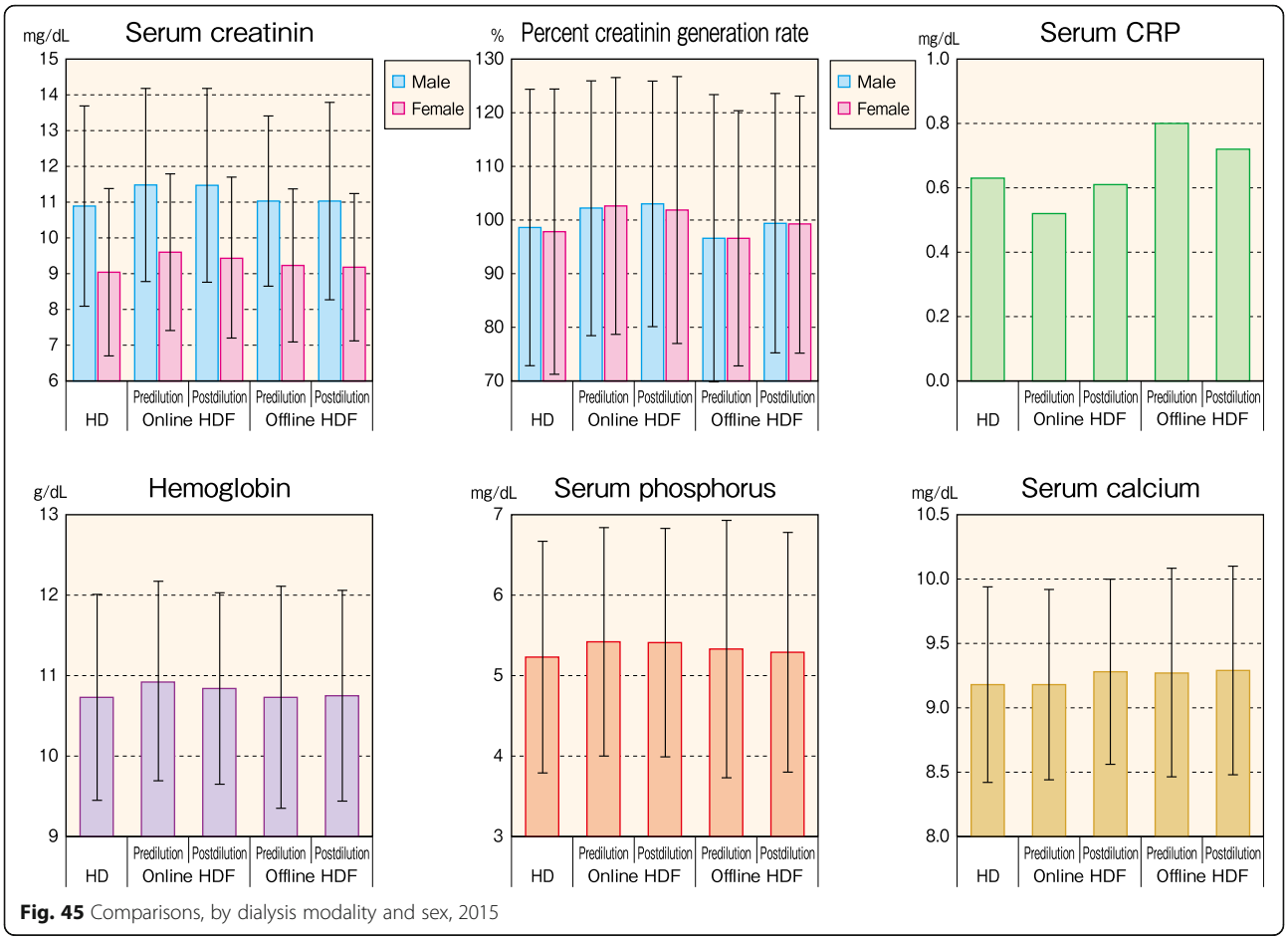

Fig. 45 Comparisons, by dialysis modality and sex, 2015

efficiency, both male and female diabetic dialysis patients showed a low trend (Fig. 95, Table 98). Comparing dialysis prescriptions, no difference was found in dialysis time and blood flow rate between groups, and distributions were also largely the same (Figs. 96 and 97, Tables 99 and 100). Although no major differences were found in dialysis prescriptions between groups, certain differences were found in hemodynamics and urea kinetics.

Nutrition and inflammation in diabetic dialysis patients

We compared indices for diabetic dialysis patient nutrition and inflammation to those of patients without diabetes. Albumin concentration in diabetic patients was the same as that in non-diabetic patients, whether male or female. In contrast, creatinine concentration, %CGR, and nPCR showed a low trend for both males and females among diabetic dialysis patients. CRP concentration showed a high trend among

Table 48 Comparisons of HD, online HDF, and offline HDF, (2), 2015

	Hemodialysis	Online HDF		Offline HDF	
		Pre-dilution	Post-dilution	Pre-dilution	Post-dilution
Serum CRP level (mg/dL)	0.63 ± 1.84	0.52 ± 1.57	0.61 ± 1.87	0.80 ± 1.76	0.72 ± 1.74
Pre-dialysis serum calcium (mg/dL)	9.18 ± 0.75	9.18 ± 0.73	9.28 ± 0.71	9.27 ± 0.80	9.29 ± 0.80
Pre-dialysis serum phosphorus (mg/dL)	5.23 ± 1.44	5.42 ± 1.42	5.41 ± 1.42	5.33 ± 1.60	5.29 ± 1.49
Intact PTH level (pg/ml)	177.1 ± 169.0	184.5 ± 177.5	197.7 ± 197.6	175.2 ± 171.4	174.7 ± 179.9
Pre-dialysis serum total cholesterol (mg/dl)	155.0 ± 35.5	159.5 ± 35.5	163.51 ± 37.5	153.5 ± 31.7	156.5 ± 36.7
Pre-dialysis hemoglobin (g/dL)	10.73 ± 1.28	10.92 ± 1.24	10.84 ± 1.19	10.73 ± 1.38	10.75 ± 1.31

Population: in-center hemodialysis or hemodiafiltration (three times a week)

Table 49 Prevalent PD patient counts, by the combination of HD, 2015

Number of peritoneal dialysis patients	
PD only	7460
PD + HD 1/week	1576
PD + HD 2/week	185
PD + HD 3/week	30
PD + HD other frequencies	71
Prevalent peritoneal dialysis patients	9322
Incident peritoneal dialysis patients	2197

The above data were obtained from the patient survey

diabetic patients that was more prominent among females (Fig. 98, Table 101).

Management for anemia and CKD-MBD in diabetic dialysis patients

The mean hemoglobin concentration in diabetic dialysis patients was 10.7 g/dL, which was largely equal to the 10.8 g/dL in non-diabetic patients (Fig. 99, Table 102). The serum phosphorus concentration was 5.2 and 5.3 mg/dL for dialysis patients with and without diabetes, revealing almost no difference (Fig. 100, Table 103). Furthermore, the corrected calcium concentration also showed no difference, with a mean of 9.1 and 9.2 mg/dL, respectively (Fig. 101, Table 104). Intact PTH concentration was 189 pg/mL for non-diabetic patients, whereas it was slightly lower for diabetic dialysis patients at 169 pg/mL (Fig. 102, Table 105).

Annual changes in diabetic dialysis patient dynamics

A survey of diabetes prevalence was started from 2013 (In the 2013 survey, patients with diabetes were defined as having a history of diabetes, or having used three types of diabetes therapeutics. Primary disease was not considered). The dynamics of diabetic dialysis patients from 2013 to 2015 are shown in the figure (Fig. 103, Table 106).

The number of diabetic dialysis patients, both males and females, showed an increasing trend over time. This was more pronounced among males, but hardly any difference was found overall in the male-to-female ratio. A slight difference was found relative to age with an increasing trend seen from 67.5 to 67.8 years and thereafter to 68.0 years. Differences relative to dialysis vintage were also found, which gradually got longer from 4.87 to 4.92 and 5.03 years (Fig. 104, Table 107, Fig. 105, Table 108).

Conclusions

In a summary of 2015 JRDR survey, chronic dialysis patients and dialysis facilities had been still increasing but the increasing rates had been gradually slowing in Japan. The average ages of incident and prevalent dialysis patients had been also glowing as up to 70 years old. Most of dialysis patients had been treated by in-center dialysis, and PD patient count had been slightly decreased. The combination therapy with PD and HDF is one of the unique points of the Japanese PD style, even if they start the combination therapy just after the dialysis initiation. The percentage of home dialysis defined as PD and HHD was quite as low as 3.0% of all dialysis patients, and Japan was one of the lowest countries in the penetration of home dialysis. A well-balanced dialysis modality choice might be needed in the future when home cares for elder dialysis patients would be needed. Online HDF had been rapidly increasing more and more just after the revision of medical reimbursement for online HDF in 2012, and the percentage of all convective therapy was 17% of all dialysis patients. The Japanese style online HDF is very unique compared with the worldwide standard method, so the evidence of it should be established in Japan. Further JRDR data analyses could clarify the relationships between various dialysis modalities, patient care, and clinical outcomes; furthermore, it could also make it possible to establish clinical practice guidelines or medical reimbursement revisions based on the evidence.

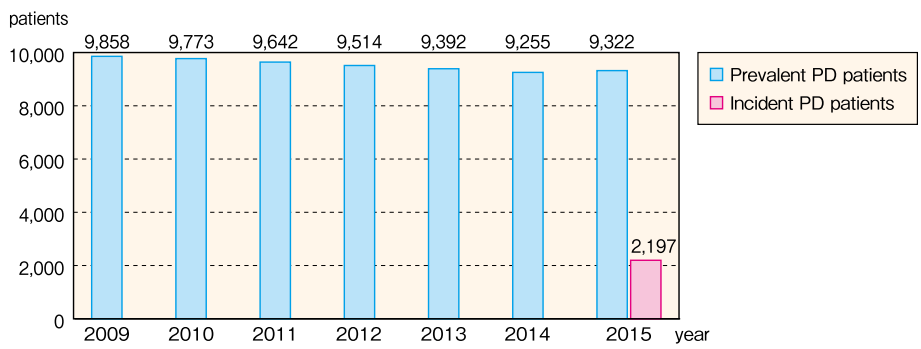

Fig. 46 Prevalent and incident PD patient counts, 2009–2015

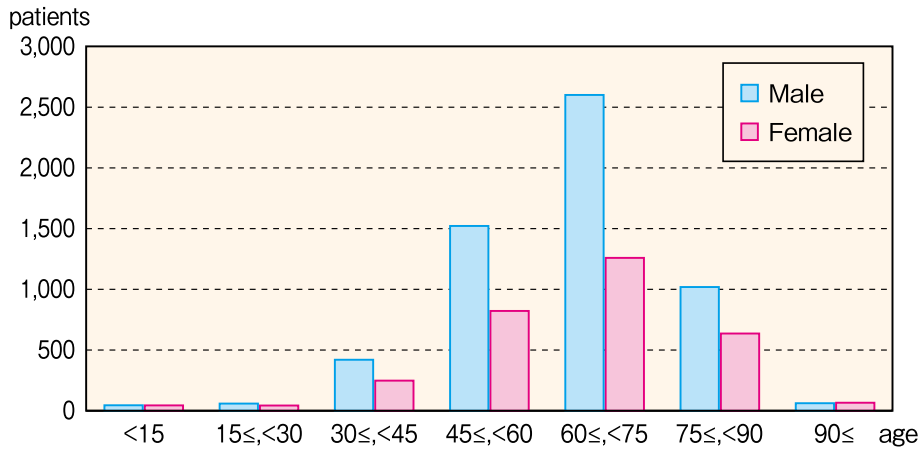

Fig. 47 Prevalent PD patient distribution, by age and sex, 2015

Table 50 Prevalent PD patient distribution, by age and sex, 2015

Age	Male	Female	Subtotal	No information available	Total
< 15 (%)	45 (0.8)	44 (1.4)	89 (1.0)		89 (1.0)
15 ≤, < 30 (%)	59 (1.0)	43 (1.4)	102 (1.2)		102 (1.2)
30 ≤, < 45 (%)	420 (7.3)	248 (8.0)	668 (7.6)		668 (7.6)
45 ≤, < 60 (%)	1522 (26.6)	822 (26.4)	2344 (26.5)		2344 (26.5)
60 ≤, < 75 (%)	2601 (45.4)	1259 (40.4)	3860 (43.6)		3860 (43.6)
75 ≤, < 90 (%)	1019 (17.8)	636 (20.4)	1655 (18.7)		1655 (18.7)
90 ≤ (%)	62 (1.1)	66 (2.1)	128 (1.4)		128 (1.4)
Subtotal (%)	5728 (100.0)	3118 (100.0)	8846 (100.0)		8846 (100.0)
No information available					
Total	5728	3118	8846		8846
Mean	62.8	62.74	62.78	0	62.78
S.D.	13.87	15.77	14.57	0	14.57

Values in parentheses under each figure represent the percentage relative to the total in each column

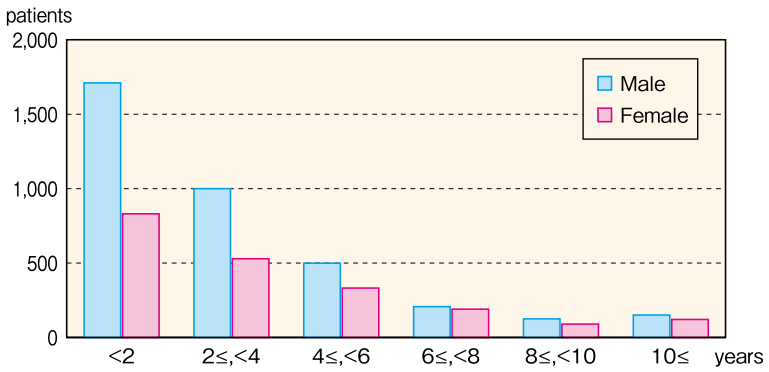

Fig. 48 Prevalent PD patient distribution, by PD vintage and sex, 2015

Table 51 Prevalent PD patient distribution, by PD vintage and sex, 2015

PD vintage	Male	Female	Subtotal	No information available	Total
< 1 (%)	921 (24.9)	446 (21.3)	1367 (23.6)		1367 (23.6)
1 ≤, < 2 (%)	790 (21.4)	385 (18.4)	1175 (20.3)		1175 (20.3)
2 ≤, < 4 (%)	1000 (27.1)	529 (25.3)	1529 (26.4)		1529 (26.4)
4 ≤, < 6 (%)	499 (13.5)	332 (15.9)	831 (14.4)		831 (14.4)
6 ≤, < 8 (%)	207 (5.6)	190 (9.1)	397 (6.9)		397 (6.9)
8 ≤, < 10 (%)	125 (3.4)	90 (4.3)	215 (3.7)		215 (3.7)
10 ≤ (%)	151 (4.1)	121 (5.8)	272 (4.7)		272 (4.7)
Subtotal (%)	3693 (100.0)	2093 (100.0)	5786 (100.0)		5786 (100.0)
No information available	2035	1025	3060		3060
Total	5728	3118	8846		8846
Mean	3.07	3.63	3.27		3.27
S.D.	3.09	3.43	3.23		3.23

Values in parentheses under each figure represent the percentage relative to the total in each column

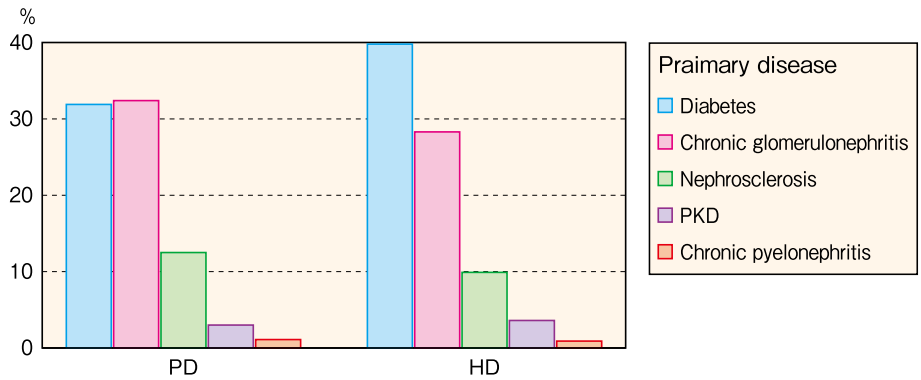

Fig. 49 Prevalent dialysis patient distribution, by PD or HD and primary disease, 2015. Abbreviation: PKD, polycystic kidney disease

Table 52 Prevalent patient distribution, by PD or HD and primary disease, 2015

Primary disease	Peritoneal dialysis (%)	Hemodialysis (%)
Diabetes	2823 (31.9)	98,975 (39.8)
Chronic glomerulonephritis	2864 (32.4)	70,315 (28.3)
Nephrosclerosis	1103 (12.5)	24,511 (9.9)
PKD	264 (3.0)	8869 (3.6)
Chronic pyelonephritis	98 (1.1)	2272 (0.9)
Others	1694 (19.1)	43,783 (17.6)
Subtotal	8846 (100.0)	248,712 (100.0)
No information available		13
Total	8846	248,725

Values in parentheses under each figure represent the percentage relative to the total in each column

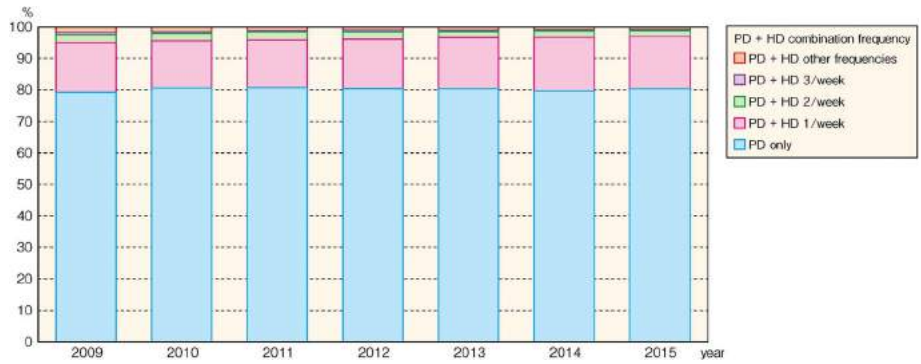

Fig. 50 Prevalent PD patient distribution, by PD + HDF combination frequency, 2009–2015

Table 53 Prevalent patient distribution, by PD + HD combination frequency, 2009–2015

PD + HD combination frequency	2009	2010	2011	2012	2013	2014	2015
PD only (%)	6022 (79.3)	7436 (80.6)	7370 (80.7)	7323 (80.4)	7324 (80.3)	7188 (79.7)	7104 (80.3)
PD + HD 1/week (%)	1197 (15.8)	1388 (15.0)	1393 (15.2)	1428 (15.7)	1503 (16.5)	1544 (17.1)	1470 (16.6)
PD + HD 2/week (%)	191 (2.5)	225 (2.4)	224 (2.5)	219 (2.4)	173 (1.9)	177 (2.0)	172 (1.9)
PD + HD 3/week (%)	53 (0.7)	51 (0.6)	46 (0.5)	55 (0.6)	34 (0.4)	40 (0.4)	29 (0.3)
PD + HD other frequencies (%)	128 (1.7)	130 (1.4)	105 (1.1)	86 (0.9)	87 (1.0)	73 (0.8)	71 (0.8)
Subtotal (%)	7591 (100.0)	9230 (100.0)	9138 (100.0)	9111 (100.0)	9121 (100.0)	9022 (100.0)	8846 (100.0)

Values in parentheses under each figure represent the percentage relative to the total in each column

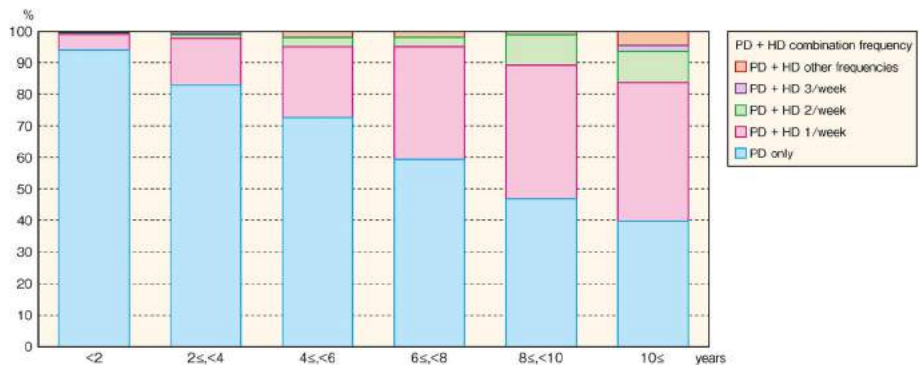

Fig. 51 Prevalent PD patient distribution, by PD vintage and PD + HD combination frequency, 2015

Table 54 Prevalent patient distribution, by PD vintage and PD + HD combination frequency, 2015

PD + HD combination frequency	< 1	1 ≤, < 2	2 ≤, < 4	4 ≤, < 6	6 ≤, < 8	8 ≤, < 10	10 ≤	Subtotal	No information available	Total	Mean	S.D.
PD only (%)	1326 (28.1)	1067 (22.6)	1269 (26.9)	605 (12.8)	236 (5.0)	101 (2.1)	108 (2.3)	4712 (100.0)	2392	7104	2.67	2.65
PD + HD 1/week (%)	37 (4.1)	90 (10.1)	228 (25.5)	186 (20.8)	142 (15.9)	91 (10.2)	120 (13.4)	894 (100.0)	576	1470	5.72	3.95
PD + HD 2/week (%)	4 (3.4)	9 (7.8)	18 (15.5)	25 (21.6)	12 (10.3)	21 (18.1)	27 (23.3)	116 (100.0)	56	172	6.95	4.44
PD + HD 3/week (%)	(0.0)	2 (14.3)	6 (42.9)	1 (7.1)	(0.0)	(0.0)	5 (35.7)	14 (100.0)	15	29	7.44	7.28
PD + HD other frequencies (%)	(0.0)	7 (14.0)	8 (16.0)	14 (28.0)	7 (14.0)	2 (4.0)	12 (24.0)	50 (100.0)	21	71	6.65	4.86
Subtotal (%)	1367 (23.6)	1175 (20.3)	1529 (26.4)	831 (14.4)	397 (6.9)	215 (3.7)	272 (4.7)	5786 (100.0)	3060	8846	3.27	3.23

Values in parentheses under each figure represent the percentage relative to the subtotal in each row

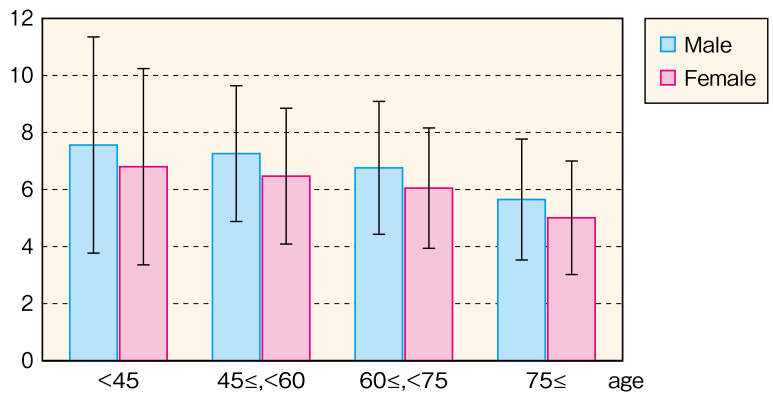

Fig. 52 PD fluid volume, by age and sex, 2015

Table 55 PD dialysis fluid volume, by age and sex, 2015

		< 45	45 ≤, < 60	60 ≤, < 75	75 ≤	Subtotal
Male	Mean	7.56	7.26	6.76	5.65	6.71
	S.D.	3.79	2.38	2.33	2.12	2.54
Female	Female	6.80	6.47	6.05	5.01	5.98
	Mean	3.44	2.38	2.11	1.99	2.39

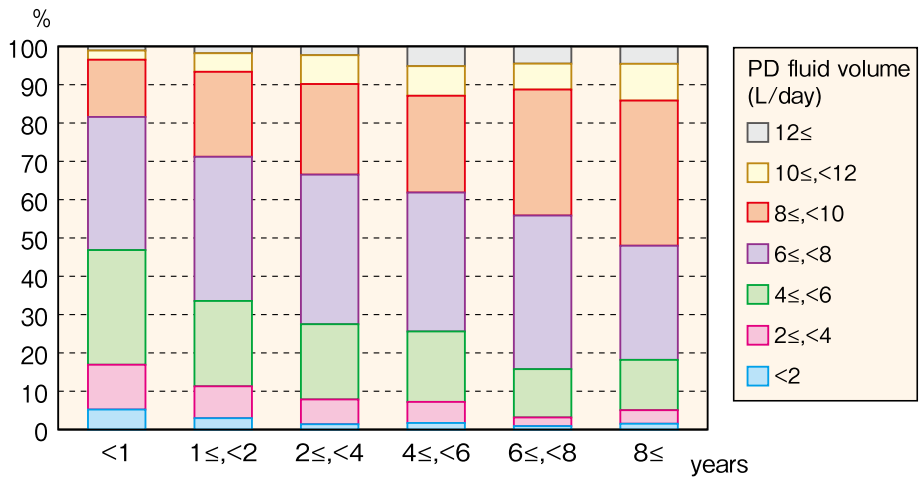

Fig. 53 Prevalent PD patient distribution, by PD vintage and PD fluid volume, 2015

Table 56 Prevalent patient distribution, by PD vintage and PD fluid volume, 2015

PD fluid volume	< 1	1 ≤, < 2	2 ≤, < 4	4 ≤, < 6	6 ≤, < 8	8 ≤	Subtotal	No information available	Total	Mean	S.D.
< 2 (%)	63 (50.4)	30 (24.0)	17 (13.6)	10 (8.0)	2 (1.6)	3 (2.4)	125 (100.0)	3	128	1.31	2.09
2 ≤, < 4 (%)	141 (40.5)	84 (24.1)	79 (22.7)	32 (9.2)	5 (1.4)	7 (2.0)	348 (100.0)	7	355	1.46	1.97
4 ≤, < 6 (%)	361 (36.6)	225 (22.8)	240 (24.3)	107 (10.8)	28 (2.8)	26 (2.6)	987 (100.0)	10	997	1.71	2.06
6 ≤, < 8 (%)	419 (25.6)	380 (23.2)	477 (29.2)	211 (12.9)	89 (5.4)	59 (3.6)	1635 (100.0)	39	1674	2.27	2.63
8 ≤, < 10 (%)	180 (18.2)	224 (22.7)	289 (29.3)	147 (14.9)	73 (7.4)	75 (7.6)	988 (100.0)	52	1040	2.89	3
10 ≤, < 12 (%)	29 (11.6)	49 (19.7)	92 (36.9)	45 (18.1)	15 (6.0)	19 (7.6)	249 (100.0)	8	257	3.2	3.14
12 ≤ (%)	13 (12.0)	18 (16.7)	28 (25.9)	30 (27.8)	10 (9.3)	9 (8.3)	108 (100.0)	2	110	3.6	3.35
Subtotal (%)	1206 (27.2)	1010 (22.7)	1222 (27.5)	582 (13.1)	222 (5.0)	198 (4.5)	4440 (100.0)	121	4561	2.28	2.66
No information available (%)	120 (44.1)	57 (21.0)	47 (17.3)	23 (8.5)	14 (5.1)	11 (4.0)	272 (100.0)	2271	2543	1.75	2.59
Total (%)	1326 (28.1)	1067 (22.6)	1269 (26.9)	605 (12.8)	236 (5.0)	209 (4.4)	4712 (100.0)	2392	7104	2.25	2.66
Mean	5.62	6.33	6.7	6.94	7.36	7.36	6.42	7.17	6.44		
S.D.	2.33	2.45	2.48	2.68	2.25	2.47	2.51	2.14	2.51		

Values in parentheses under each figure represent the percentage relative to the subtotal in each row

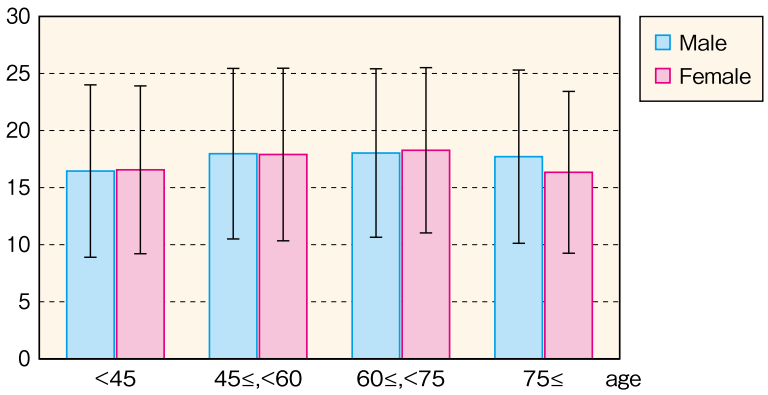

Fig. 54 PD treatment time, by age and sex, 2015

Table 57 PD treatment time, by age and sex, 2015

		< 45	45 ≤, < 60	60 ≤, < 75	75 ≤	Subtotal
Male	Mean	16.45	17.97	18.03	17.71	17.81
	S.D.	7.55	7.47	7.38	7.59	7.47
Female	Female	16.56	17.9	18.27	16.34	17.55
	Mean	7.35	7.56	7.24	7.51	7.44

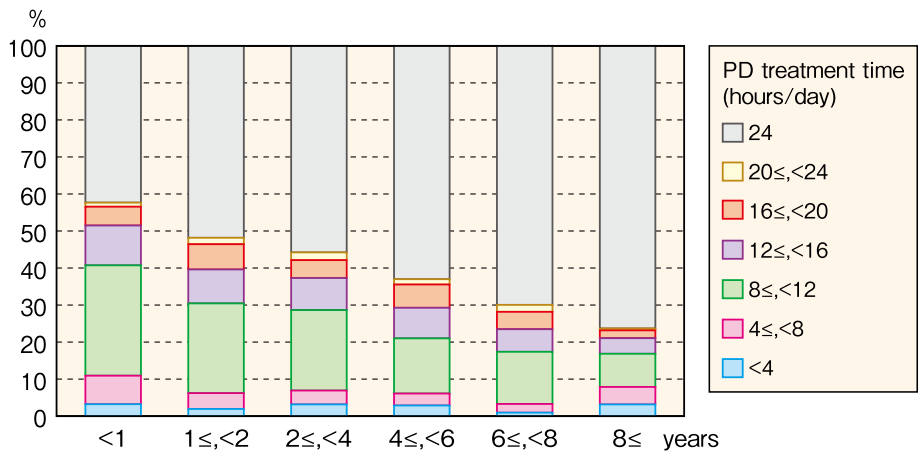

Fig. 55 Prevalent PD patient distribution, by PD vintage and PD treatment time, 2015

Table 58 Prevalent patient distribution, by PD vintage and PD treatment time, 2015

Treatment time	< 1	1 ≤, < 2	2 ≤, < 4	4 ≤, < 6	6 ≤, < 8	8 ≤	Subtotal	No information available	Total	Mean	S.D.
< 4 (%)	38 (31.9)	19 (16.0)	38 (31.9)	16 (13.4)	2 (1.7)	6 (5.0)	119 (100.0)		119	2.14	2.37
4 ≤, < 8 (%)	91 (43.3)	42 (20.0)	45 (21.4)	18 (8.6)	5 (2.4)	9 (4.3)	210 (100.0)	1	211	1.7	2.6
8 ≤, < 12 (%)	352 (35.9)	238 (24.3)	261 (26.6)	83 (8.5)	30 (3.1)	17 (1.7)	981 (100.0)	15	996	1.66	2.11
12 ≤, < 16 (%)	127 (32.7)	90 (23.2)	104 (26.8)	46 (11.9)	13 (3.4)	8 (2.1)	388 (100.0)	3	391	1.86	2.28
16 ≤, < 20 (%)	60 (25.6)	67 (28.6)	58 (24.8)	35 (15.0)	10 (4.3)	4 (1.7)	234 (100.0)	4	238	2.03	2.32
20 ≤, < 24 (%)	13 (19.1)	17 (25.0)	25 (36.8)	8 (11.8)	4 (5.9)	1 (1.5)	68 (100.0)	1	69	2.19	1.91
24 ≤ (%)	500 (21.5)	509 (21.9)	670 (28.8)	351 (15.1)	149 (6.4)	145 (6.2)	2324 (100.0)	78	2402	2.67	2.89
Subtotal (%)	1181 (27.3)	982 (22.7)	1201 (27.8)	557 (12.9)	213 (4.9)	190 (4.4)	4324 (100.0)	102	4426	2.26	2.65
No information available (%)	145 (37.4)	85 (21.9)	68 (17.5)	48 (12.4)	23 (5.9)	19 (4.9)	388 (100.0)	2290	2678	2.09	2.75
Total (%)	1326 (28.1)	1067 (22.6)	1269 (26.9)	605 (12.8)	236 (5.0)	209 (4.4)	4712 (100.0)	2392	7104	2.25	2.66
Mean	15.77	17.55	17.96	19.11	20.26	20.41	17.64	20.91	17.71		
S.D.	7.67	7.33	7.43	7.02	6.31	6.87	7.47	5.98	7.46		

Values in parentheses under each figure represent the percentage relative to the subtotal in each row

Table 59 Prevalent PD patient counts, by APD machine use, 2015

	Patients on APD	Patients on CAPD	Subtotal	Unspecified	No information available	Total
Patients (%)	2061 (44.9)	2527 (55.1)	4588 (100.0)	9	2507	7104

Values in parentheses under each figure represent the percentage relative to the subtotal in each row

Table 60 Prevalent PD patient counts, by PD fluid changing maneuver, 2015

	Manual exchange	Devices using UV irradiation	Devices using heat sterilization	Other devices including semi-automated	Subtotal	Unspecified	No information available	Total
Patients (%)	1372 (30.2)	2382 (52.4)	672 (14.8)	122 (2.7)	4548 (100.0)	16	2540	7104

Values in parentheses under each figure represent the percentage relative to the subtotal in each row

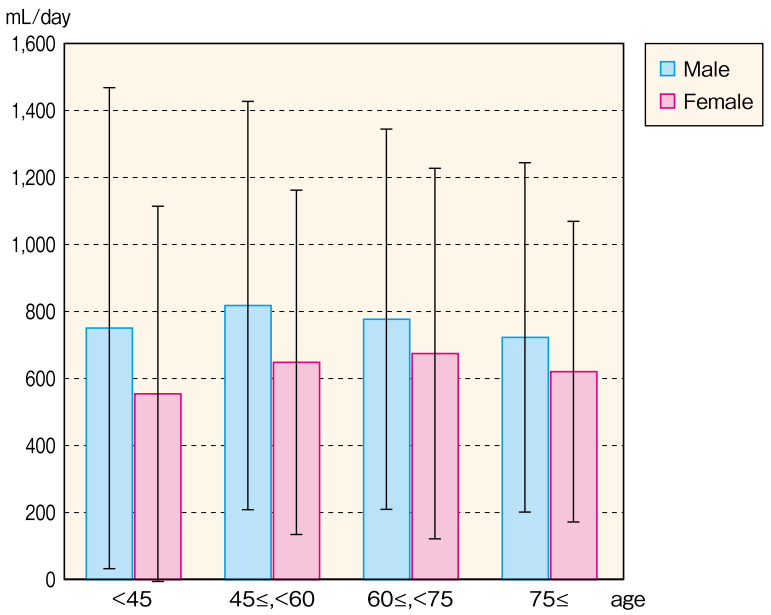

Fig. 56 Urine volume, by age and sex, 2015

Table 61 Urine volume, by age and sex, 2015

		< 45	45 ≤, < 60	60 ≤, < 75	75 ≤	Total
Male	Mean	750.74	817.98	776.99	722.85	773.86
	S.D.	717.72	609.21	567.5	521.34	583.4
Female	Female	554.39	648.37	674.59	620.58	643.14
	Mean	560.01	513.82	552.94	448.63	523.27

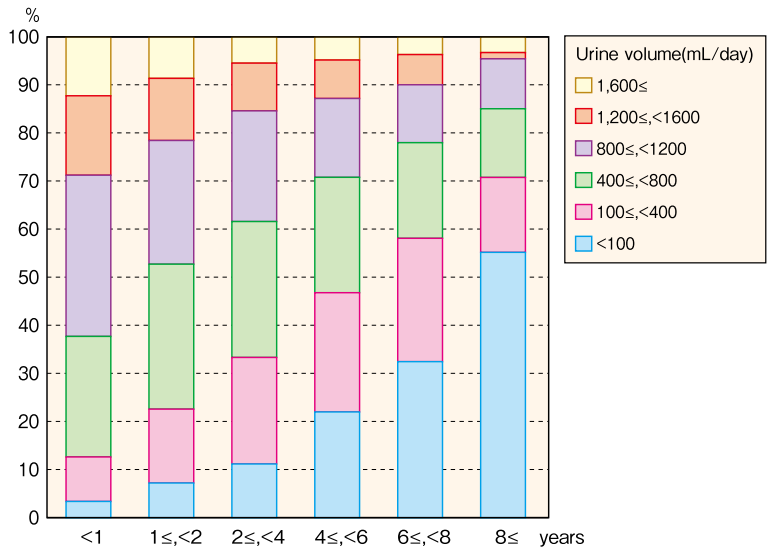

Fig. 57 Prevalent PD patient distribution, by PD vintage and urine volume, 2015

Table 62 Prevalent PD patient distribution, by PD vintage and urine volume, 2015

urine volume	< 1	1 ≤, < 2	2 ≤, < 4	4 ≤, < 6	6 ≤, < 8	8 ≤	Subtotal	No information available	Total	Mean	S.D.
< 100 (%)	34 (7.2)	62 (13.2)	117 (24.9)	110 (23.4)	62 (13.2)	85 (18.1)	470 (100.0)	25	495	4.72	3.93
100 ≤, < 400 (%)	93 (14.2)	132 (20.2)	232 (35.5)	124 (19.0)	49 (7.5)	24 (3.7)	654 (100.0)	18	672	2.74	2.23
400 ≤, < 800 (%)	252 (25.5)	259 (26.2)	296 (30.0)	120 (12.2)	38 (3.9)	22 (2.2)	987 (100.0)	31	1018	2.01	2.2
800 ≤, < 1200 (%)	337 (36.6)	221 (24.0)	241 (26.2)	82 (8.9)	23 (2.5)	16 (1.7)	920 (100.0)	18	938	1.59	2.01
1200 ≤, < 1600 (%)	166 (38.2)	111 (25.5)	104 (23.9)	40 (9.2)	12 (2.8)	2 (0.5)	435 (100.0)	9	444	1.47	1.8
1600 ≤ (%)	123 (42.4)	74 (25.5)	57 (19.7)	24 (8.3)	7 (2.4)	5 (1.7)	290 (100.0)	6	296	1.38	1.89
Subtotal (%)	1005 (26.8)	859 (22.9)	1047 (27.9)	500 (13.3)	191 (5.1)	154 (4.1)	3756 (100.0)	107	3863	2.26	2.6
No information available (%)	321 (33.6)	208 (21.8)	222 (23.2)	105 (11.0)	45 (4.7)	55 (5.8)	956 (100.0)	2285	3241	2.19	2.88
Total (%)	1326 (28.1)	1067 (22.6)	1269 (26.9)	605 (12.8)	236 (5.0)	209 (4.4)	4712 (100.0)	2392	7104	2.25	2.66
Mean	950.45	797.06	669.32	545.45	432.99	294.81	729.89	565.37	725.34		
S.D.	547.26	555	533.21	527.8	490.75	461.98	565.16	549.19	565.3		

Values in parentheses under each figure represent the percentage relative to the subtotal in each row

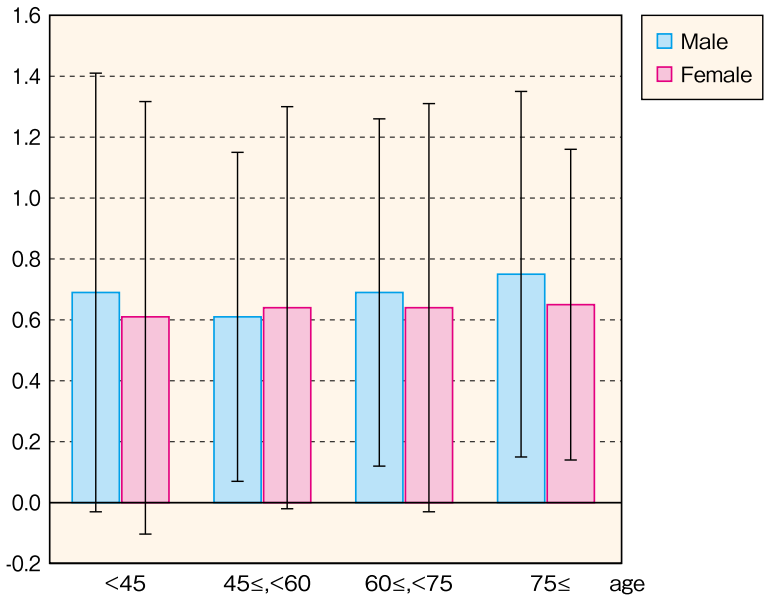

Fig. 58 Residual renal *Kt/V*, by age and sex, 2015

Table 63 Residual renal *Kt/V*, by age and sex, 2015

		< 45	45 ≤, < 60	60 ≤, < 75	75 ≤	Subtotal
Male	Mean	0.69	0.61	0.69	0.75	0.68
	S.D.	0.72	0.54	0.57	0.6	0.58
Female	Female	0.61	0.64	0.64	0.65	0.64
	Mean	0.71	0.66	0.67	0.51	0.64

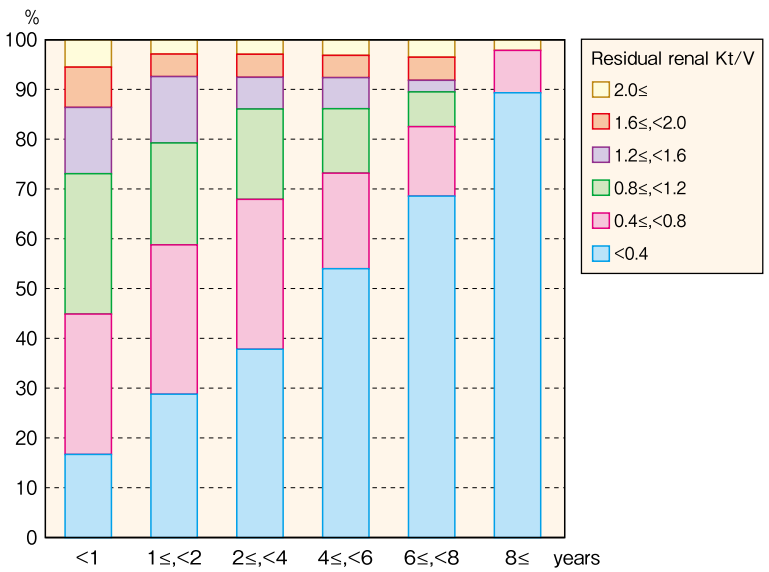

Fig. 59 Prevalent PD patient distribution, PD vintage and residual renal *Kt/V*, 2015

Table 64 Patient distribution, PD vintage and residual renal *Kt/V*, 2015

Residual renal *Kt/V*	< 1	1 ≤, < 2	2 ≤, < 4	4 ≤, < 6	6 ≤, < 8	8 ≤	Subtotal	No information available	Total	Mean	S.D.
< 0.4 (%)	64 (10.6)	121 (20.1)	196 (32.5)	121 (20.1)	59 (9.8)	42 (7.0)	603 (100.0)	31	634	3.25	2.8
0.4 ≤, < 0.8 (%)	108 (24.1)	126 (28.1)	156 (34.7)	43 (9.6)	12 (2.7)	4 (0.9)	449 (100.0)	15	464	1.8	1.74
0.8 ≤, < 1.2 (%)	108 (33.4)	86 (26.6)	94 (29.1)	29 (9.0)	6 (1.9)		323 (100.0)	5	328	1.48	1.54
1.2 ≤, < 1.6 (%)	51 (32.7)	56 (35.9)	33 (21.2)	14 (9.0)	2 (1.3)		156 (100.0)	2	158	1.33	1.46
1.6 ≤, < 2.0 (%)	31 (35.2)	19 (21.6)	24 (27.3)	10 (11.4)	4 (4.5)		88 (100.0)	5	93	1.64	1.78
2.0 ≤ (%)	21 (35.6)	12 (20.3)	15 (25.4)	7 (11.9)	3 (5.1)	1 (1.7)	59 (100.0)	1	60	1.88	2.31
Subtotal (%)	383 (22.8)	420 (25.0)	518 (30.9)	224 (13.3)	86 (5.1)	47 (2.8)	1678 (100.0)	59	1737	2.21	2.29
No information available (%)	943 (31.1)	647 (21.3)	751 (24.8)	381 (12.6)	150 (4.9)	162 (5.3)	3034 (100.0)	2333	5367	2.27	2.84
Total (%)	1326 (28.1)	1067 (22.6)	1269 (26.9)	605 (12.8)	236 (5.0)	209 (4.4)	4712 (100.0)	2392	7104	2.25	2.66
Mean	0.89	0.72	0.61	0.53	0.38	0.12	0.67	0.51	0.66		
S.D.	0.58	0.57	0.59	0.63	0.6	0.34	0.61	0.59	0.61		

Values in parentheses under each figure represent the percentage relative to the subtotal in each row

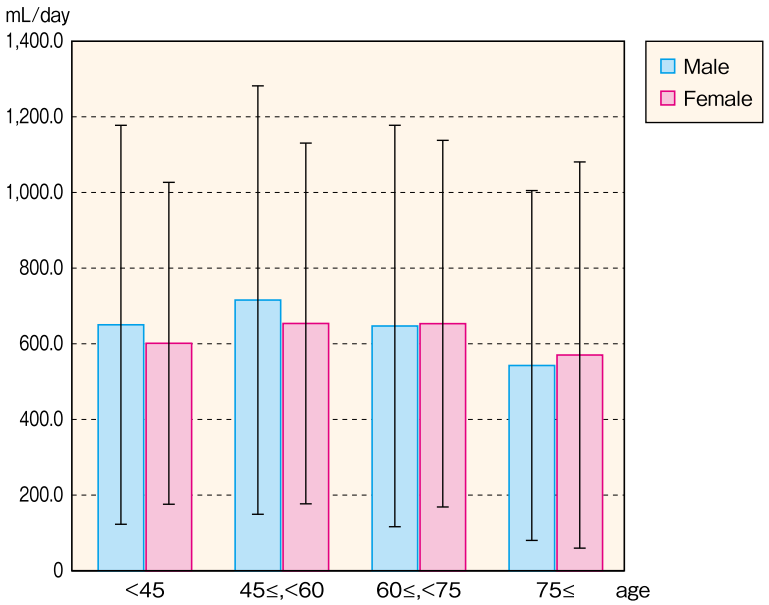

Fig. 60 Ultrafiltration volume, by age and sex, 2015

Table 65 Ultrafiltration volume, by age and sex, 2015

		< 45	45 ≤, < 60	60 ≤, < 75	75 ≤	Subtotal
Male	Mean	650.2	715.6	647.0	542.6	641.3
	S.D.	528.1	567.1	531.4	463.1	529.1
Female	Mean	601.3	653.7	653.2	570.3	628.4
	S.D.	426.1	477.5	485.3	511.2	485.0

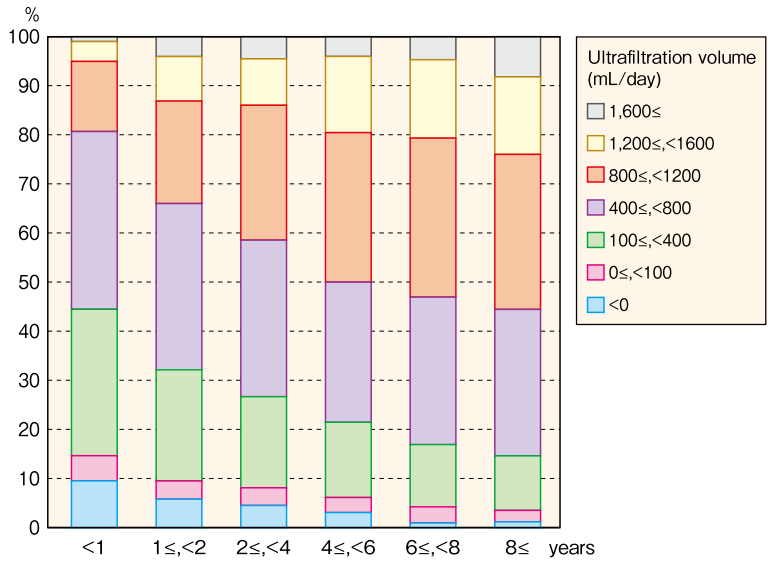

Fig. 61 Prevalent PD patient distribution, by PD vintage and ultrafiltration volume, 2015

Table 66 Prevalent PD patient distribution, by PD vintage and ultrafiltration volume, 2015

Ultrafiltration volume	< 1	1 ≤, < 2	2 ≤, < 4	4 ≤, < 6	6 ≤, < 8	8 ≤	Subtotal	No information available	Total	Mean	S.D.
< 0 (%)	106 (46.3)	53 (23.1)	50 (21.8)	16 (7.0)	2 (0.9)	2 (0.9)	229 (100.0)	3	232	1.21	1.66
0 ≤, < 100 (%)	57 (36.1)	34 (21.5)	40 (25.3)	16 (10.1)	7 (4.4)	4 (2.5)	158 (100.0)	1	159	1.77	2.11
100 ≤, < 400 (%)	332 (38.1)	207 (23.8)	206 (23.7)	80 (9.2)	27 (3.1)	19 (2.2)	871 (100.0)	11	882	1.66	2.31
400 ≤, < 800 (%)	403 (30.3)	310 (23.3)	354 (26.6)	149 (11.2)	64 (4.8)	51 (3.8)	1331 (100.0)	28	1359	2.06	2.44
800 ≤, < 1200 (%)	159 (17.0)	191 (20.4)	305 (32.6)	159 (17.0)	69 (7.4)	54 (5.8)	937 (100.0)	34	971	2.90	2.98
1200 ≤, < 1600 (%)	45 (12.0)	83 (22.1)	105 (28.0)	81 (21.6)	34 (9.1)	27 (7.2)	375 (100.0)	27	402	3.19	2.87
1600 ≤ (%)	11 (7.7)	37 (25.9)	50 (35.0)	21 (14.7)	10 (7.0)	14 (9.8)	143 (100.0)	6	149	3.26	3.00
Subtotal (%)	1113 (27.5)	915 (22.6)	1110 (27.4)	522 (12.9)	213 (5.3)	171 (4.2)	4044 (100.0)	110	4154	2.26	2.63
No information available (%)	213 (31.9)	152 (22.8)	159 (23.8)	83 (12.4)	23 (3.4)	38 (5.7)	668 (100.0)	2282	2950	2.19	2.80
Total (%)	1326 (28.1)	1067 (22.6)	1269 (26.9)	605 (12.8)	236 (5.0)	209 (4.4)	4712 (100.0)	2392	7104	2.25	2.66
Mean	444.58	625.77	688.97	757.49	816.45	857.65	630.1	868.98	636.43		
S.D.	465.93	519.69	514.59	486.67	475.62	494.84	512.47	477.55	512.96		

Values in parentheses under each figure represent the percentage relative to the subtotal in each row

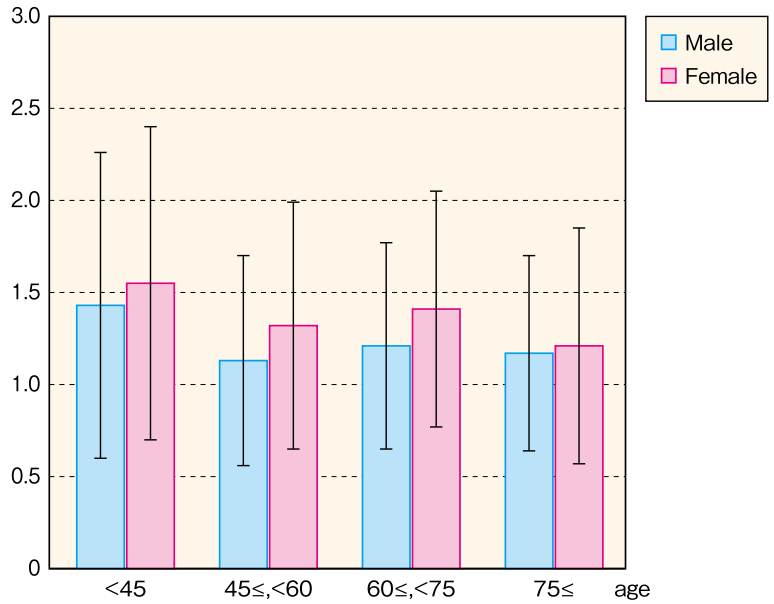

Fig. 62 PD *Kt/V*, by age and sex, 2015

Table 67 PD *Kt/V*, by age and sex, 2015

		< 45	45 ≤, < 60	60 ≤, < 75	75 ≤	Subtotal
Male	Mean	1.43	1.13	1.21	1.17	1.2
	S.D.	0.83	0.57	0.56	0.53	0.59
Female	Mean	1.55	1.32	1.41	1.21	1.37
	S.D.	0.85	0.67	0.64	0.64	0.68

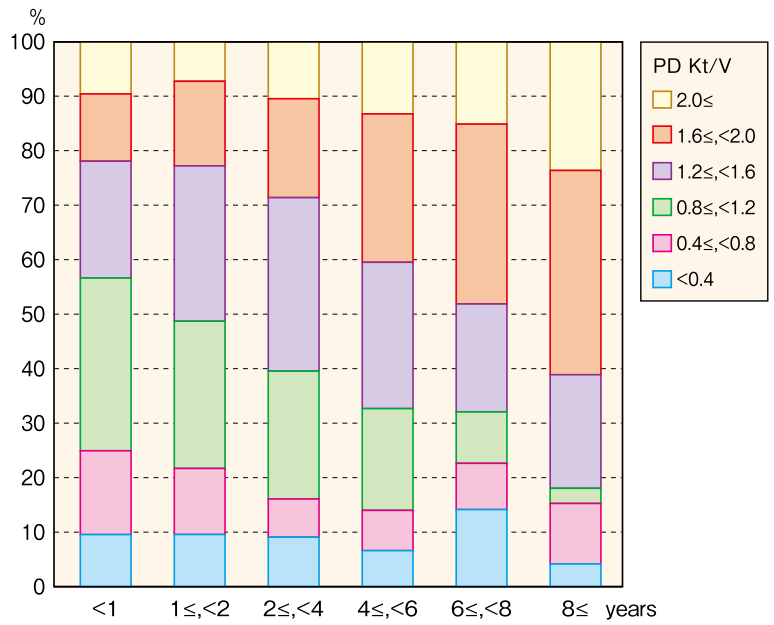

Fig. 63 Prevalent PD patient distribution, by PD vintage and PD *Kt/V*, 2015

Table 68 Prevalent PD patient distribution, by PD vintage and PD *Kt/V*, 2015

PD *Kt/V*	< 1	1 ≤, < 2	2 ≤, < 4	4 ≤, < 6	6 ≤, < 8	8 ≤	Subtotal	No information available	Total	Mean	S.D.
< 0.4 (%)	41 (23.6)	45 (25.9)	53 (30.5)	17 (9.8)	15 (8.6)	3 (1.7)	174 (100.0)	1	175	2.16	2.13
0.4 ≤, < 0.8 (%)	66 (33.0)	57 (28.5)	41 (20.5)	19 (9.5)	9 (4.5)	8 (4.0)	200 (100.0)	1	201	1.86	2.33
0.8 ≤, < 1.2 (%)	136 (29.6)	127 (27.6)	137 (29.8)	48 (10.4)	10 (2.2)	2 (0.4)	460 (100.0)	10	470	1.63	1.63
1.2 ≤, < 1.6 (%)	92 (17.8)	134 (25.9)	186 (36.0)	69 (13.3)	21 (4.1)	15 (2.9)	517 (100.0)	19	536	2.28	2.18
1.6 ≤, < 2.0 (%)	53 (14.6)	73 (20.1)	106 (29.1)	70 (19.2)	35 (9.6)	27 (7.4)	364 (100.0)	25	389	3.23	3.19
2.0 ≤ (%)	41 (20.2)	34 (16.7)	61 (30.0)	34 (16.7)	16 (7.9)	17 (8.4)	203 (100.0)	4	207	2.97	2.94
Subtotal (%)	429 (22.4)	470 (24.5)	584 (30.4)	257 (13.4)	106 (5.5)	72 (3.8)	1918 (100.0)	60	1978	2.32	2.46
No information available (%)	897 (32.1)	597 (21.4)	685 (24.5)	348 (12.5)	130 (4.7)	137 (4.9)	2794 (100.0)	2332	5126	2.20	2.78
Total (%)	1326 (28.1)	1067 (22.6)	1269 (26.9)	605 (12.8)	236 (5.0)	209 (4.4)	4712 (100.0)	2392	7104	2.25	2.66
Mean	1.16	1.17	1.29	1.38	1.37	1.56	1.26	1.5	1.26		
S.D.	0.67	0.56	0.64	0.6	0.72	0.6	0.64	0.38	0.63		

Values in parentheses under each figure represent the percentage relative to the subtotal in each row

Table 69 History of PET, 2015

	Not performed	Standard PET	Fast PET	Subtotal	Unspecified	No information available	Total
Patients	1542	2020	894	4456	99	2549	7104

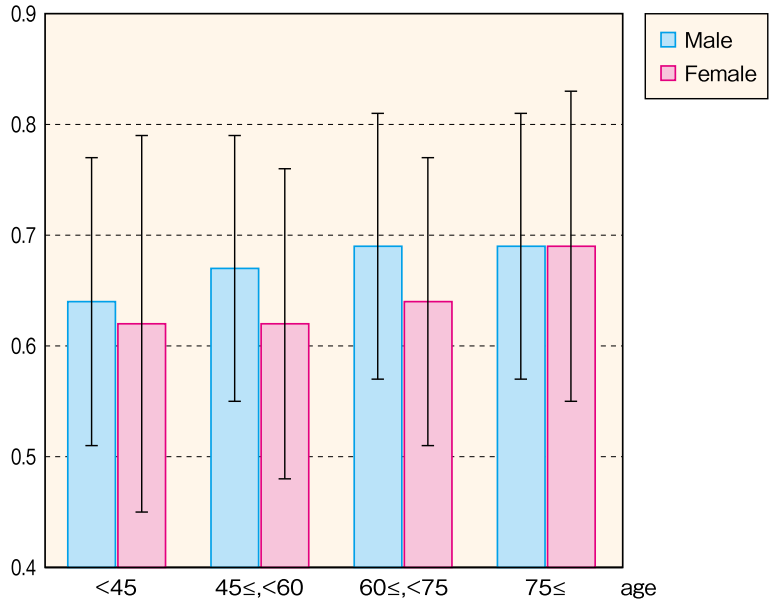

Fig. 64 D/P Cr ratio, by age and sex, 2015. Abbreviation: D/P Cr ratio, dialysate/plasma creatinine ratio

Table 70 D/P Cr ratio, by age and sex, 2015

		< 45	45 ≤, < 60	60 ≤, < 75	75 ≤	Subtotal
Male	Mean	0.64	0.67	0.69	0.69	0.68
	S.D.	0.13	0.12	0.12	0.13	0.12
Female	Mean	0.62	0.62	0.64	0.69	0.64
	S.D.	0.17	0.14	0.13	0.14	0.14

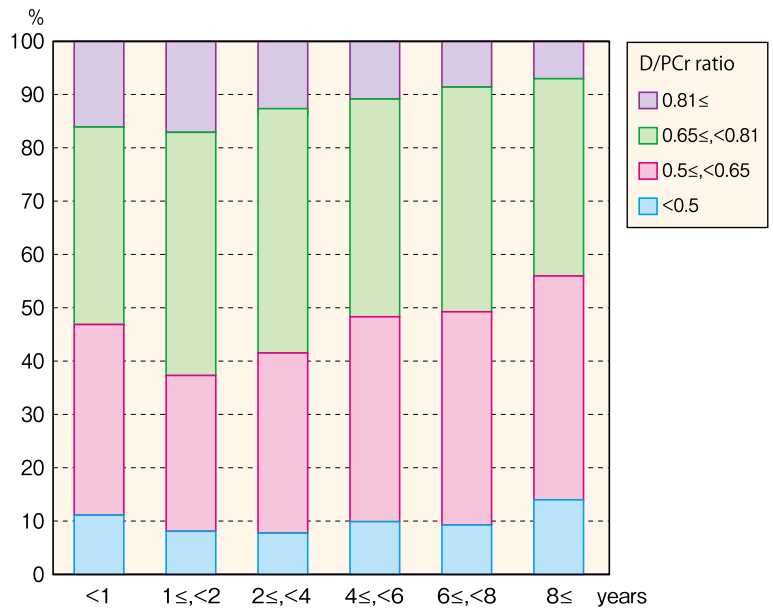

Fig. 65 Prevalent PD patient distribution, by PD vintage and D/P Cr ratio, 2015. Abbreviation: D/P Cr ratio, dialysate/plasma creatinine ratio

Table 71 Patient distribution, by PD vintage and D/P Cr ratio, 2015

D/P Cr ratio	< 1	1 ≤, < 2	2 ≤, < 4	4 ≤, < 6	6 ≤, < 8	8 ≤	Subtotal	No information available	Total	Mean	S.D.
< 0.5 (%)	52 (23.6)	48 (21.8)	60 (27.3)	33 (15.0)	13 (5.9)	14 (6.4)	220 (100.0)	1	221	2.60	2.89
0.5 ≤, < 0.65 (%)	167 (20.2)	173 (20.9)	261 (31.6)	128 (15.5)	56 (6.8)	42 (5.1)	827 (100.0)	26	853	2.63	2.69
0.65 ≤, < 0.81 (%)	173 (16.8)	270 (26.2)	354 (34.4)	136 (13.2)	59 (5.7)	37 (3.6)	1029 (100.0)	39	1068	2.46	2.56
0.81 ≤ (%)	75 (22.3)	101 (30.0)	106 (31.5)	36 (10.7)	12 (3.6)	7 (2.1)	337 (100.0)	7	344	1.99	2.17
Subtotal (%)	467 (19.4)	592 (24.5)	781 (32.4)	333 (13.8)	140 (5.8)	100 (4.1)	2413 (100.0)	73	2486	2.46	2.59
No information available (%)	859 (37.4)	475 (20.7)	488 (21.2)	272 (11.8)	96 (4.2)	109 (4.7)	2299 (100.0)	2319	4618	2.02	2.71
Total (%)	1326 (28.1)	1067 (22.6)	1269 (26.9)	605 (12.8)	236 (5.0)	209 (4.4)	4712 (100.0)	2392	7104	2.25	2.66
Mean	0.66	0.68	0.67	0.65	0.64	0.62	0.66	0.67	0.66		
S.D.	0.14	0.14	0.12	0.13	0.13	0.14	0.13	0.1	0.13		

Values in parentheses under each figure represent the percentage relative to the subtotal in each row

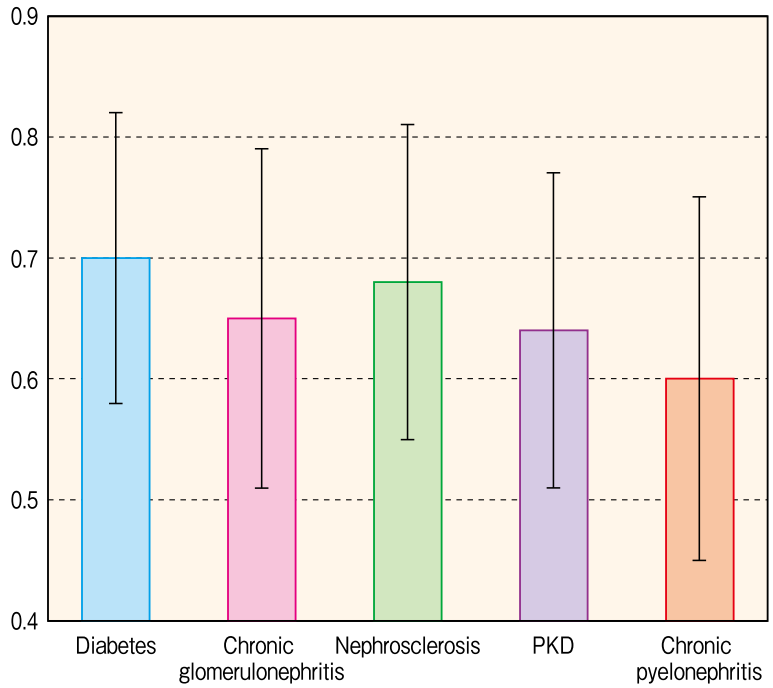

Fig. 66 D/P Cr ratio, by primary disease, 2015. Abbreviation: D/P Cr ratio, dialysate/plasma creatinine ratio

Table 72 Prevalent PD patient distribution, by primary disease and D/P Cr ratio, 2015

Primary disease	< 0.5	0.5 ≤, < 0.65	0.65 ≤, < 0.81	0.81 ≤	Subtotal	No information available	Total	Mean	S.D.
Diabetes	30	227	341	145	743	1583	2326	0.70	0.12
Chronic glomerulonephritis	91	320	342	98	851	1295	2146	0.65	0.14
Nephrosclerosis	25	94	145	49	313	630	943	0.68	0.13
PKD	9	36	29	8	82	143	225	0.64	0.13
Chronic pyelonephritis	7	9	11	2	29	49	78	0.60	0.15
Others	59	167	200	42	468	918	1386		
Subtotal	221	853	1068	344	2486	4618	7104	0.66	0.13
No information available								0	0
Total	221	853	1068	344	2486	4618	7104	0.66	0.13

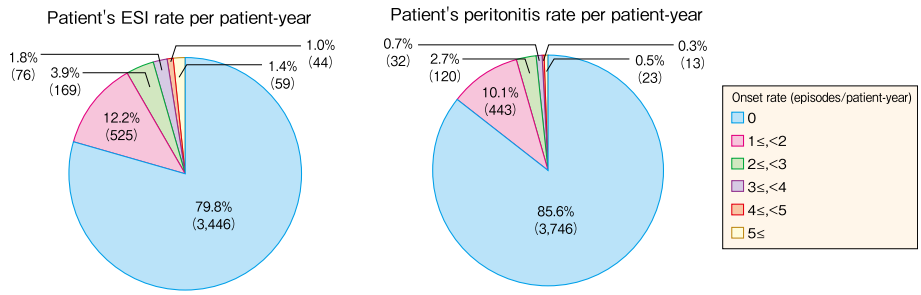

Fig. 67 Prevalent PD patient distribution, by onset of ESI and peritonitis, 2015. Abbreviation: ESI, exit-site infection

Table 73 Patient's ESI and peritonitis rate, 2015

	0	1.0≤, < 2.0	2.0≤, < 3.0	3.0≤, < 4.0	4.0≤, < 5.0	5.0≤	Subtotal	Unspecified/no information available	Total	Mean
Incidence rates of exit-site infection per single patient (per patient-year)										
Patients (%)	3446 (79.8)	525 (12.2)	169 (3.9)	76 (1.8)	44 (1.0)	59 (1.4)	4319 (100.0)	2785	7104	0.40
Patients classified in the "0" category denote that they did not experience any exit-site infection during the year										
Incidence rates of peritonitis per single patient (per patient-year)										
Patients (%)	3746 (85.6)	443 (10.1)	120 (2.7)	32 (0.7)	13 (0.3)	23 (0.5)	4377 (100.0)	2727	7104	0.24
Patients classified in the "0" category denote that they did not experience any peritonitis during the year										

Values in parentheses under each figure represent the percentage relative to the subtotal in each row

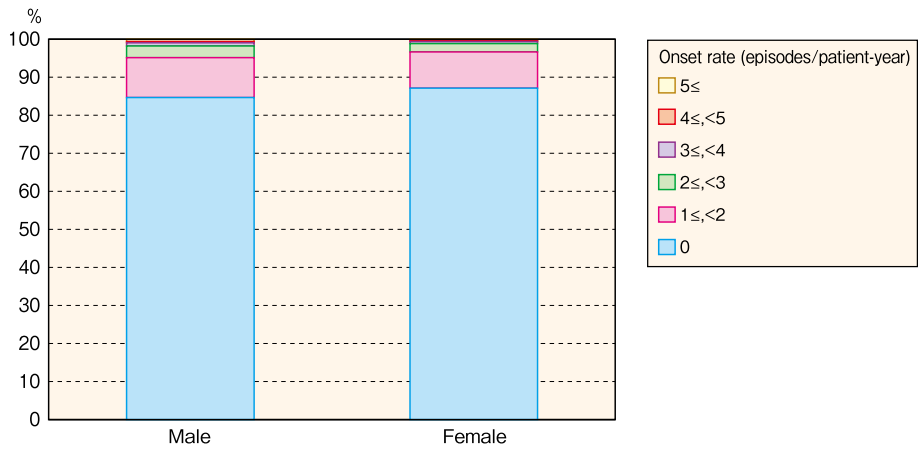

Fig. 68 Patient's peritonitis rate, by sex, 2015

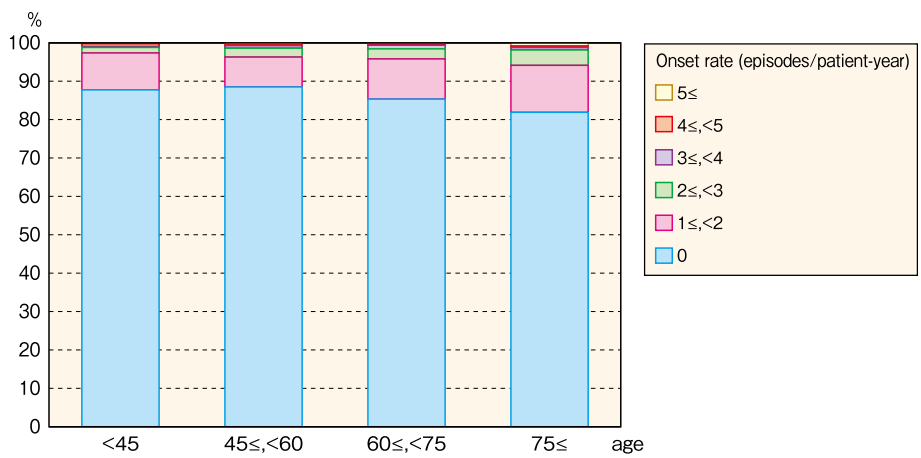

Fig. 69 Patient's peritonitis rate, by age, 2015

Table 74 Patient's peritonitis rate, by sex, 2015

Sex	0	1.0≤, < 2.0	2.0≤, < 3.0	3.0≤, < 4.0	4.0≤, < 5.0	5.0≤	Subtotal	Unspecified/no information available	Total	Mean
Male (%)	2318 (84.7)	287 (10.5)	84 (3.1)	23 (0.8)	9 (0.3)	17 (0.6)	2738 (100.0)	1762	4500	0.27
Female (%)	1428 (87.1)	156 (9.5)	36 (2.2)	9 (0.5)	4 (0.2)	6 (0.4)	1639 (100.0)	965	2604	0.2
Subtotal (%)	3746 (85.6)	443 (10.1)	120 (2.7)	32 (0.7)	13 (0.3)	23 (0.5)	4377 (100.0)	2727	7104	0.24
No information available (%)										
Total (%)	3746 (85.6)	443 (10.1)	120 (2.7)	32 (0.7)	13 (0.3)	23 (0.5)	4377 (100.0)	2727	7104	0.24

Values in parentheses under each figure represent the percentage relative to the subtotal in each row

Table 75 Patient's peritonitis rate, by age, 2015

	0	1.0≤, < 2.0	2.0≤, < 3.0	3.0≤, < 4.0	4.0≤, < 5.0	5.0≤	Subtotal	Unspecified/no information available	Total	Mean	S.D.
< 15 (%)	51 (85.0)	6 (10.0)	2 (3.3)	1 (1.7)			60 (100.0)	29	89	0.23	0.64
15≤, < 30 (%)	50 (87.7)	6 (10.5)			1 (1.8)		57 (100.0)	31	88	0.20	0.70
30≤, < 45 (%)	264 (88.3)	28 (9.4)	4 (1.3)		2 (0.7)	1 (0.3)	299 (100.0)	204	503	0.18	0.65
45≤, < 60 (%)	955 (88.5)	84 (7.8)	25 (2.3)	7 (0.6)	2 (0.2)	6 (0.6)	1079 (100.0)	647	1726	0.20	0.76
60≤, < 75 (%)	1630 (85.3)	200 (10.5)	50 (2.6)	18 (0.9)	4 (0.2)	8 (0.4)	1910 (100.0)	1167	3077	0.25	0.93
75≤, < 90 (%)	733 (81.6)	112 (12.5)	36 (4.0)	5 (0.6)	4 (0.4)	8 (0.9)	898 (100.0)	598	1496	0.31	0.84
90≤ (%)	63 (85.1)	7 (9.5)	3 (4.1)	1 (1.4)			74 (100.0)	51	125	0.23	0.61
Subtotal (%)	3746 (85.6)	443 (10.1)	120 (2.7)	32 (0.7)	13 (0.3)	23 (0.5)	4377 (100.0)	2727	7104	0.24	0.84
No information available (%)											
Total (%)	3746 (85.6)	443 (10.1)	120 (2.7)	32 (0.7)	13 (0.3)	23 (0.5)	4377 (100.0)	2727	7104	0.24	0.84
Mean	62.99	65.00	67.38	65.59	61.00	66.17	63.34	63.77	63.50		
S.D.	15.14	15.33	14.63	14.89	17.79	12.98	15.16	14.98	15.09		

Values in parentheses under each figure represent the percentage relative to the subtotal in each row

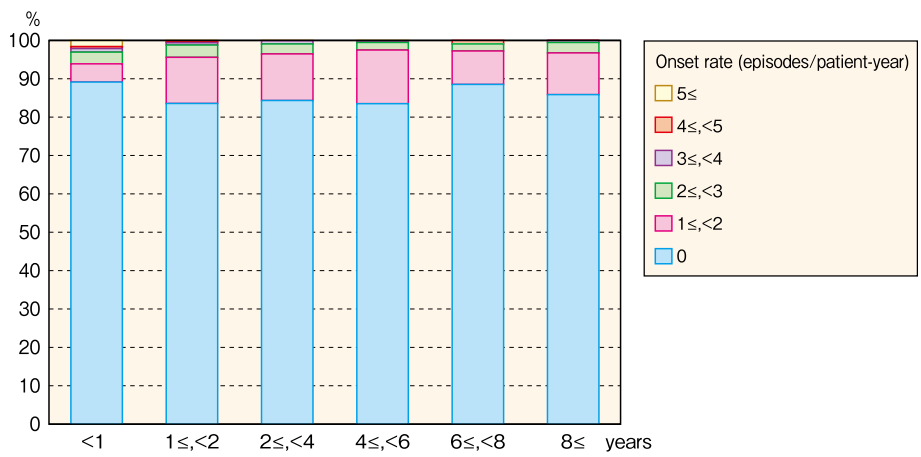

Fig. 70 Patient's peritonitis rate, by PD vintage, 2015

Table 76 Patient's peritonitis rate, by PD vintage, 2015

PD vintage	0	1.0 ≤, < 2.0	2.0 ≤, < 3.0	3.0 ≤, < 4.0	4.0 ≤, < 5.0	5.0 ≤	Subtotal	Unspecified/no information available	Total	Mean	S.D.
< 1 (%)	1051 (89.1)	56 (4.7)	36 (3.1)	11 (0.9)	6 (0.5)	19 (1.6)	1179 (100.0)	147	1326	0.32	1.20
1 ≤, < 2 (%)	834 (83.6)	120 (12.0)	32 (3.2)	6 (0.6)	4 (0.4)	2 (0.2)	998 (100.0)	69	1067	0.23	0.60
2 ≤, < 4 (%)	1007 (84.3)	145 (12.1)	31 (2.6)	10 (0.8)		1 (0.1)	1194 (100.0)	75	1269	0.22	0.79
4 ≤, < 6 (%)	466 (83.5)	78 (14.0)	11 (2.0)	1 (0.2)	1 (0.2)	1 (0.2)	558 (100.0)	47	605	0.20	0.52
6 ≤, < 8 (%)	193 (88.5)	19 (8.7)	4 (1.8)		2 (0.9)		218 (100.0)	18	236	0.16	0.53
8 ≤, < 10 (%)	76 (85.4)	11 (12.4)	2 (2.2)				89 (100.0)	12	101	0.17	0.43
10 ≤ (%)	82 (86.3)	9 (9.5)	3 (3.2)	1 (1.1)			95 (100.0)	13	108	0.19	0.53
Subtotal (%)	3709 (85.6)	438 (10.1)	119 (2.7)	29 (0.7)	13 (0.3)	23 (0.5)	4331 (100.0)	381	4712	0.24	0.84
No information available (%)	37 (80.4)	5 (10.9)	1 (2.2)	3 (6.5)			46 (100.0)	2346	2392	0.36	0.84
Total (%)	3746 (85.6)	443 (10.1)	120 (2.7)	32 (0.7)	13 (0.3)	23 (0.5)	4377 (100.0)	2727	7104	0.24	0.84
Mean	2.67	3.06	2.44	2.02	2.06	0.68	2.68	2.54	2.67		
S.D.	2.65	2.44	2.30	2.14	2.45	1.06	2.62	2.91	2.65		

Values in parentheses under each figure represent the percentage relative to the subtotal in each row

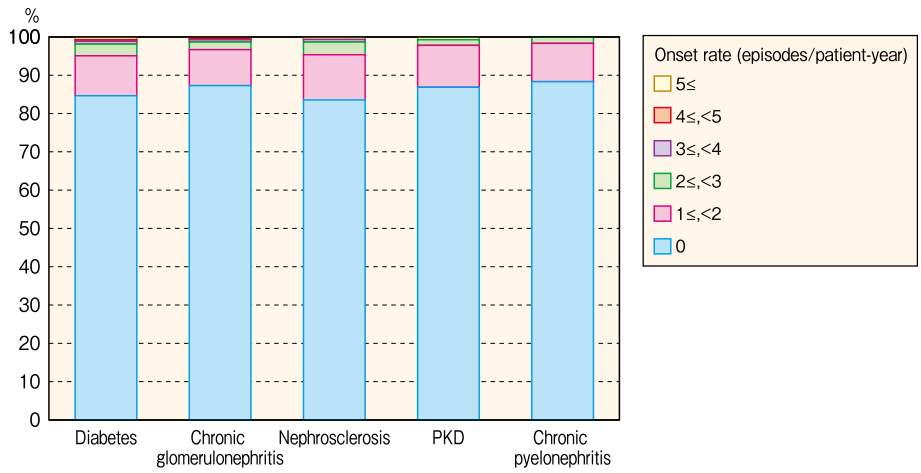

Fig. 71 Patient's peritonitis rate, by primary disease, 2015

Table 77 Patient's peritonitis rate, by primary disease, 2015

Primary disease	0	1.0 ≤, < 2.0	2.0 ≤, < 3.0	3.0 ≤, < 4.0	4.0 ≤, < 5.0	5.0 ≤	Subtotal	Unspecified/no information available	Total	Mean	S.D.
Diabetes (%)	1169 (84.6)	144 (10.4)	42 (3.0)	10 (0.7)	6 (0.4)	10 (0.7)	1381 (100.0)	945	2326	0.27	0.88
Chronic glomerulonephritis (%)	1181 (87.3)	127 (9.4)	27 (2.0)	8 (0.6)	5 (0.4)	5 (0.4)	1353 (100.0)	793	2146	0.21	0.86
Nephrosclerosis (%)	503 (83.6)	71 (11.8)	20 (3.3)	4 (0.7)		4 (0.7)	602 (100.0)	341	943	0.26	0.84
PKD (%)	119 (86.9)	15 (10.9)	2 (1.5)			1 (0.7)	137 (100.0)	88	225	0.19	0.64
Chronic pyelonephritis (%)	53 (88.3)	6 (10.0)	1 (1.7)				60 (100.0)	18	78	0.15	0.44
Others (%)	721 (85.4)	80 (9.5)	28 (3.3)	10 (1.2)	2 (0.2)	3 (0.4)	844 (100.0)	542	1386		
Subtotal (%)	3746 (85.6)	443 (10.1)	120 (2.7)	32 (0.7)	13 (0.3)	23 (0.5)	4377 (100.0)	2727	7104	0.24	0.84
No information available (%)											
Total (%)	3746 (85.6)	443 (10.1)	120 (2.7)	32 (0.7)	13 (0.3)	23 (0.5)	4377 (100.0)	2727	7104	0.24	0.84

Values in parentheses under each figure represent the percentage relative to the subtotal in each row

Table 78 Patient with EPS history distribution, by treatment for EPS, 2015

EPS history	No history of EPS	EPS with history of surgical intervention and steroidal use	EPS with history of surgical intervention but without steroid	EPS without surgical intervention but with steroidal use	EPS without surgical intervention or steroidal use	Subtotal	Unspecified	No information available	Total
Patients	12,355	513	26	74	65	13,033	278	3895	17,206

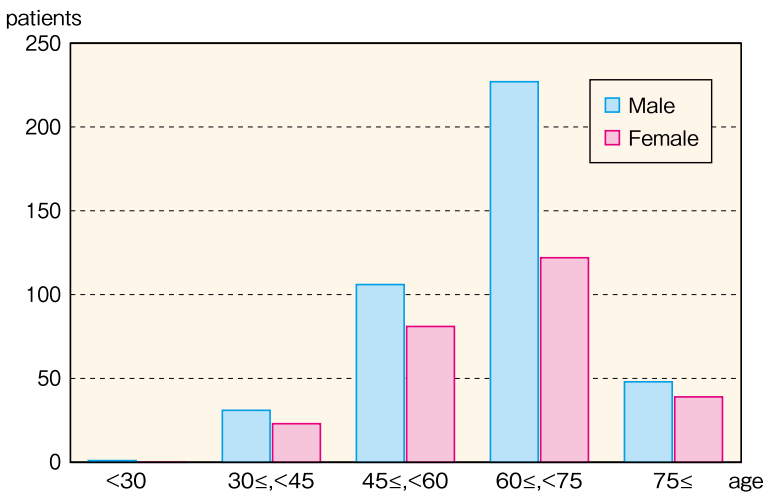

Fig. 72 Patient with EPS history distribution, by age and sex. Abbreviation: EPS, encapsulating peritoneal sclerosis

Table 79 Patient with EPS history distribution, by age and sex, 2015

Sex	< 30	30 ≤, < 45	45 ≤, < 60	60 ≤, < 75	75 ≤	Subtotal	No information available	Total	Mean	S.D.
Male (%)	1 (0.2)	31 (7.5)	106 (25.7)	227 (55.0)	48 (11.6)	413 (100.0)		413	62.56	11.54
Female (%)		23 (8.7)	81 (30.6)	122 (46.0)	39 (14.7)	265 (100.0)		265	61.91	12.17
Subtotal (%)	1 (0.1)	54 (8.0)	187 (27.6)	349 (51.5)	87 (12.8)	678 (100.0)		678	62.3	11.78
No information available (%)									0	0
Total (%)	1 (0.1)	54 (8.0)	187 (27.6)	349 (51.5)	87 (12.8)	678 (100.0)		678	62.3	11.78

Values in parentheses under each figure represent the percentage relative to the subtotal in each row

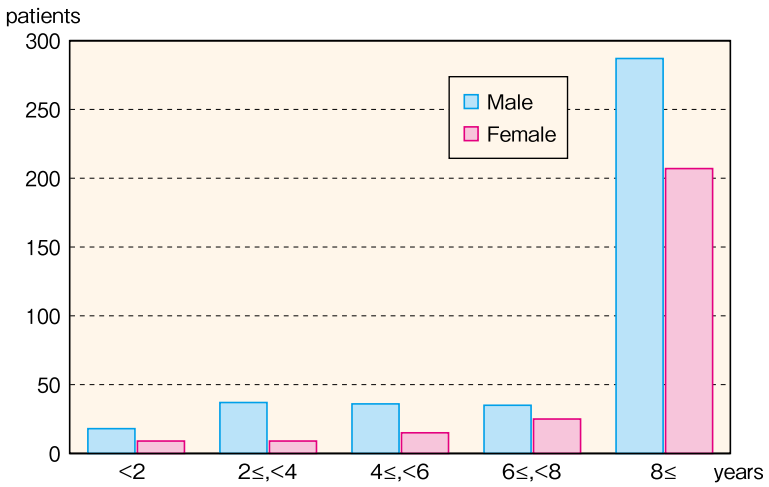

Fig. 73 Patient with EPS history distribution, by dialysis vintage and sex, 2015. Abbreviation: EPS, encapsulating peritoneal sclerosis

Table 80 Patient with EPS history distribution, by dialysis vintage and sex, 2015

Sex	< 2	2 ≤, < 4	4 ≤, < 6	6 ≤, < 8	8 ≤	Subtotal	No information available	Total	Mean	S.D.
Male (%)	18 (4.4)	37 (9.0)	36 (8.7)	35 (8.5)	287 (69.5)	413 (100.0)		413	12.6	7.87
Female (%)	9 (3.4)	9 (3.4)	15 (5.7)	25 (9.4)	207 (78.1)	265 (100.0)		265	15	8.02
Subtotal (%)	27 (4.0)	46 (6.8)	51 (7.5)	60 (8.8)	494 (72.9)	678 (100.0)		678	13.54	8.01
No information available (%)									0	0
Total (%)	27 (4.0)	46 (6.8)	51 (7.5)	60 (8.8)	494 (72.9)	678 (100.0)		678	13.54	8.01

Values in parentheses under each figure represent the percentage relative to the subtotal in each row

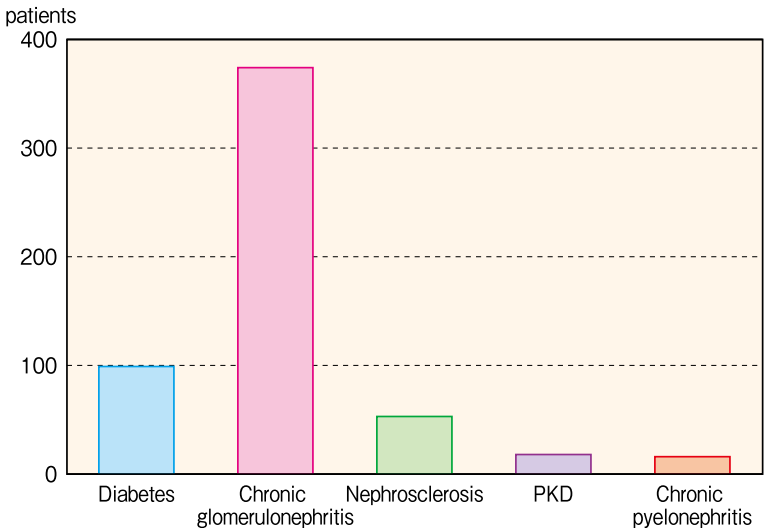

Fig. 74 Patient with EPS history distribution, by primary disease, 2015. Abbreviations: EPS, encapsulating peritoneal sclerosis; PKD, polycystic kidney disease

Table 81 Patient with EPS history distribution, by primary disease and sex, 2015

Primary disease	Male	Female	Subtotal	No information available	Total
Chronic glomerulonephritis (%)	221 (53.5)	153 (57.7)	374 (55.2)		374 (55.2)
Chronic pyelonephritis (%)	8 (1.9)	8 (3.0)	16 (2.4)		16 (2.4)
RPGN (%)	1 (0.2)		1 (0.1)		1 (0.1)
PIH (%)	(0.0)	9 (100.0)	9 (100.0)		9
Unclassified nephritis (%)	3 (0.7)	1 (0.4)	4 (0.6)		4 (0.6)
PKD (%)	12 (2.9)	6 (2.3)	18 (2.7)		18 (2.7)
Nephrosclerosis (%)	37 (9.0)	16 (6.0)	53 (7.8)		53 (7.8)
Hypertensive emergencies (%)	5 (1.2)	1 (0.4)	6 (0.9)		6 (0.9)
Diabetes (%)	73 (17.7)	26 (9.8)	99 (14.6)		99 (14.6)
Lupus nephritis (%)	1 (0.2)	6 (2.3)	7 (1.0)		7 (1.0)
Amyloidosis (%)		1 (0.4)	1 (0.1)		1 (0.1)
Gout (%)	2 (0.5)		2 (0.3)		2 (0.3)
Inborn errors of metabolism (%)	1 (0.2)		1 (0.1)		1 (0.1)
Tuberculosis (%)					
Urolithiasis (%)					
Neoplasm of kidney and urinary tract (%)	2 (0.5)	1 (0.4)	3 (0.4)		3 (0.4)
Urinary tract obstruction (%)					
Myeloma (%)					
Hypoplastic kidney (%)	2 (0.5)	6 (2.3)	8 (1.2)		8 (1.2)
Unspecified (%)	31 (7.5)	17 (6.4)	48 (7.1)		48 (7.1)
Rejected kidney (%)	4 (1.0)	4 (1.5)	8 (1.2)		8 (1.2)
Others (%)	10 (2.4)	10 (3.8)	20 (2.9)		20 (2.9)
Subtotal (%)	413 (100.0)	265 (100.0)	678 (100.0)		678 (100.0)
No information available					
Total	413	265	678		678

Values in parentheses under each figure represent the percentage relative to the total in each column

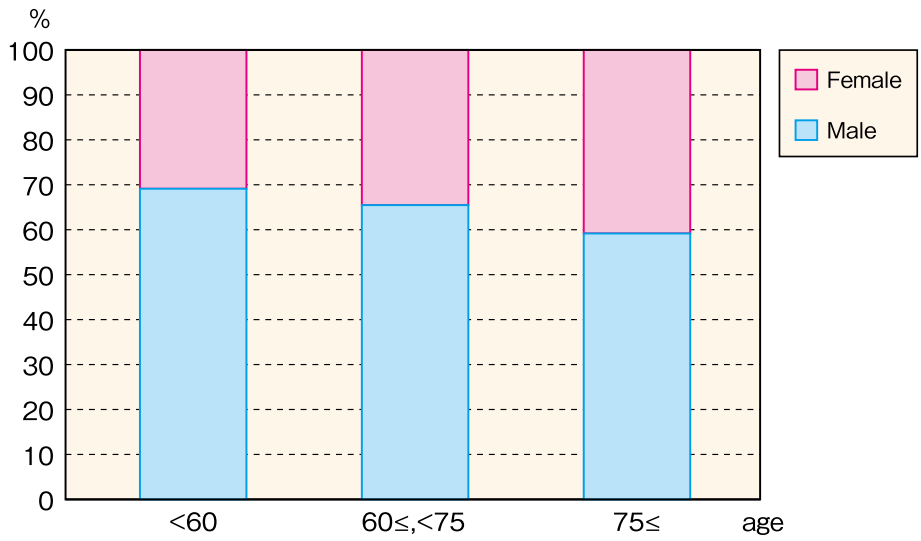

Fig. 75 Prevalent dialysis patient distribution, by age and sex, 2015

Table 82 Prevalent dialysis patient distribution, by age and sex, 2015

Sex	< 60	60 ≤,< 75	75 ≤	Subtotal	No information available	Total	Mean	S.D.
Male	49,259	92,729	59,346	201,334	3	201,337	67.07	12.37
Female	22,011	48,905	40,962	111,878	2	111,880	69.28	12.58
Subtotal	71,270	141,634	100,308	313,212	5	313,217	67.86	12.49
No information available								
Total	71,270	141,634	100,308	313,212	5	313,217	67.86	12.49

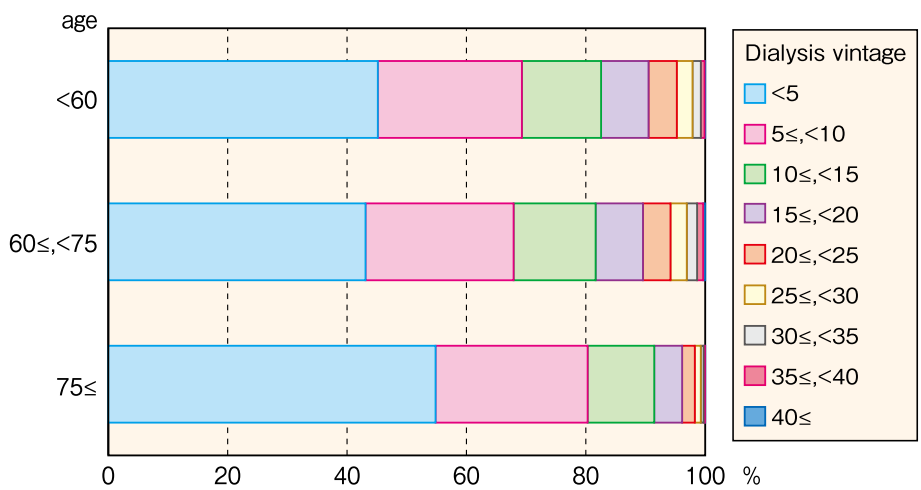

Fig. 76 Prevalent dialysis patient distribution, by age and dialysis vintage, 2015

Table 83 Prevalent dialysis patient distribution, by age and dialysis vintage, 2015

Dialysis vintage	< 60	60 ≤,< 75	75 ≤	Subtotal	No information available	Total	Mean	S.D.
< 5	32,140	60,964	54,911	148,015	2	148,017	68.79	13.05
5 ≤, < 10	17,178	35,102	25,520	77,800	1	77,801	68.18	12.44
10 ≤, < 15	9444	19,440	11,176	40,060		40,060	66.98	11.97
15 ≤, < 20	5655	11,221	4679	21,555		21,555	65.56	11.44
20 ≤, < 25	3375	6528	2128	12,031		12,031	64.75	10.78
25 ≤, < 30	1869	3858	1003	6730		6730	64.69	9.76
30 ≤, < 35	994	2448	475	3917		3917	64.64	8.76
35 ≤, < 40	441	1431	224	2096		2096	65.24	7.28
40 ≤	82	489	46	617		617	65.95	5.97
Subtotal	71,178	141,481	100,162	312,821	3	312,824	67.86	12.49
No information available	92	153	146	391	2	393	68.35	12.98
Total	71,270	141,634	100,308	313,212	5	313,217	67.86	12.49
Mean	7.78	8.21	5.71	7.31	2.33	7.31		
S.D.	7.76	8.21	6.01	7.55	2.52	7.55		

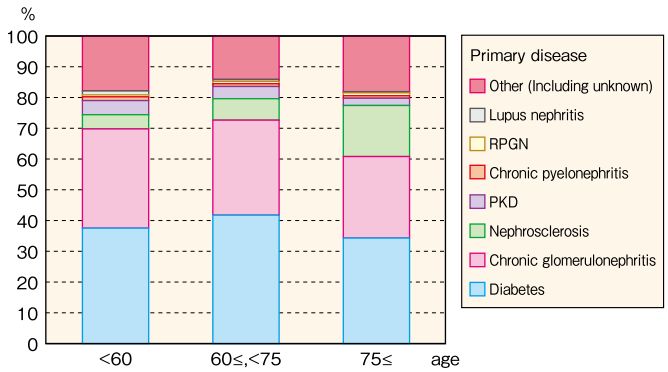

Fig. 77 Prevalent dialysis patient distribution, by age and primary disease, 2015. Abbreviations: RPGN: rapidly progressive glomerulonephritis; PKD, polycystic kidney disease

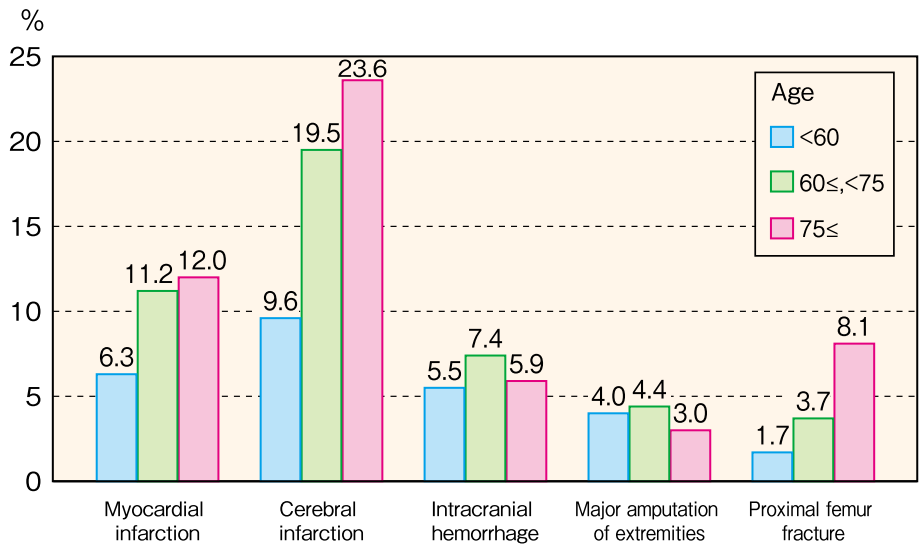

Fig. 78 Prevalent dialysis patient distribution, by comorbidity and age, 2015

Table 84 Prevalent dialysis patient distribution, by age and primary disease, 2015

Primary disease	< 60	60 ≤, < 75	75 ≤	Subtotal	No information available	Total	Mean	S.D.
Diabetes	26,742	59,129	34,405	120,276	2	120,278	67.52	11.33
Chronic glomerulonephritis	22,999	43,758	26,589	93,346	1	93,347	66.90	12.46
Nephrosclerosis	3292	9867	16,646	29,805		29,805	74.25	11.74
PKD	3273	5624	2359	11,256		11,256	65.16	11.37
Chronic pyelonephritis	863	1254	818	2935		2935	65.62	13.84
RPGN	469	1064	945	2478		2478	69.23	12.93
Lupus nephritis	898	932	397	2227		2227	61.64	13.68
Others	12,731	19,996	18,141	50,868	2	50,870		
Subtotal	71,267	141,624	100,300	313,191	5	313,196	67.86	12.49
No information available	3	10	8	21		21	70.52	11.36
Total	71,270	141,634	100,308	313,212	5	313,217	67.86	12.49

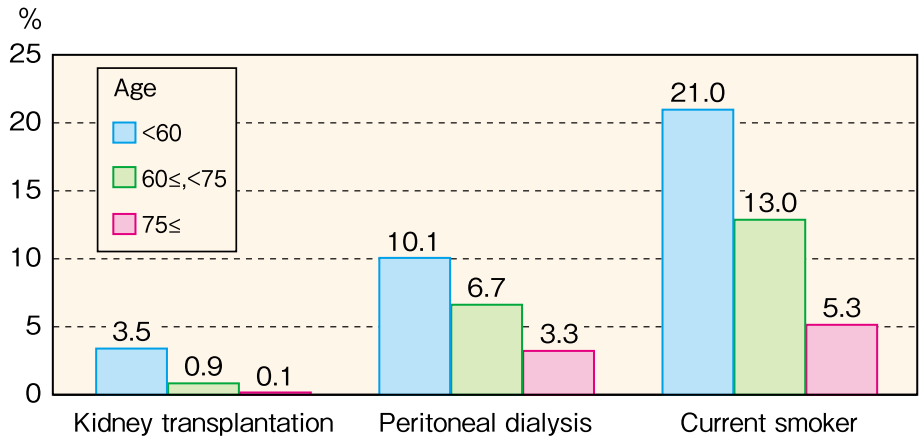

Fig. 79 Prevalent dialysis patient distribution, by history of kidney transplantation and peritoneal dialysis, smoking status and age, 2015

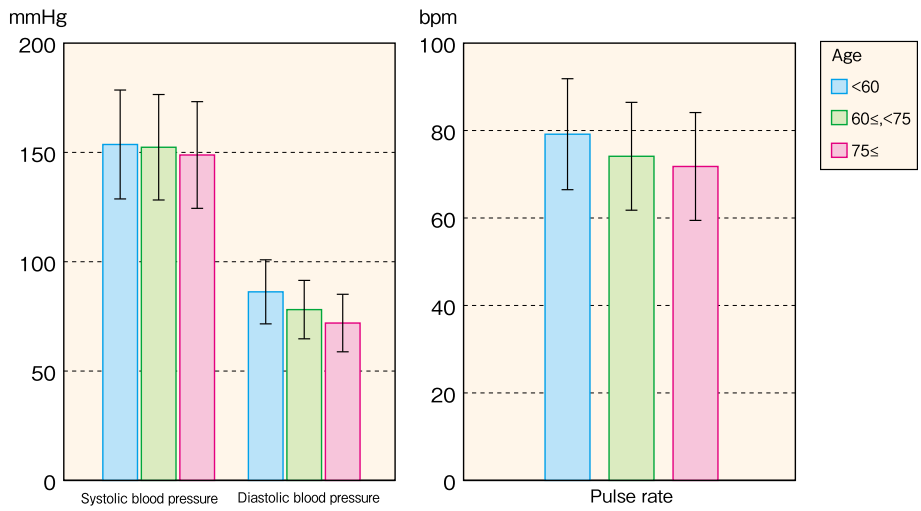

Fig. 80 Blood pressure and pulse rate, by age, 2015

Table 85 Blood pressure and pulse rate, by age, 2015

		< 60	60 ≤, < 75	75 ≤
Systolic blood pressure	Mean	153.62	152.35	148.81
	S.D.	24.90	24.12	24.40
Diastolic blood pressure	Mean	86.23	78.10	71.96
	S.D.	14.65	13.36	13.15
Pulse rate	Mean	79.16	74.11	71.78
	S.D.	12.69	12.33	12.44

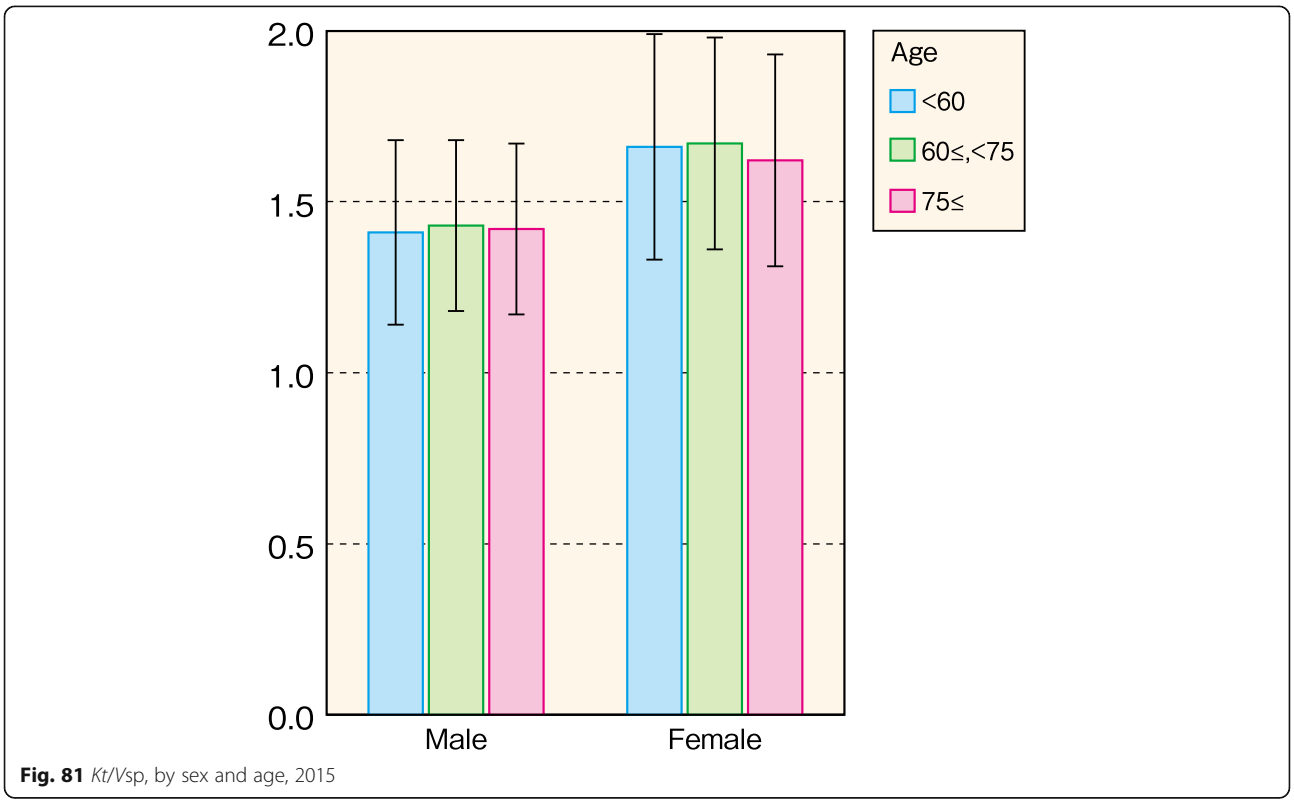

Fig. 81 *Kt/V*sp, by sex and age, 2015

Table 86 *Kt/V*sp, by age and sex, 2015

		< 60	60 ≤, < 75	75 ≤
Male	Mean	1.41	1.43	1.42
	S.D.	0.27	0.25	0.25
Female	Mean	1.66	1.67	1.62
	S.D.	0.33	0.31	0.31

*Kt/V*sp was summarized in the patients with vintages of 2 years or more and receiving dialysis three times a week

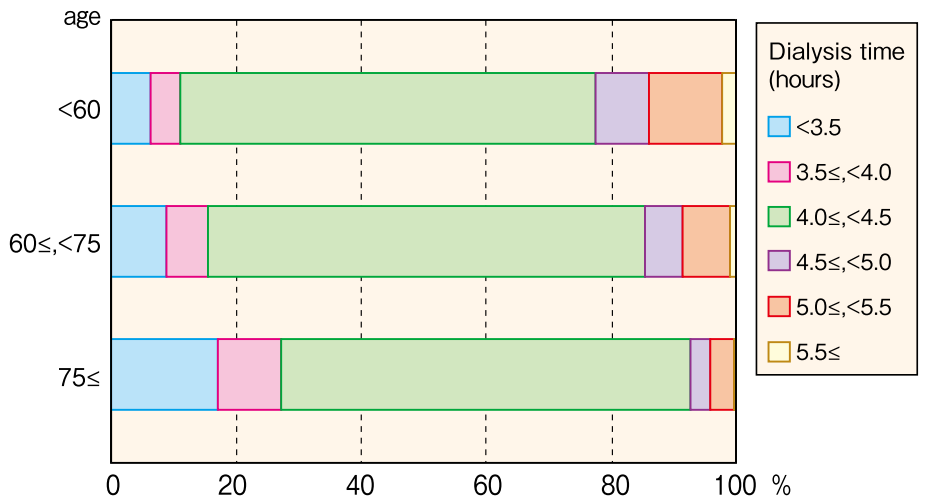

Fig. 82 Prevalent dialysis patient distribution, by age and dialysis time, 2015

Table 87 Prevalent patient distribution, by age and dialysis time, 2015

Dialysis time(hour)	< 60	60 ≤, < 75	75 ≤	Subtotal	Unspecified/no information available	Total	Mean	S.D.
< 3.5	3947	11,187	15,515	30,649	1	30,650	72.96	12.09
3.5 ≤, < 4.0	3142	8734	9277	21,153		21,153	71.35	11.89
4.0 ≤, < 4.5	42,258	89,656	59,453	191,367	2	191,369	67.82	12.09
4.5 ≤, < 5.0	5526	7644	2945	16,115		16,115	63.45	12.18
5.0 ≤, < 5.5	7539	9636	3415	20,590		20,590	62.63	12.36
5.5 ≤	1407	1351	431	3189		3189	60.66	12.53
Subtotal	63,819	128,208	91,036	283,063	3	283,066	67.93	12.41
No information available	7451	13,426	9272	30,149	2	30,151	67.17	13.25
Total	71,270	141,634	100,308	313,212	5	313,217	67.86	12.49
Mean	4.14	4.02	3.85	3.99	3.67	3.99		
S.D.	0.59	0.50	0.50	0.53	0.58	0.53		

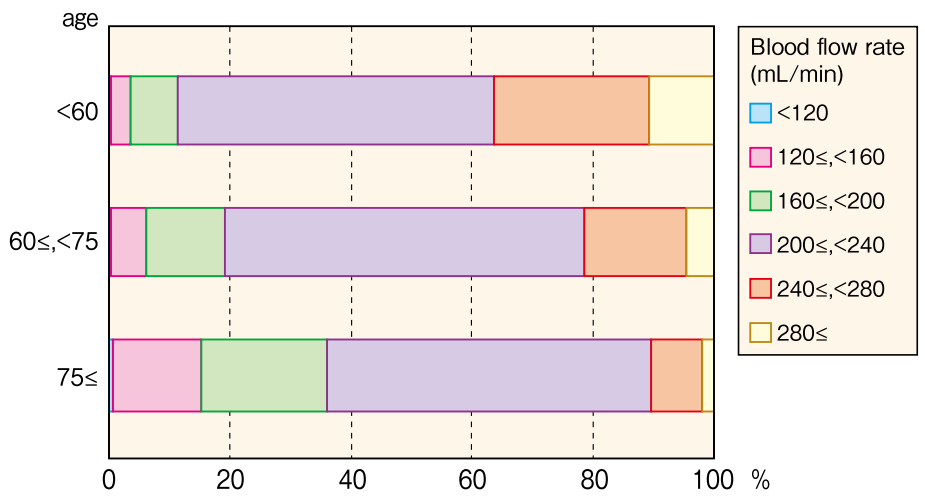

Fig. 83 Prevalent dialysis patient distribution, by age and blood flow rate, 2015

Table 88 Prevalent dialysis patient distribution, by age and blood flow rate, 2015

Blood flow rate	< 60	60 ≤, < 75	75 ≤	Subtotal	Unspecified/no information available	Total	Mean	S.D.
< 120	115	354	528	997		997	73.4	12.65
120 ≤, < 160	2196	7680	13,234	23,110		23,110	74.75	11.59
160 ≤, < 200	4789	16,219	18,643	39,651		39,651	72.42	11.43
200 ≤, < 240	33,098	75,499	48,379	156,976	1	156,977	67.96	11.8
240 ≤, < 280	16,423	21,342	7437	45,202		45,202	62.7	12.12
280 ≤	6602	5776	1701	14,079	1	14,080	59.89	12.25
Subtotal	63,223	126,870	89,922	280,015	2	280,017	67.92	12.41
No information available	8047	14,764	10,386	33,197	3	33,200	67.38	13.19
Total	71,270	141,634	100,308	313,212	5	313,217	67.86	12.49
Mean	224.78	210.69	195.43	208.97	350.00	208.97		
S.D.	40.53	35.94	34.24	38.07	212.13	38.07		

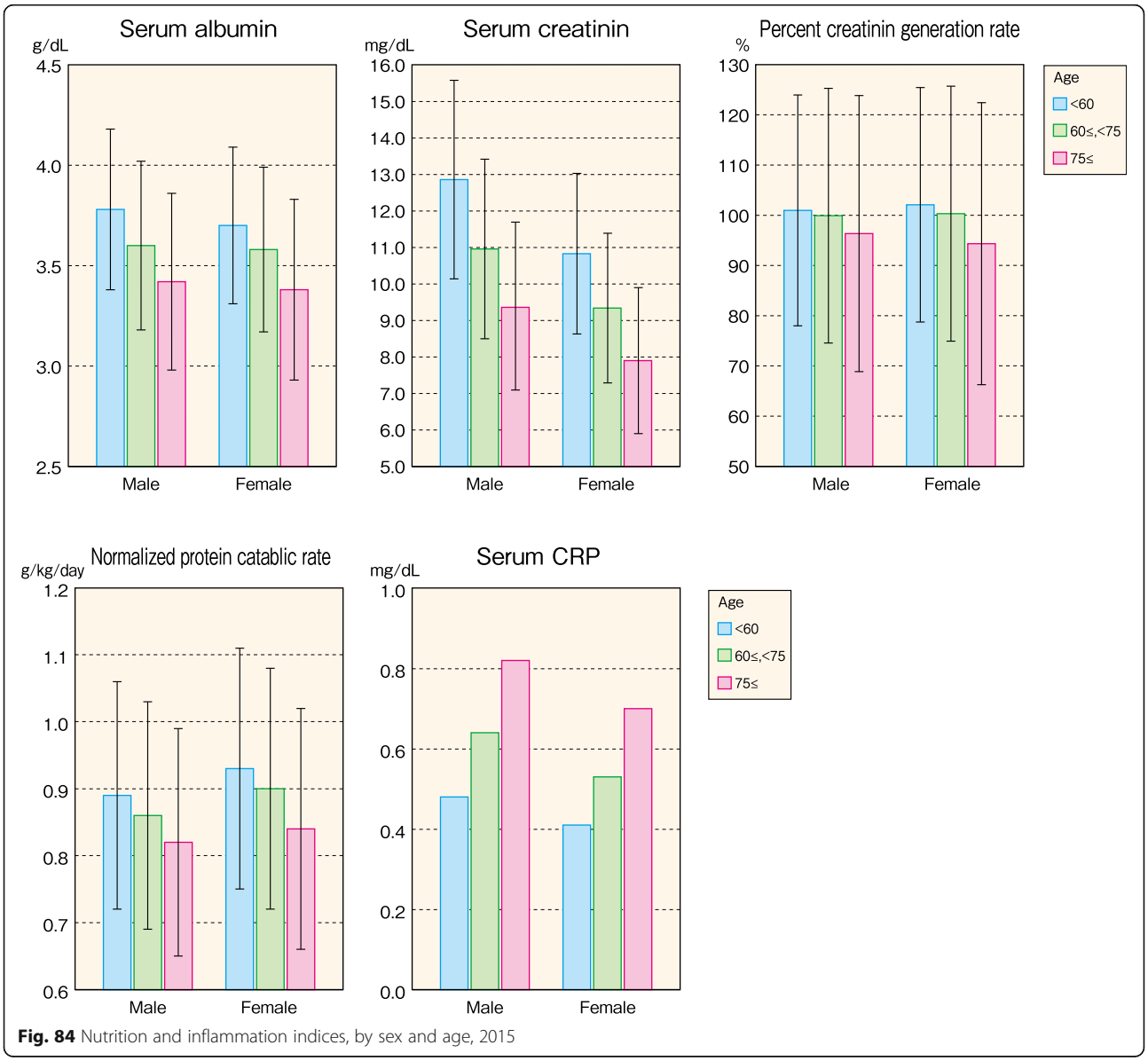

Fig. 84 Nutrition and inflammation indices, by sex and age, 2015

Table 89 Nutrition and inflammation indices, by sex and age, 2015

Serum albumin (g/dL)				
		< 60	60 ≤, < 75	75 ≤
Male	Mean	3.78	3.6	3.42
	S.D.	0.4	0.42	0.44
Female	Mean	3.7	3.58	3.38
	S.D.	0.39	0.41	0.45
Pre-dialysis serum creatinine (mg/dL)[a]				
		< 60	60 ≤, < 75	75 ≤
Male	Mean	12.86	10.96	9.36
	S.D.	2.72	2.46	2.30
Female	Mean	10.83	9.34	7.90
	S.D.	2.20	2.05	2.00
Percent creatinine generation rate(%)[a]				
		< 60	60 ≤, < 75	75 ≤
Male	Mean	100.98	99.93	96.36
	S.D.	22.96	25.33	27.46
Female	Mean	102.1	100.33	94.35
	S.D.	23.32	25.36	28.05
Normalized protein catabolic rate(g/kg/day) [a]				
		< 60	60 ≤, < 75	75 ≤
Male	Mean	0.89	0.86	0.82
	S.D.	0.17	0.17	0.17
Female	Mean	0.93	0.90	0.84
	S.D.	0.18	0.18	0.18
Serum CRP level (mg/dL)				
		< 60	60 ≤, < 75	75 ≤
Male	Mean	0.48	0.64	0.82
	S.D.	1.59	1.86	2.01
Female	Mean	0.41	0.53	0.7
	S.D.	1.43	1.66	1.96

[a]Creatinine concentration, %CGR, and nPCR were summarized in the patients with vintages of 2 years or more and receiving dialysis three times a week

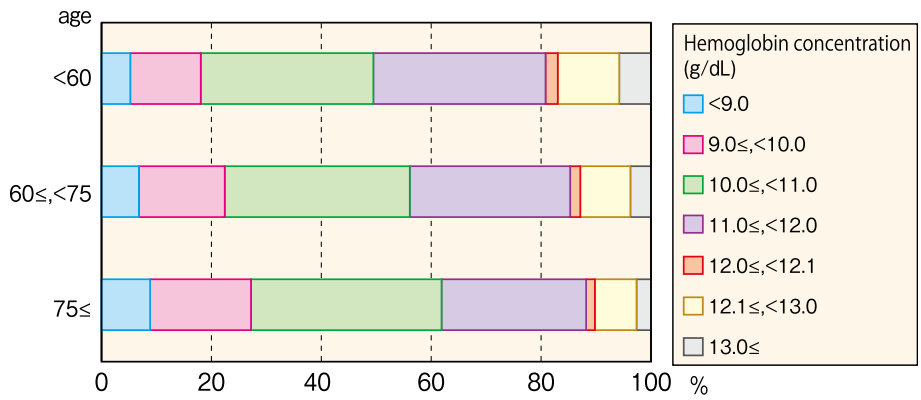

Fig. 85 Prevalent dialysis patient distribution, by age and hemoglobin concentration, 2015

Table 90 Prevalent dialysis patient distribution, by age and hemoglobin concentration, 2015

Hemoglobin concentration	< 60	60 ≤, < 75	75 ≤	Subtotal	Unspecified/no information available	Total	Mean	S.D.
< 9.0	3348	8673	7940	19,961		19,961	70.27	12.21
9.0 ≤, < 10.0	8218	19,957	16,494	44,669	2	44,671	69.53	12.14
10.0 ≤, < 11.0	20,115	42,987	31,141	94,243		94,243	68.30	12.24
11.0 ≤, < 12.0	20,067	37,275	23,636	80,978		80,978	66.99	12.48
12.0 ≤, < 12.1	1427	2347	1436	5210		5210	66.21	12.78
12.1 ≤, < 13.0	7166	11,634	6796	25,596		25,596	65.91	12.74
13.0 ≤	3699	4788	2368	10,855		10,855	64.04	12.84
Subtotal	64,040	127,661	89,811	281,512	2	281,514	67.84	12.46
No information available	7230	13,973	10,497	31,700	3	31,703	68.03	12.82
Total	71,270	141,634	100,308	313,212	5	313,217	67.86	12.49
Mean	10.97	10.77	10.58	10.75	9.60	10.75		
S.D.	1.31	1.27	1.26	1.28	0.28	1.28		

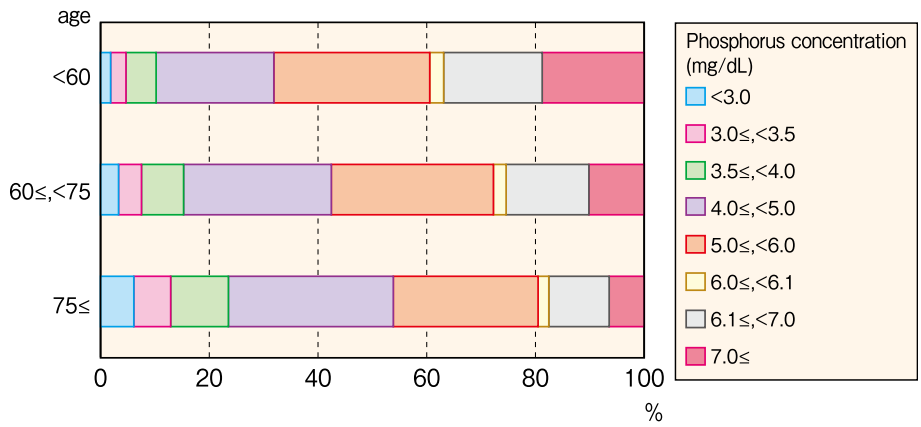

Fig. 86 Prevalent dialysis patient distribution, by age and phosphorus concentration, 2015

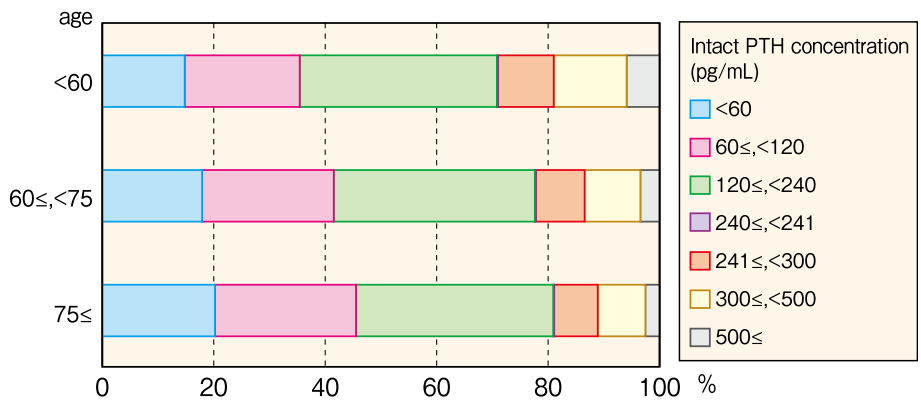

Fig. 87 Prevalent dialysis patient distribution, by age and intact PTH concentration, 2015

Table 91 Prevalent dialysis patient distribution, by age and phosphorus concentration, 2015

Phosphorus concentration	< 60	60 ≤, < 75	75 ≤	Subtotal	Unspecified/no information available	Total	Mean	S.D.
< 3.0	1191	4245	5523	10,959	1	10,960	73.26	11.36
3.0 ≤, < 3.5	1821	5413	6123	13,357		13,357	71.88	11.78
3.5 ≤, < 4.0	3576	9941	9584	23,101		23,101	70.84	11.81
4.0 ≤, < 5.0	13,960	34,877	27,391	76,228		76,228	69.36	11.86
5.0 ≤, < 6.0	18,491	38,269	24,050	80,810		80,810	67.49	12.08
6.0 ≤, < 6.1	1650	2998	1781	6429		6429	66.65	12.36
6.1 ≤, < 7.0	11,687	19,548	10,027	41,262	1	41,263	65.56	12.42
7.0 ≤	12,098	13,055	5818	30,971		30,971	62.37	13.34
Subtotal	64,474	128,346	90,297	283,117	2	283,119	67.84	12.46
No information available	6796	13,288	10,011	30,095	3	30,098	68.09	12.78
Total	71,270	141,634	100,308	313,212	5	313,217	67.86	12.49
Mean	5.73	5.27	4.89	5.25	4.60	5.25		
S.D.	1.56	1.37	1.35	1.44	3.25	1.44		

Table 92 Prevalent dialysis patient distribution, by age and intact PTH concentration, 2015

Intact PTH concentration	< 60	60 ≤, < 75	75 ≤	Subtotal	Unspecified/no information available	Total	Mean	S.D.
< 60	8217	19,826	15,636	43,679	1	43,680	69.26	12.09
60 ≤, < 120	11,467	26,155	19,564	57,186		57,186	68.73	12.07
120 ≤, < 240	19,662	39,949	27,361	86,972		86,972	67.82	12.29
240 ≤, < 241	115	205	134	454		454	66.9	12.56
241 ≤, < 300	5552	9678	6040	21,270		21,270	66.63	12.58
300 ≤, < 500	7267	11,075	6612	24,954		24,954	65.67	12.95
500 ≤	3291	3824	1974	9089		9089	63.25	13.84
Subtotal	55,571	110,712	77,321	243,604	1	243,605	67.8	12.44
No information available	15,699	30,922	22,987	69,608	4	69,612	68.08	12.68
Total	71,270	141,634	100,308	313,212	5	313,217	67.86	12.49
Mean	208.85	176.51	162.00	179.28	16.00	179.28		
S.D.	208.72	164.75	147.92	171.8	0.00	171.8		

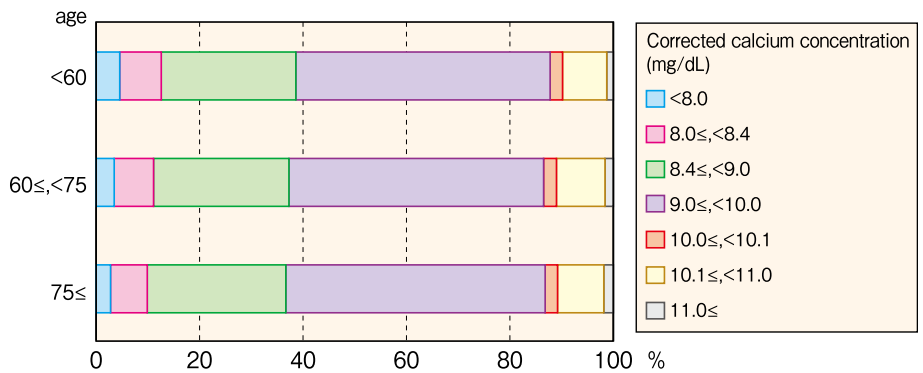

Fig. 88 Prevalent dialysis patient distribution, by age and corrected calcium concentration, 2015

Table 93 Prevalent dialysis patient distribution, by age and corrected calcium concentration, 2015

Corrected calcium concentration	< 60	60 ≤, < 75	75 ≤	Subtotal	Unspecified/no information available	Total	Mean	S.D.
< 8.0	2897	4426	2484	9807		9807	65.32	13.03
8.0 ≤, < 8.4	4606	8560	5607	18,773		18,773	67.13	12.42
8.4 ≤, < 9.0	17,055	34,307	24,678	76,040	1	76,041	67.94	12.45
9.0 ≤, < 10.0	31,271	62,486	44,801	138,558		138,558	67.98	12.46
10 ≤, < 10.1	1527	3158	2141	6826	1	6827	67.87	12.35
10.1 ≤, < 11.0	5438	11,901	7991	25,330		25,330	68.1	12.12
11.0 ≤	811	2054	1650	4515		4515	69.34	12.6
Subtotal	63,605	126,892	89,352	279,849	2	279,851	67.85	12.46
No information available	7665	14,742	10,956	33,363	3	33,366	67.95	12.8
Total	71,270	141,634	100,308	313,212	5	313,217	67.86	12.49
Mean	9.15	9.19	9.20	9.18	9.45	9.18		
S.D.	0.76	0.75	0.74	0.75	0.78	0.75		

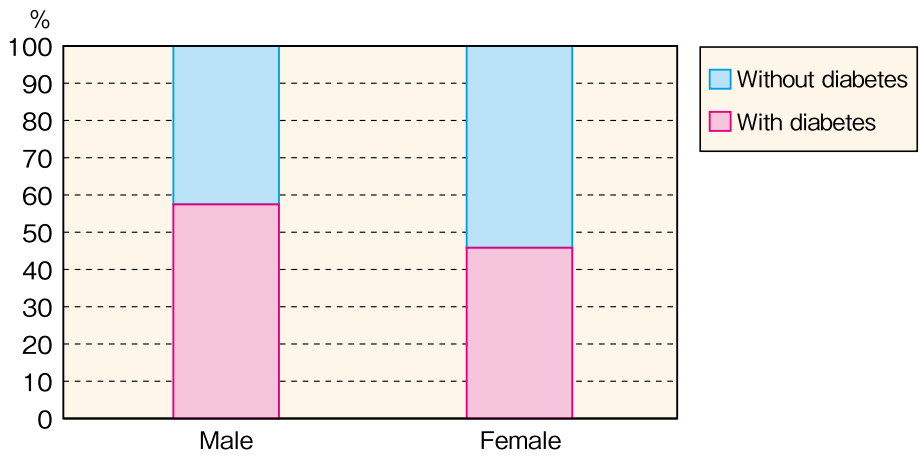

Fig. 89 Prevalent dialysis patient distribution, by sex and presence of diabetes, 2015

Table 94 Prevalent dialysis patient distribution, by sex and presence of diabetes, 2015

Sex	With diabetes	Without diabetes	Subtotal	Unspecified	No information available	Total
Male	101,294	74,966	176,260	25,071	6	201,337
Female	43,576	51,501	95,077	16,802	1	111,880
Subtotal	144,870	126,467	271,337	41,873	7	313,217
No information available						
Total	144,870	126,467	271,337	41,873	7	313,217

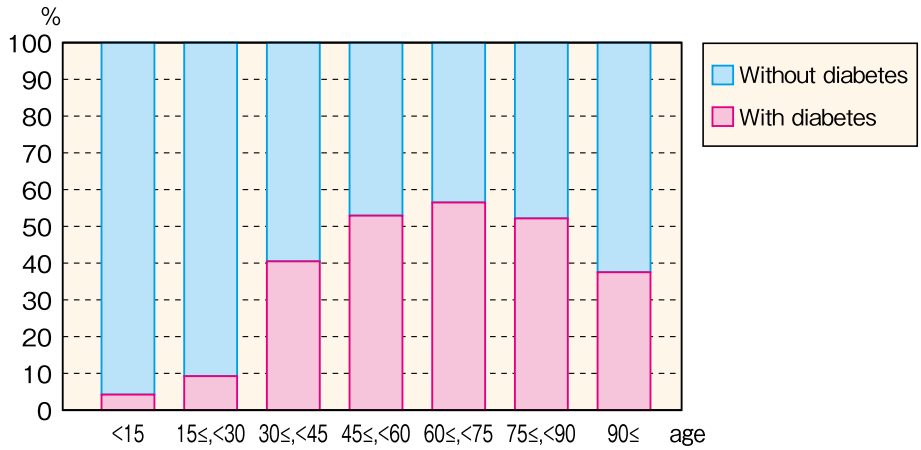

Fig. 90 Patient distribution, by age and presence of diabetes, 2015

Table 95 Patient distribution, by age and presence of diabetes, 2015

Age	With diabetes	Without diabetes	Subtotal	Unspecified	No information available	Total
< 15	3	68	71	32		103
15 ≤, < 30	70	687	757	213		970
30 ≤, < 45	4736	6964	11,700	2155	1	13,856
45 ≤, < 60	25,919	23,059	48,978	7363		56,341
60 ≤, < 75	69,955	53,880	123,835	17,796	3	141,634
75 ≤, < 90	42,473	38,958	81,431	13,314	3	94,748
90 ≤	1711	2850	4561	999		5560
Subtotal	144,867	126,466	271,333	41,872	7	313,212
No information available	3	1	4	1		5
Total	144,870	126,467	271,337	41,873	7	313,217
Mean	68.01	67.62	67.83	68.03	69.71	67.86
S.D.	11.42	13.37	12.37	13.26	15.09	12.49

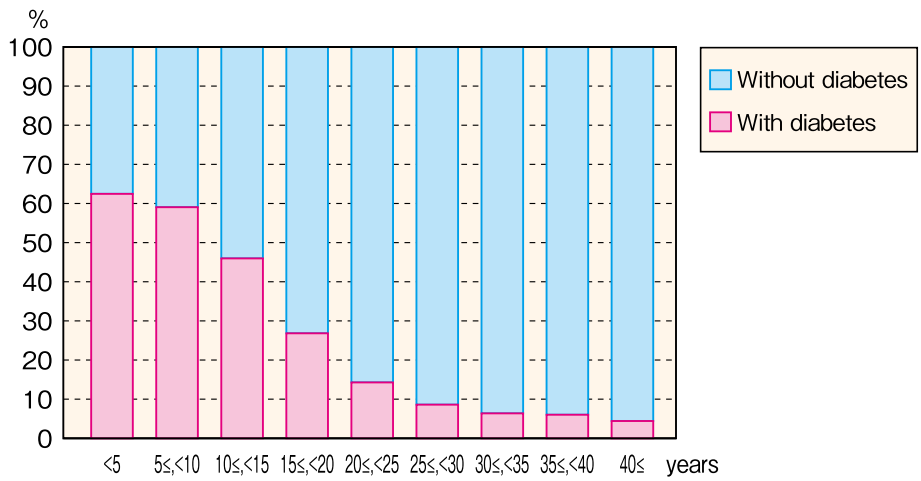

Fig. 91 Prevalent dialysis patient distribution, by dialysis vintage and presence of diabetes, 2015

Table 96 Prevalent dialysis patient distribution, by dialysis vintage and presence of diabetes, 2015

Dialysis vintage	With diabetes	Without diabetes	Subtotal	Unspecified	No information available	Total
< 5	81,726	49,115	130,841	17,169	7	148,017
5 ≤, < 10	40,416	28,026	68,442	9359	0	77,801
10 ≤, < 15	15,681	18,433	34,114	5946	0	40,060
15 ≤, < 20	4741	12,929	17,670	3885	0	21,555
20 ≤, < 25	1371	8232	9603	2428	0	12,031
25 ≤, < 30	451	4794	5245	1485	0	6730
30 ≤, < 35	196	2880	3076	841	0	3917
35 ≤, < 40	98	1530	1628	468	0	2096
40 ≤	22	476	498	119	0	617
Subtotal	144,702	126,415	271,117	41,700	7	312,824
Unspecified	168	51	219	173		392
No information available		1	1			1
Total	144,870	126,467	271,337	41,873	7	313,217
Mean	5.03	9.40	7.07	8.90	1.29	7.31
S.D.	4.84	8.87	7.34	8.63	1.11	7.55

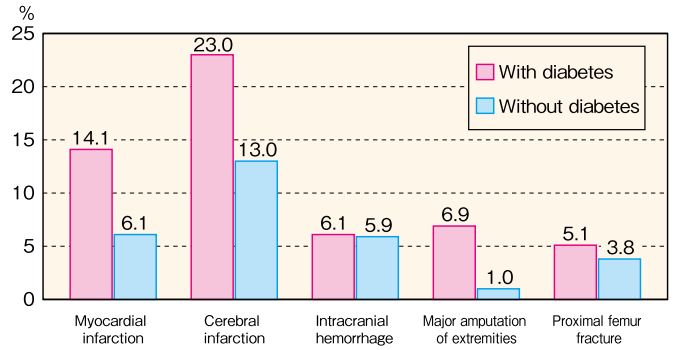

Fig. 92 Prevalent dialysis patient distribution, by major past history and presence of diabetes, 2015

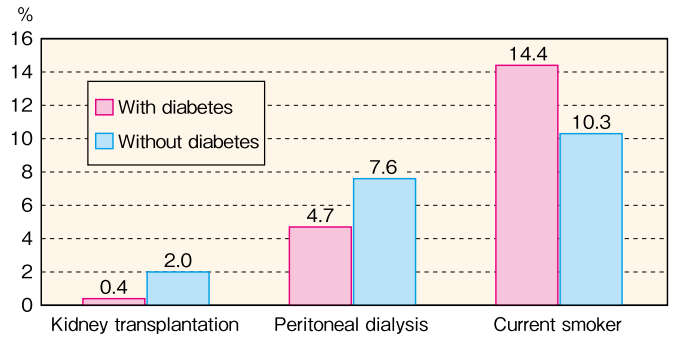

Fig. 93 Prevalent dialysis patient distribution, by history of kidney transplantation and peritoneal dialysis, smoking status and presence of diabetes, 2015

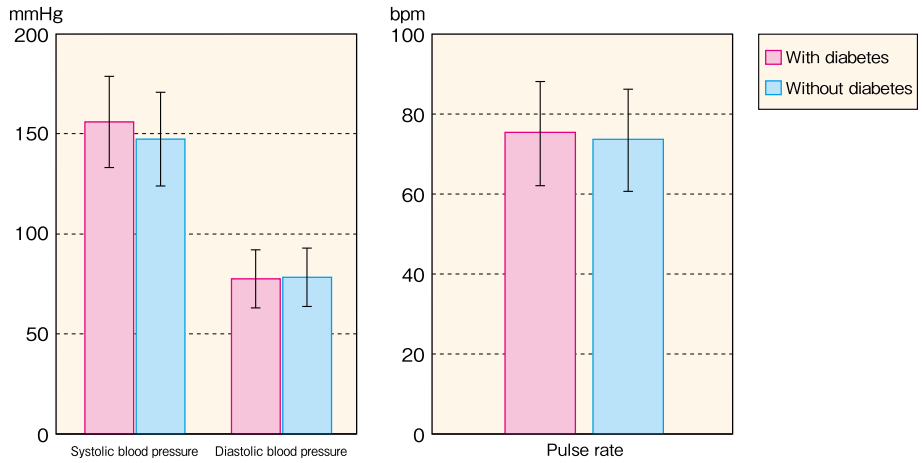

Fig. 94 Blood pressure and pulse rate, by presence of diabetes, 2015

Table 97 Blood pressure and pulse rate, by presence of diabetes, 2015

		With diabetes	Without diabetes
Systolic blood pressure	Mean	156.05	147.46
	S.D.	24.8	23.42
Diastolic blood pressure	Mean	77.58	78.37
	S.D.	14.52	14.59
Pulse rate	Mean	75.42	73.68
	S.D.	12.85	12.6

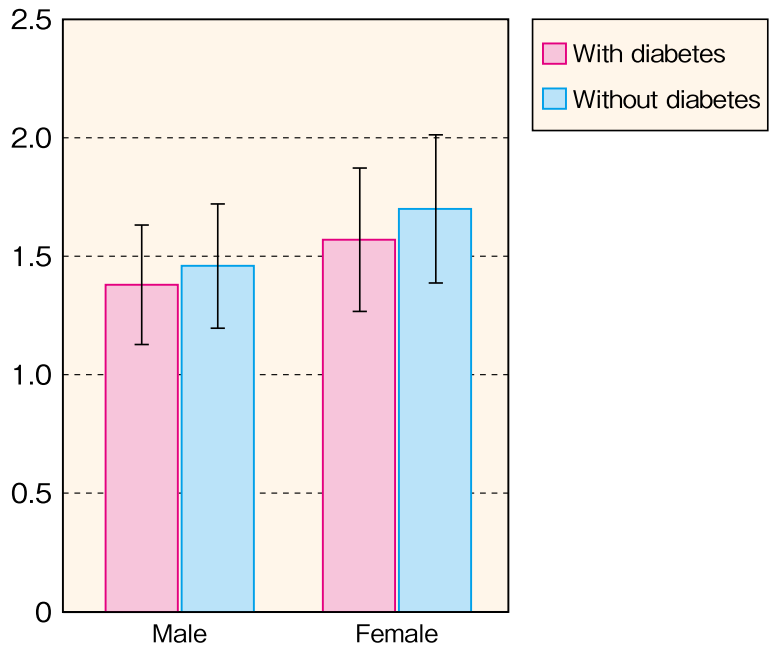

Fig. 95 *Kt/V*sp, by sex and presence of diabetes, 2015

Table 98 *Kt/V*sp, by presence of diabetes and sex, 2015

		With diabetes	Without diabetes
Male	Mean	1.38	1.46
	S.D.	0.25	0.26
Female	Mean	1.57	1.70
	S.D.	0.30	0.31

*Kt/V*sp was summarized in the patients with vintages of 2 years or more and receiving dialysis three times a week

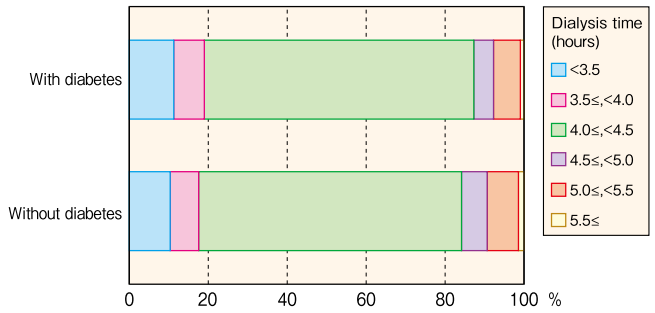

Fig. 96 Prevalent dialysis patient distribution, by presence of diabetes and dialysis time, 2015

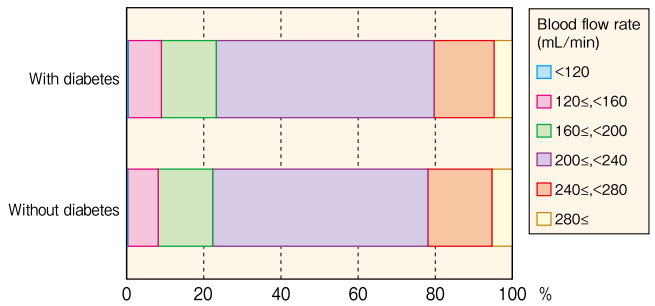

Fig. 97 Prevalent dialysis patient distribution, by presence of diabetes and blood flow rate, 2015

Table 99 Prevalent dialysis patient distribution, by presence of diabetes and dialysis time, 2015

Dialysis time (hour)	With diabetes	Without diabetes	Subtotal	Unspecified	No information available	Total
< 3.5	14,900	12,661	27,561	3088	1	30,650
3.52 ≤, < 4.0	10,242	8826	19,068	2085		21,153
4.0 ≤, < 4.5	90,319	81,423	171,742	19,627		191,369
4.5 ≤, < 5.0	6606	7938	14,544	1571		16,115
5.0 ≤, < 5.5	8999	9693	18,692	1898		20,590
5.5 ≤	1215	1720	2935	254		3189
Subtotal	132,281	122,261	254,542	28,523	1	283,066
No information available	12,589	4206	16,795	13,350	6	30,151
Total	144,870	126,467	271,337	41,873	7	313,217
Mean	3.97	4.01	3.99	3.99	3.00	3.99
S.D.	0.52	0.56	0.54	0.52	0.00	0.54

Table 100 Prevalent dialysis patient distribution, by presence of diabetes and blood flow rate, 2015

Blood flow rate	With diabetes	Without diabetes	Subtotal	Unspecified	No information available	Total
< 120	513	346	859	138		997
120 ≤, < 160	11,303	9620	20,923	2187		23,110
160 ≤, < 200	18,601	17,201	35,802	3849		39,651
200 ≤, < 240	73,929	67,909	141,838	15,139		156,977
240 ≤, < 280	20,384	20,233	40,617	4585		45,202
280 ≤	6204	6442	12,646	1434		14,080
Subtotal	130,934	121,751	252,685	27,332		280,017
No information available	13,936	4716	18,652	14,541	7	33,200
Total	144,870	126,467	271,337	41,873	7	313,217
Mean	207.97	209.85	208.87	209.90	0.00	208.97
S.D.	37.59	38.37	37.98	38.94	0.00	38.07

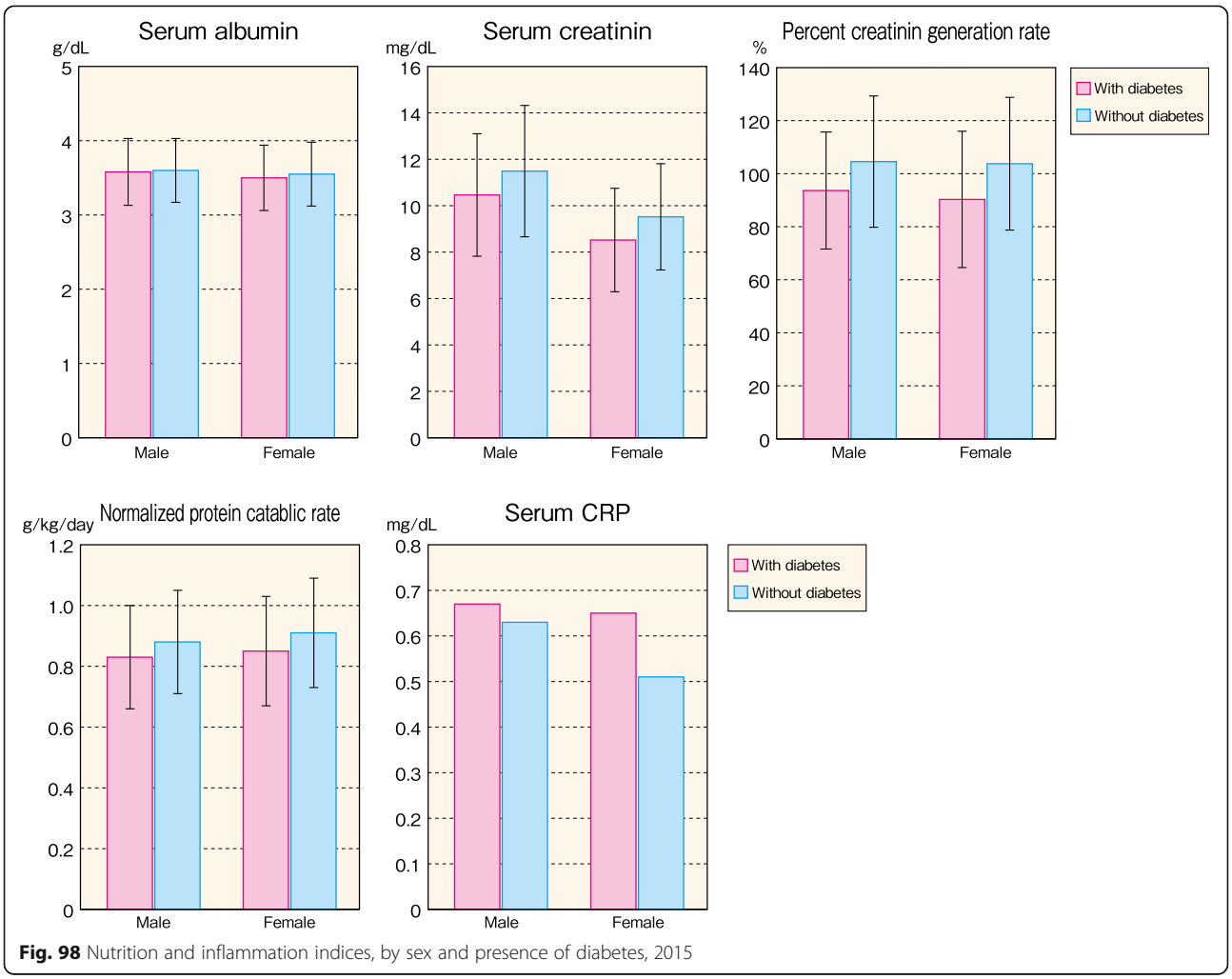

Fig. 98 Nutrition and inflammation indices, by sex and presence of diabetes, 2015

Table 101 Nutrition and inflammation indices, by sex and presence of diabetes, 2015

Serum albumin (g/dL)			
		With diabetes	Without diabetes
Male	Mean	3.58	3.60
	S.D.	0.45	0.43
Female	Mean	3.50	3.55
	S.D.	0.44	0.43
Pre-dialysis serum creatinine (mg/dL)[a]			
		With diabetes	Without diabetes
Male	Mean	10.46	11.49
	S.D.	2.64	2.83
Female	Mean	8.52	9.52
	S.D.	2.23	2.29
Percent creatinine generation rate(%)[a]			
		With diabetes	Without diabetes
Male	Mean	93.64	104.54
	S.D.	24.91	24.75
Female	Mean	90.29	103.75
	S.D.	25.70	25.03
Normalized protein catabolic rate(g/kg/day)[a]			
		With diabetes	Without diabetes
Male	Mean	0.83	0.88
	S.D.	0.17	0.17
Female	Mean	0.85	0.91
	S.D.	0.18	0.18
Serum CRP level (mg/dL)			
		With diabetes	Without diabetes
Male	Mean	0.67	0.63
	S.D.	1.92	1.78
Female	Mean	0.65	0.51
	S.D.	1.94	1.59

[a]Creatinine concentration, %CGR, and nPCR were summarized in the patients with vintages of 2 years or more and receiving dialysis three times a week

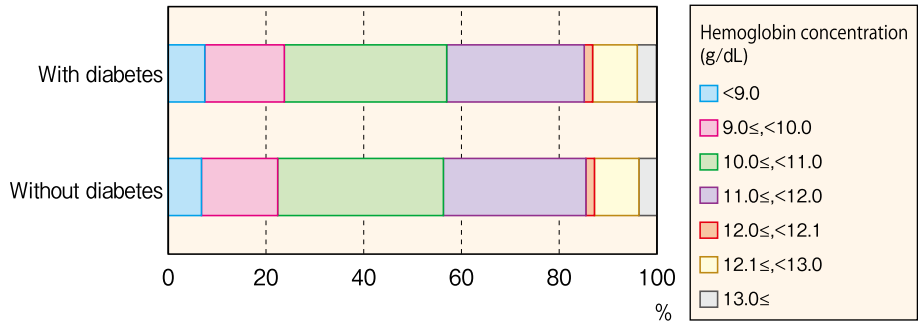

Fig. 99 Prevalent dialysis patient distribution, by presence of diabetes and hemoglobin concentration, 2015

Table 102 Prevalent dialysis patient distribution, by presence of diabetes and hemoglobin concentration, 2015

Hemoglobin concentration	With diabetes	Without diabetes	Subtotal	Unspecified	No information available	Total
< 9.0	9802	8286	18,088	1873		19,961
9.0 ≤, < 10.0	21,256	19,273	40,529	4142		44,671
10.0 ≤, < 11.0	43,785	41,448	85,233	9010		94,243
11.0 ≤, < 12.0	36,953	36,123	73,076	7902		80,978
12.0 ≤, < 12.1	2372	2288	4660	550		5210
12.1 ≤, < 13.0	12,036	11,116	23,152	2443	1	25,596
13.0 ≤	5226	4545	9771	1083	1	10,855
Subtotal	131,430	123,079	254,509	27,003	2	281,514
No information available	13,440	3388	16,828	14,870	5	31,703
Total	144,870	126,467	271,337	41,873	7	313,217
Mean	10.74	10.77	10.75	10.76	12.85	10.75
S.D.	1.30	1.25	1.28	1.31	0.78	1.28

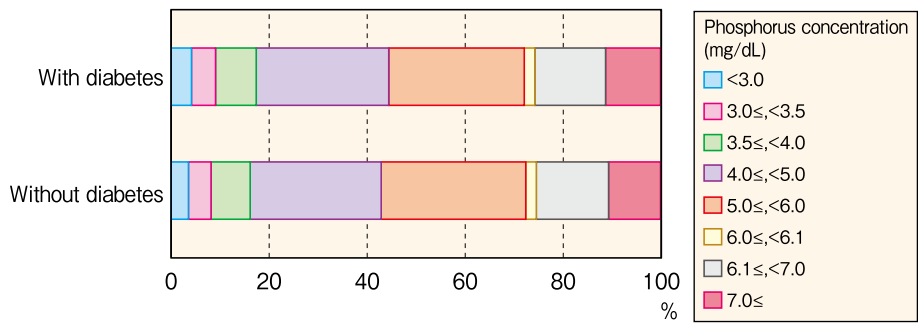

Fig. 100 Prevalent dialysis patient distribution, by presence of diabetes and phosphorus concentration, 2015

Table 103 Prevalent dialysis patient distribution, by presence of diabetes and phosphorus concentration, 2015

Phosphorus concentration	With diabetes	Without diabetes	Subtotal	Unspecified	No information available	Total
< 3.0	5457	4477	9934	1026		10,960
3.0 ≤, < 3.5	6420	5702	12,122	1235		13,357
3.5 ≤, < 4.0	11,150	9794	20,944	2157		23,101
4.0 ≤, < 5.0	35,652	33,130	68,782	7446		76,228
5.0 ≤, < 6.0	36,565	36,304	72,869	7940	1	80,810
6.0 ≤, < 6.1	2950	2864	5814	615		6429
6.1 ≤, < 7.0	19,161	18,071	37,232	4030	1	41,263
7.0 ≤	14,657	13,251	27,908	3063		30,971
Subtotal	132,012	123,593	255,605	27,512	2	283,119
No information available	12,858	2874	15,732	14,361	5	30,098
Total	144,870	126,467	271,337	41,873	7	313,217
Mean	5.24	5.26	5.25	5.28	5.90	5.25
S.D.	1.46	1.42	1.44	1.45	0.99	1.44

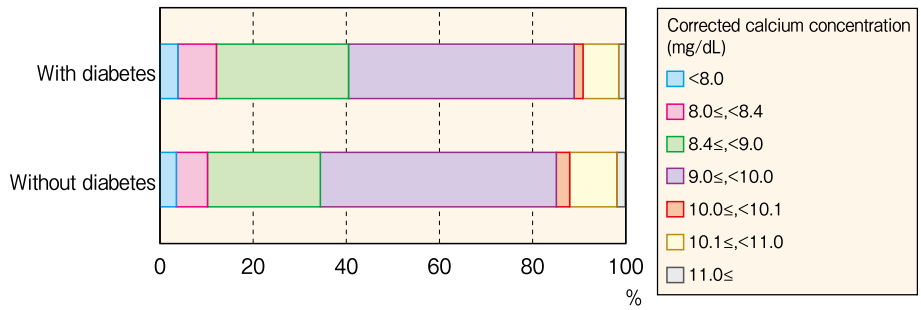

Fig. 101 Prevalent dialysis patient distribution, by presence of diabetes and corrected calcium concentration, 2015

Table 104 Prevalent dialysis patient distribution, by presence of diabetes and corrected calcium concentration, 2015

Corrected calcium concentration	With diabetes	Without diabetes	Subtotal	Unspecified	No information available	Total
< 8.0	4905	4079	8984	822	1	9807
8.0 ≤, < 8.4	9625	7406	17,031	1742		18,773
8.4 ≤, < 9.0	38,384	30,749	69,133	6908		76,041
9.0 ≤, < 10.0	63,194	61,694	124,888	13,669	1	138,558
10 ≤, < 10.1	2743	3395	6138	689		6827
10.1 ≤, < 11.0	10,086	12,521	22,607	2723		25,330
11.0 ≤	1736	2261	3997	518		4515
Subtotal	130,673	122,105	252,778	27,071	2	279,851
No information available	14,197	4362	18,559	14,802	5	33,366
Total	144,870	126,467	271,337	41,873	7	313,217
Mean	9.13	9.23	9.18	9.23	8.45	9.18
S.D.	0.73	0.76	0.75	0.75	0.78	0.75

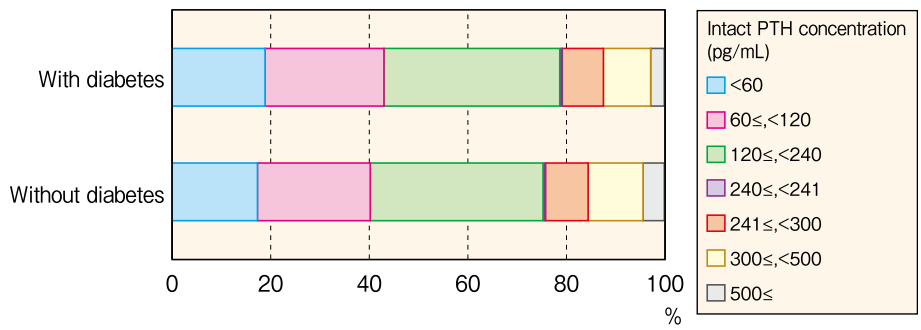

Fig. 102 Prevalent dialysis patient distribution, by presence of diabetes and intact PTH concentration, 2015

Table 105 Prevalent dialysis patient distribution, by presence of diabetes and intact PTH concentration, 2015

Intact PTH concentration	With diabetes	Without diabetes	Subtotal	Unspecified	No information available	Total
< 60	21,129	18,568	39,697	3981	2	43,680
60 ≤, < 120	27,332	24,645	51,977	5209		57,186
120 ≤, < 240	40,815	37,850	78,665	8307		86,972
240 ≤, < 241	211	201	412	42		454
241 ≤, < 300	9665	9551	19,216	2054		21,270
300 ≤, < 500	10,687	11,774	22,461	2493		24,954
500 ≤	3213	4865	8078	1011		9089
Subtotal	113,052	107,454	220,506	23,097	2	243,605
No information available	31,818	19,013	50,831	18,776	5	69,612
Total	144,870	126,467	271,337	41,873	7	313,217
Mean	168.86	188.62	178.49	186.86	10.00	179.28
S.D.	147.42	191.34	170.53	183.28	1.41	171.80

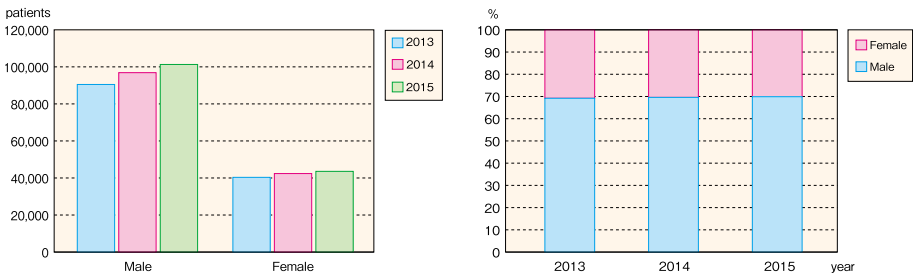

Fig. 103 Diabetic dialysis patient distribution, by sex, 2013–2015

Table 106 Diabetic dialysis patient distribution, by sex, 2013–2015

Sex	2013		2014		2015	
Male	90,492	(69.2)	96,863	(69.6)	101,294	(69.9)
Female	40,344	(30.8)	42,390	(30.4)	43,576	(30.1)
Subtotal	130,836	(100.0)	139,253	(100.0)	144,870	(100.0)
No information available	0		0		0	
Total	130,836		139,253		144,870	

Values in parentheses under each figure represent the percentage relative to the total in each column

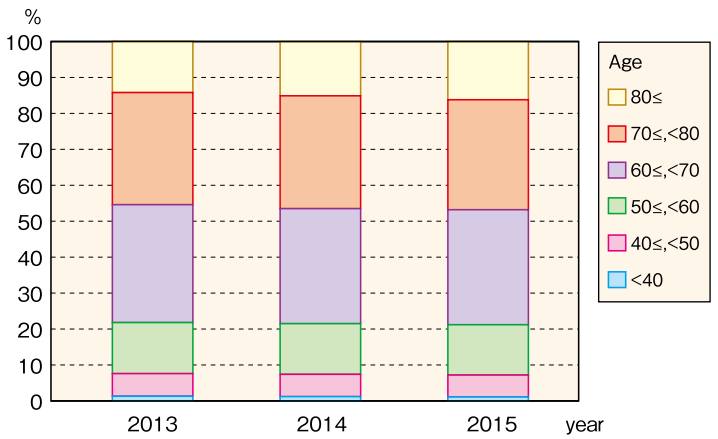

Fig. 104 Diabetic dialysis patient distribution, by age, 2013–2015

Table 107 Diabetic dialysis patient distribution, by age, 2013–2015

Age	2013		2014		2015	
< 40	1662	(1.3)	1633	(1.2)	1606	(1.1)
40 ≤, < 50	8193	(6.3)	8672	(6.2)	8875	(6.1)
50 ≤, < 60	18,633	(14.2)	19,585	(14.1)	20,247	(14.0)
60 ≤, < 70	42,870	(32.8)	44,621	(32.0)	46,379	(32.0)
70 ≤, < 80	40,778	(31.2)	43,685	(31.4)	44,347	(30.6)
80 ≤	18,698	(14.3)	21,051	(15.1)	23,413	(16.2)
Subtotal	130,834	(100.0)	139,247	(100.0)	144,867	(100.0)
Unspecified/no information available	2		6		3	
Total	130,836		139,253		144,870	
Mean	67.48		67.75		68.01	
S.D.	11.31		11.36		11.42	

Values in parentheses under each figure represent the percentage relative to the total in each column

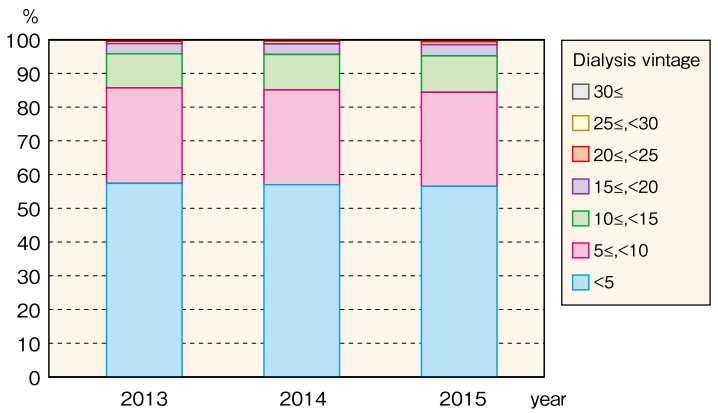

Fig. 105 Diabetic dialysis patient distribution, by dialysis vintage, 2013–2015

Table 108 Diabetic dialysis patient distribution, by dialysis vintage, 2013–2015

Dialysis vintage	2013		2014		2015	
< 5	75,087	(57.4)	79,337	(57.0)	81,726	(56.5)
5 ≤, < 10	37,047	(28.3)	39,189	(28.1)	40,416	(27.9)
10 ≤, < 15	13,209	(10.1)	14,557	(10.5)	15,681	(10.8)
15 ≤, < 20	3869	(3.0)	4293	(3.1)	4741	(3.3)
20 ≤, < 25	977	(0.7)	1199	(0.9)	1371	(0.9)
25 ≤, < 30	366	(0.3)	391	(0.3)	451	(0.3)
30 ≤	241	(0.2)	256	(0.2)	316	(0.2)
Subtotal	130,796	(100.0)	139,222	(100.0)	144,702	(100.0)
Unspecified/no information available	40		31		168	
Total	130,836		139,253		144,870	
Mean	4.87		4.92		5.03	
S.D.	4.65		4.73		4.84	

Values in parentheses under each figure represent the percentage relative to the total in each column

Additional file

Additional file 1: Table S1. Cumulative survival rates by incident year, 1983–2014. (XLSX 20 kb)

Abbreviations

AFBF: Acetate-free biofiltration; APD: Automated peritoneal dialysis; CRP: C-reactive protein; D/P Cr ratio: Dialysate/plasma creatinine ratio; EPS: Encapsulating peritoneal sclerosis; ESI: Exit-site infection; ETRF: Endotoxin retentive filter; HD: Hemodialysis; HDF: Hemodiafiltration; HDL-C: High-density lipoprotein cholesterol concentration; HHD: Home hemodialysis; JRDR: JSDT Renal Data Registry; JSDT: Japanese Society for Dialysis Therapy; *Kt/V*: Index for standardized dialysis dose defined as follows: *K* is the urea clearance, *t* is the dialysis time, *V* is the body fluid volume; PD: Peritoneal dialysis; PET: Peritoneal equilibration test; PIH: Pregnancy-induced hypertension; PKD: Polycystic kidney disease; pmp: Per million of the population; PTH: Parathyroid hormone; RPGN: Rapidly progressive glomerulonephritis; TVC: Total viable microbial count; UMIN: University hospital Medical Information Network; UMIN-CTR: the UMIN Clinical Trials Registry; UN: urea N; USB: Universal serial bus

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Availability of data and materials

- When anyone wants to use the data and materials from the current manuscript without modifications, all data and materials are freely available, stating "the data are from the annual dialysis data report 2015 of JSDT renal data tregistry".
- When anyone wants to use the data and materials from the current manuscript with modifications, any re-calculations or something, they have to state the following sentence in their publication. "The data reported here have been provided by the annual dialysis data report 2015 of JSDT renal data tregistry. The interpretation and reporting of these data are the responsibility of the authors and in no way should be seen as an official policy or interpretation of the JSDT."

Authors' contributions

IM was the director of CRDR in 2015 and directed all of the 2015 JRDR survey. IM and MT finalized the results of the survey and made this manuscript. SO and AW designed the survey sheets and made a special program mounted in MS Excel worksheet for the convenience of self-assessment for the dialysis quality of each dialysis facility. SN, NK, KT, SG, and TH had the responsibilities on the data analysis. JM had the responsibility on the ethical aspect of the JRDR survey. KN was the president of JSDT in 2015, and checked all the results from the 2015 JRDR survey and approved them to be published. All authors read and approved the final manuscript.

Ethics approval and consent to participate

1. The JSDT registry was approved by the ethical committee of JSDT; the approval no. is 1.
2. The aims of JSDT Renal Data Registry (JRDR) were well explained for the participated dialysis patients through the dialysis facilities.
3. It does not always need to get the documented approval form from the patients because all the collected data were the existing ones and there were no new interventions.
4. The original data had been totally anonymized, so there are no risks for deteriorating the privacy of the dialysis facilities and the patients.
5. The data presented in the current manuscript does not contain any images, videos, voice recording which might have a risk for identifying an individual.

Consent for publication
Not applicable

Competing interests
The authors declare that they have no competing interests.

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