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Overview of Regular Dialysis Treatment in Japan (as of 31 December 2011)

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Abstract: A nationwide statistical survey of 4255 dialysis facilities was conducted at the end of 2011. Responses were submitted by 4213 facilities (99.0%). The number of new patients started on dialysis was 38 613 in 2011. Although the number of new patients decreased in 2009 and 2010, it increased in 2011. The number of patients who died each year has been increasing; it was 30 743 in 2011, which exceeded 30 000 for the first time. The number of patients undergoing dialysis has also been increasing every year; it was 304 856 at the end of 2011, which exceeded 300 000 for the first time. The number of dialysis patients per million at the end of 2011 was 2385.4. The crude death rate of dialysis patients in 2011 was 10.2%, which exceeded 10% for the first time in the last 20 years. The mean age of new dialysis patients was 67.84 years and the mean age of the entire dialysis patient population was 66.55 years. The most common primary cause of renal failure among new dialysis patients was diabetic nephropathy (44.3%). Diabetic nephropathy was also the most common primary disease among the entire dialysis patient population (36.7%), exceeding chronic glomerulonephritis (34.8%) which had been the highest until last year. The survey included questions related to the Great East Japan Earthquake, which occurred on 11 March 2011. The results on items associated with the Great East Japan Earthquake were reported separately from this report. The mean uric acid levels of the male and female patients were 7.30 and 7.19 mg/dL, respectively. Certain drugs for hyperuricemia were prescribed for approximately 17% of patients. From the results of the facility survey, the number of patients who underwent peritoneal dialysis (PD) was 9642 and the number of patients who did not undergo PD despite having a peritoneal dialysis catheter was 369. A basic summary of the results on the survey items associated with PD is included in this report and the details were reported separately. **Key Words:** Combined use, Dialysis patient population, Peritoneal dialysis, Survival rate, Uric acid.

The Japanese Society for Dialysis Therapy (JSDT) has been conducting a statistical survey of dialysis facilities across the country annually since 1968. Initially, only the numbers of dialysis patients and beds for dialysis were annually surveyed for dialysis facilities. Later, survey items related to all dialysis patients treated in facilities that participated in the surveys were added and the obtained data have been registered in an electronic database since 1983 (1).

In the 2011 survey, the following items were included in addition to the basic survey items.

First, items associated with the Great East Japan Earthquake that occurred in March 2011 were added as requested by the Japanese Association of Dialysis Physicians.

Second, serum uric acid level was newly added to obtain data on hyperuricemia in dialysis patients because such information has been limited. The items

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associated with lipids were also included and the data obtained were used as reference for analyzing the relationship between hyperuricemia and arteriosclerosis.

Third, the quality of dialysate has been surveyed continuously since 2006. From 2010, facilities that maintain the required quality of dialysate can obtain additional points in the medical insurance system in Japan. From 2012, facilities that offer online hemodiafiltration (HDF) can also obtain additional points. The findings in the previous surveys may have contributed to the approval of this revised point system by the medical insurance administration of the government.

Fourth, the current status of patients who underwent peritoneal dialysis (PD) has been surveyed continuously since 2009 in cooperation with the Japanese Society for Peritoneal Dialysis. In the facility survey, the number of patients who underwent PD and another blood purification therapy (PD + another therapy patients) was determined. In the patient survey, PD dose, remaining renal function, and peritoneal function were examined in detail. The obtained survey results are expected to be used as the basis for preparing new guidelines for PD.

In this report, data obtained from the 2011 survey were summarized with regard to the following items:

A Basic demographics
B Items associated with uric acid
C Items associated with lipids
D Current status of dialysate quality control
E Items associated with PD

The results on items associated with the Great East Japan Earthquake were reported separately from this report. A basic summary of the results on the survey items associated with PD is included in this report and the details were reported separately.

All the figures and tables included in a CD-ROM that contains detailed data from each annual survey ("Overview of Regular Dialysis Treatment in Japan, the CD-ROM Report", hereafter referred to as the CD-ROM) have been available since 2012 on the members-only pages of the JSDT website in order to widely distribute the survey findings among JSDT members. These pages contain all the findings since the first survey conducted in 1968 to the latest survey. Any JSDT member can access these pages. The pages have a simple search function. Please refer to a review report for the survey items included in the previous surveys and the historical background (1).

The quick summaries of survey results in "The Illustrated, Overview of Regular Dialysis Treatment in Japan" (hereafter, the Report) are available to not only JSDT members but also the general public on the JSDT homepage (http://www.jsdt.or.jp/).

PATIENTS AND METHODS

Method of survey

This survey is conducted annually by sending questionnaires to target dialysis facilities. A total of 4255 facilities surveyed were either member facilities of JSDT, non-member facilities offering regular hemodialysis (HD), or non-member facilities offering PD but not HD as of 31 December 2011. The number of facilities participating in this survey increased by 29 (0.7%) from the previous year (4226 facilities) (2).

The questionnaires were mainly sent and collected by postal mail; some were also faxed. Universal serial bus (USB) memory devices that stored electronic spreadsheets in Microsoft Excel were also sent with the questionnaires to the facilities, which were requested to use the devices for the completion of the questionnaires as much as possible.

In this survey, two sets of questionnaires were used. One was for the facility survey, which included items related to dialysis facilities such as the number of patients, the number of staff members, and the number of dialyzers used at individual facilities (the questionnaire used is referred to as "Sheet I"). The other was the patient survey, which included items on the epidemiological background, treatment conditions, and outcome of treatment of individual dialysis patients (the questionnaires used are referred to as "Sheets II, III, and IV").

The deadline for acceptance of responses was the end of January 2012. The acceptance of additional responses received after this deadline ended on 23 April 2012 for the preparation of the Report and on 18 September 2012 for the preparation of the CD-ROM Report (3).

For the CD-ROM Report, the number of facilities that responded to the facility survey (Sheet I) was 4213 (99.0%), and the number of facilities that responded to both the facility and patient surveys (Sheets I–IV) was 4107 (96.5%). Moreover, the number of facilities that completed the questionnaires using the electronic medium was 3594 (84.5%), which was higher than that in the 2010 survey (3545 facilities, 83.9%). This increase contributed to the accurate and simplified analysis of survey data. This annual report is based on the data tabulated for the CD-ROM Report (3).

In the 2011 survey, damage to nationwide dialysis facilities by the Great East Japan Earthquake that occurred on 11 March 2011 was also surveyed, as well

as the preventive measures against damage and the transfer of dialysis patients after the earthquake. The survey items in these categories were determined jointly by JSDT, the Japanese Association of Dialysis Physicians, the Japanese Society of Nephrology, and the Japan Association for Clinical Engineers. The facilities that did not offer dialysis at the end of 2011 because of damage by the earthquake (including the tsunami, facility collapse, nuclear power plant accidents) were excluded. As explained in the Introduction, the results on items associated with the Great East Japan Earthquake were reported separately from this report.

Survey items

The 2011 survey includes the following survey items.

Facility survey

The following items were also included in the 2010 survey (2).

- Name and address of facility
- Year and month when the facility started dialysis treatment
- Total number of patients who can simultaneously receive dialysis
- Maximum capacity
- Number of bedside consoles
- Number of workers engaged in dialysis treatment (e.g. doctors, nurses, clinical engineers, nutritionists, case workers)
- Number of patients who underwent dialysis at the end of 2011 (daytime dialysis, nighttime dialysis, home HD, PD)
- Number of patients who did not undergo PD despite having a peritoneal catheter for PD (including those who underwent only peritoneal lavage) among those who underwent daytime dialysis, nighttime dialysis, or home HD (hereafter, denoted as non-PD + catheter patients)
- Number of patients who underwent both PD and another blood purification method by extracorporeal circulation such as HD and HDF (hereafter, denoted as PD + HD patients)
- Number of patients who underwent dialysis in 2011 and were hospitalized
- Number of new patients who were started on dialysis in 2011
- Number of new patients who were started on PD in 2011 but introduced to other blood purification methods in 2011 (hereafter, denoted as PD dropout patients)
- Number of dialysis patients who died in 2011
- Number of bedside consoles equipped with an endotoxin retentive filter (ETRF)
- Use or non-use of ETRFs for collecting dialysate
- Site from which dialysate was sampled for dialysate test
- Frequency of measurement of endotoxin concentration in dialysate
- Endotoxin concentration in dialysate
- Frequency of measurement of bacterial count in dialysate
- Volume of sample for measurement of bacterial count in dialysate
- Medium used for cultivation of bacteria in dialysate
- Bacterial count in dialysate

Patient survey

The following are the basic survey items that have been continuously collected since 1983.

- Pseudonym of patients
- Gender
- Date of birth
- Year and month of start of dialysis
- Year and month of transfer to another hospital
- Primary disease
- Prefecture where the patient lives
- Treatment method
- Month of transfer (Code of facility to which the patient is transferred)
- Month and cause of death
- Year and month of change in dialysis method and change in code

The following items were collected in addition to the basic survey items using both paper and electronic media. New survey items are noted with an asterisk. The history of encapsulating peritoneal sclerosis (EPS) was surveyed only for the facilities that responded to the questionnaires using the electronic medium at the end of 2010 but for all the target facilities at the end of 2011.

- Current status of combined use of PD and another method such as HD and HDF (hereafter, denoted as current status of combined use of PD and another method)
- Number of years on ongoing PD (period on PD)
- History of undergoing PD*
- Frequency of dialysis (e.g. HD) per week
- Duration of one session of dialysis (e.g. HD) (dialysis duration)
- Height
- Predialysis and postdialysis weights
- Predialysis and postdialysis blood urea nitrogen (BUN) levels

- Predialysis and postdialysis serum creatinine levels
- Predialysis serum calcium level
- Predialysis serum phosphorus level
- Predialysis serum albumin level
- Predialysis serum C-reactive protein (CRP) level
- Predialysis blood hemoglobin level
- Measurement method for serum parathyroid hormone (PTH) level
- Serum PTH level
- Predialysis serum uric acid level*
- Current status of use of antihyperuricemic drugs*
- History of gouty attacks*
- Use or nonuse of antihyperlipidemic drugs*
- Serum total cholesterol level
- Serum high-density lipoprotein (HDL) cholesterol level
- History of hypertension*
- Smoking habit
- History of diabetes*
- History of undergoing carpal tunnel release surgery (CTx)
- History of myocardial infarction
- History of cerebral hemorrhage
- History of cerebral infarction
- History of quadruple amputation
- History of femoral neck fracture
- History of EPS (for all the target facilities for the first time)

The following are the items collected through the electronic medium in addition to the basic survey items in the facility survey. All these survey items target PD patients only. New survey items are asterisked.

- Performance or non-performance of peritoneal equilibrium test (PET)*
- Four-hour creatinine dialysate/plasma ratio in PET (PET Cr D/P ratio)
- Type of dialysate used for PD (Type of PD solution)
- Volume of PD solution used per day (Volume of PD solution)
- Daily urine output (Urine output)
- Mean amount of water removed per day (Amount of water removal)*
- Kt/V for residual kidney (residual-kidney Kt/V)
- Kt/V for PD (PD Kt/V)
- Number of times peritonitis occurred per year (Frequency of peritonitis)

Calculation of survival rate

The cumulative survival rate after the initiation of dialysis was actuarially calculated (4).

RESULTS AND DISCUSSION

Basic demographics

Number of patients

Table 1 shows a summary of the dynamics of the dialysis patient population in Japan at the end of 2011 obtained in this survey. As mentioned above, the number of facilities that responded to the questionnaire (the facility survey) in the 2011 survey was 4213. Data on the number of years on dialysis (period on dialysis) and the longest period on dialysis were obtained from the patient survey. All the other results were obtained from the facility survey.

As determined from the facility survey, the total number of dialysis patients in Japan at the end of 2011 was 304 856, which exceeded 300 000 for the first time (Table 1). Table 2 shows changes in the number of dialysis patients for the last 20 years. The annual increase in the dialysis patient population for the last several years was 6000–8000. Around 2001, however, the dialysis patient population annually increased by approximately 10 000–12 000. The rate of increase has slowed in recent years. The annual rate of growth of the dialysis patient population, defined as the ratio of the increase in the dialysis patient population each year to the dialysis patient population at the end of the previous year, has been decreasing linearly every year. If this trend continues, the dialysis patient population in Japan is expected to start decreasing in around 2021 (5).

The number of new patients who were started on dialysis (the annual number of new dialysis patients) was 38 613 in 2011. The annual number of new dialysis patients continued to decrease from 2008 to 2010 but increased in 2011 (Table 2).

Here, changes in the growth rate of the new dialysis patients were estimated using a similar method adopted for estimating the growth in the dialysis patient population (Fig. 1) (5). As mentioned above, the growth rate of the number of new dialysis patients reversed its downward trend and increased significantly in 2011. However, such a fluctuation in the growth rate of the annual number of new dialysis patients was repeatedly observed in the past. The figure reveals that the growth rate of the annual number of new dialysis patients generally tends to decrease each year over the past 20 years despite the increase in the 2011 survey. It appears that the regression line will fall below zero, resulting in negative growth by approximately 2012.

The total number of dialysis patients who died (the annual number of deaths) in 2011 was 30 743, which exceeded 30 000 for the first time (Table 1). Unfortunately, the annual number of deaths has continued to

TABLE 1. *Current status of regular dialysis treatment in Japan (as of 31 December 2011)*

Number of facilities		4213 facilities	(increase of 47 facilities, 1.1% increase)
Equipment	Number of bedside consoles	121 863 units	(increase of 3241 units, 2.7% increase)
Capacity	Total number of patients who can simultaneously receive dialysis	119 927 patients	(increase of 3108 patients, 2.7% increase)
	Maximum capacity	405 581 patients	(increase of 9857 patients, 2.5% increase)
Total number of patients regularly undergoing dialysis		304 856 patients	(increase of 6604 patients)
Number of patients per million		2385.4 patients	(increase of 56.3 patients)
Number of patients for different dialysis methods	Daytime	253 916 patients	(83.3%)
	Nighttime	40 971 patients	(13.4%)
	Home HD	327 patients	(0.1%)
	PD	9642 patients	(3.2%)
Number of PD + HD patients[†]		1902 patients	
Number of non-PD + catheter patients[‡]		369 patients	
Number of PD dropout patients[§]		175 patients	
Annual number of new dialysis patients		38 613 patients	(increase of 1 101 patients, 2.9% increase)
Annual number of deceased patients		30 743 patients	(increase of 1 861 patients, 6.4% increase)

*The above data were obtained from the facility survey.

Period on dialysis (years)	Male	Female	Unspecified	Total	(%)
0 ≤ < 5	92 826	48 249	1	141 076	(47.7)
5 ≤ < 10	46 960	28 113	0	75 073	(25.4)
10 ≤ < 15	22 193	15 395	0	37 588	(12.7)
15 ≤ < 20	11 085	8 449	0	19 534	(6.6)
20 ≤ < 25	5 679	4 950	0	10 629	(3.6)
25 ≤ <	6 416	5 419	0	11 835	(4.0)
Total	185 159	110 575	1	295 735	(100.0)
Longest period on dialysis		43 years and 9 months			

*The above data were obtained from the patient survey.

[†]Number of PD + HD patients: Number of patients who underwent both PD and HD, HDF, hemoadsorption, or hemofiltration (excluding those who underwent only peritoneal lavage). [‡]Number of non-PD + catheter patients: Number of patients who did not undergo PD despite having a peritoneal catheter but underwent HD, HDF, hemoadsorption, or hemofiltration (including those who underwent only peritoneal lavage). [§]Number of PD dropout patients: Number of new patients who were started on PD in 2011 but introduced to another dialysis method within 2011.

increase since the first survey (Table 2). Changes in the growth rate of the annual number of deaths were also graphed (Fig. 2). Although the growth rate of the annual number of deaths tended to decrease until 2000, it has remained almost unchanged since 2001. The figure also shows the regression line for the annual growth rate between 2001 and 2011 (• in Fig. 2). The slope of the regression line is almost zero, and the growth rate of the annual number of deaths is not expected to become zero. This means that the annual number of deaths will continue to increase. If the annual number of new dialysis patients starts to decrease while the annual number of deaths continues to increase, the dialysis patient population in Japan is expected to start decreasing in the future.

Among the 4213 facilities that responded to the facility survey questionnaire, the number of bedside consoles was 121 863, an increase of 3241 (2.7%) from the previous year. The total number of patients who can concurrently receive dialysis in all facilities was 119 927 and the maximum dialysis capacity was 405 581 patients in 2011, increases of 2.7 and 2.5% from the previous year, respectively.

The percentage of patients who underwent daytime dialysis increased to 83.3%, an increase of 0.8 points from the previous year (82.5%). In contrast, 13.4% of patients underwent nighttime dialysis, a decrease of 0.7 points from the previous year (14.1%). The trends toward more daytime dialysis patients and less nighttime dialysis patients were continuously observed over the last 10 years.

The number of patients who underwent HD at home was 327, an increase of 50 (18.1%) from the previous year (277 patients). The number of patients who underwent HD at home has been increasing rapidly since 2006.

The number of PD + HD patients, which started to be surveyed at the end of 2009, was 1902 at the end of 2011. The number of non-PD + catheter patients was 369. The number of PD dropout patients in 2011 was 175.

According to the patient survey, the longest period on dialysis was 43 years and 9 months.

The number of dialysis patients per million has increased continuously, reaching 2385.4 at the end of 2011 (Tables 1 and 2). According to a data report

TABLE 2. *Changes in dialysis patient population in Japan (from the facility survey)*

Year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Dialysis patient population at the end of each year	116 303	123 926	134 298	143 709	154 413	167 192	175 988	185 322	197 213	206 134	219 183
Number of patients started on dialysis each year	20 877	22 475	23 874	24 296	26 398	28 409	28 870	29 641	31 483	32 018	33 243
Number of dialysis patients who died each year	9 722	11 621	12 143	13 187	14 406	15 174	16 102	16 687	18 524	18 938	19 850
Number of patients per million	943.8	995.8	1 076.4	1 149.4	1 229.7	1 328.4	1 394.9	1 465.2	1 556.7	1 624.1	1 721.9
Collection rate for facility survey† (%)	99.3	99.4	99.5	99.7	99.8	99.8	99.7	99.7	99.7	99.9	99.0
Year	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	
Dialysis patient population at the end of each year	229 538	237 710	248 166	257 765	264 473	275 242	283 421	290 661	298 252	304 856	
Number of patients started on dialysis each year	33 710	33 966	35 094	36 063	36 373	36 934	38 180	37 566	37 512	38 613	
Number of dialysis patients who died each year	20 614	21 672	22 715	23 983	24 034	25 253	27 266	27 646	28 882	30 743	
Number of patients per million	1 801.2	1 862.7	1 943.5	2 017.6	2 069.9	2 154.2	2 219.6	2 279.5	2 329.1	2 385.4	
Collection rate for facility survey† (%)	99.6	99.1	98.7	98.9	98.4	98.9	99.0	98.5	98.6	99.0	

†Based on the number of facilities.

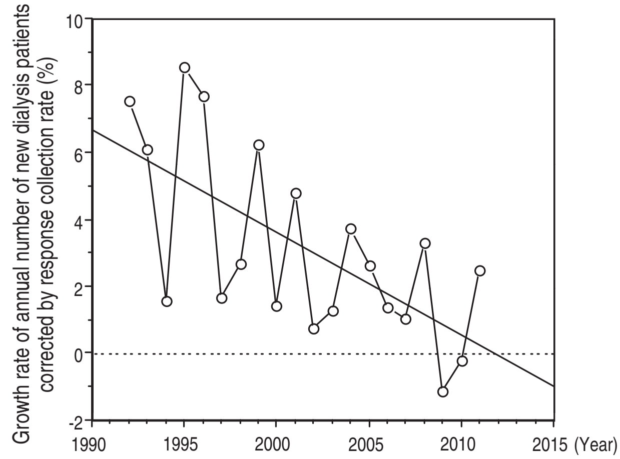

FIG. 1. Change in growth rate of annual number of new dialysis patients corrected by response collection rate.

from the United States Renal Data System (USRDS) (6), Japan has the second largest dialysis patient population per general population after Taiwan (a comparison based on the data at the end of 2009). Japan also has the second largest number of dialysis patients after the US. Table 3 shows the total number of dialysis patients in each prefecture of Japan determined from the facility survey.

Mean age

The dialysis patient population in Japan is aging yearly. Table 4 shows changes in the mean age of patients obtained from the patient survey. The mean age of new patients who were started on dialysis in 2011 was 67.8 years (±13.4, ± SD here and hereafter) compared with a mean age of 66.6 years (±12.6) among all dialysis patients in 2011. The dialysis patient population aged by 6.3 years from the end of

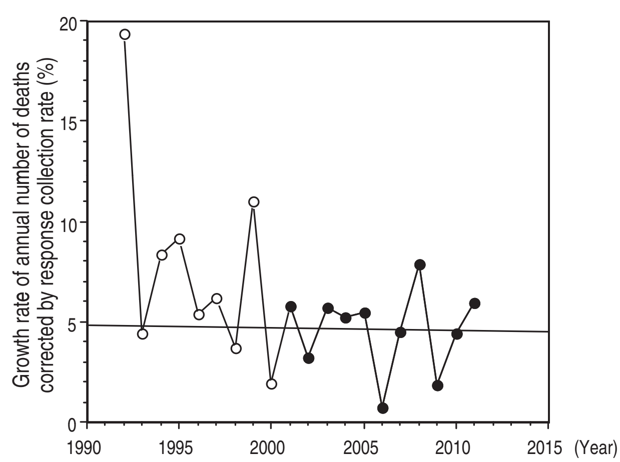

FIG. 2. Change in growth rate of annual number of deaths corrected by response collection rate.

TABLE 3. *Numbers of dialysis patients regularly undergoing dialysis in prefectures*

Names of prefectures	Daytime	Nighttime	Home HD	PD	Total[†]
Hokkaido	12 877	1 282	8	426	14 593
Aomori Prefecture	3 011	241	0	83	3 335
Iwate Prefecture	2 455	327	0	134	2 916
Miyagi Prefecture	3 921	891	0	55	4 867
Akita Prefecture	1 680	142	0	60	1 882
Yamagata Prefecture	2 037	294	5	97	2 433
Fukushima Prefecture	3 992	376	0	193	4 561
Ibaraki Prefecture	6 315	819	1	129	7 264
Tochigi Prefecture	4 821	689	1	36	5 547
Gunma Prefecture	4 539	674	0	92	5 305
Saitama Prefecture	13 482	1 796	68	329	15 675
Chiba Prefecture	11 344	1 628	3	280	13 255
Tokyo	23 243	4 987	27	1064	29 321
Kanagawa Prefecture	15 008	2 993	19	612	18 632
Niigata Prefecture	3 760	1 001	1	156	4 918
Toyama Prefecture	2 007	268	3	85	2 363
Ishikawa Prefecture	2 240	347	0	91	2 678
Fukui Prefecture	1 469	174	1	79	1 723
Yamanashi Prefecture	1 960	201	1	67	2 229
Nagano Prefecture	4 056	650	1	142	4 849
Gifu Prefecture	3 749	671	5	120	4 545
Shizuoka Prefecture	8 379	1 254	5	236	9 874
Aichi Prefecture	12 654	3 181	34	654	16 523
Mie Prefecture	3 427	541	5	104	4 077
Shiga Prefecture	2 280	425	18	139	2 862
Kyoto Prefecture	4 727	1 083	3	202	6 015
Osaka Prefecture	18 772	2 744	38	592	22 146
Hyogo Prefecture	10 683	1 705	45	318	12 751
Nara Prefecture	2 806	277	6	124	3 213
Wakayama Prefecture	2 495	318	2	31	2 846
Tottori Prefecture	1 215	134	0	87	1 436
Shimane Prefecture	1 239	148	0	77	1 464
Okayama Prefecture	3 750	556	2	236	4 544
Hiroshima Prefecture	6 149	620	9	420	7 198
Yamaguchi Prefecture	2 905	351	0	162	3 418
Tokushima Prefecture	2 212	274	1	179	2 666
Kagawa Prefecture	2 157	136	6	230	2 529
Ehime Prefecture	3 085	370	1	153	3 609
Kochi Prefecture	1 936	299	0	37	2 272
Fukuoka Prefecture	10 766	2 355	2	625	13 748
Saga Prefecture	1 788	324	1	22	2 135
Nagasaki Prefecture	3 222	444	2	172	3 840
Kumamoto Prefecture	4 890	922	1	135	5 948
Oita Prefecture	3 295	360	1	161	3 817
Miyazaki Prefecture	3 024	561	0	54	3 639
Kagoshima Prefecture	4 585	505	1	96	5 187
Okinawa Prefecture	3 509	633	0	66	4 208
Total	253 916	40 971	327	9642	304 856

[†]The total number of patients regularly undergoing dialysis is the total in the column for the number of patients in Sheet I, and does not necessarily agree with the total number of patients counted in accordance with the method of dialysis.

1991 to the end of 2001 and by 5.0 years from the end of 2001 to the end of 2011. Thus, the rate of aging of the dialysis patient population decreased. Similarly, the mean age of new patients who were started on dialysis increased by 6.1 years from the end of 1991 to the end of 2001, but by only 3.6 years from the end of 2001 to the end of 2011. These findings show that the rate of aging of new dialysis patients also decreased.

Tables 5 and 6 show the gender and age distributions of patients who started dialysis in 2011 and all dialysis patients in 2011, respectively. Tables 7 and 8 show summaries of the primary diseases of patients

TABLE 4. *Changes in mean ages of new patients started on dialysis and of all the dialysis patients at the end of each year*

	'91	'92	'93	'94	'95	'96	'97	'98	'99	'00	'01	'02	'03	'04	'05	'06	'07	'08	'09	'10	'11
Mean age of all the dialysis patients at the end of each year	55.3	56.0	56.6	57.3	58.0	58.6	59.2	59.9	60.6	61.2	61.6	62.2	62.8	63.3	63.9	64.4	64.9	65.3	65.8	66.2	66.6
±S.D.	13.5	13.5	13.5	13.5	13.4	13.4	13.4	13.3	13.3	13.2	13.1	13.0	12.9	12.9	12.8	12.8	12.7	12.7	12.6	12.6	12.6
Mean age of new patients started on dialysis each year	58.1	59.5	59.8	60.4	61.0	61.5	62.2	62.7	63.4	63.8	64.2	64.7	65.4	65.8	66.2	66.4	66.8	67.2	67.3	67.8	67.8
±S.D.	14.6	14.5	14.4	14.3	14.2	14.2	14.0	13.9	13.9	13.9	13.7	13.6	13.5	13.4	13.4	13.4	13.3	13.3	13.3	13.3	13.4

who were started on dialysis in 2011 and all dialysis patients in 2011, respectively (mean ages also shown). The data in these tables were obtained from the patient survey.

Primary diseases of dialysis patients

Table 7 shows a summary of the primary diseases of patients who were started on dialysis in 2011 and Table 8 shows that of all dialysis patients at the end of 2011.

Table 9 shows changes in the percentage of new patients who were started on dialysis each year with various primary causes of renal failure (primary diseases). The percentage of new patients with diabetic nephropathy as the primary disease was the highest (44.3%), followed by chronic glomerulonephritis (20.2%). The number and percentage of new patients who had diabetic nephropathy as the primary disease and were started on dialysis continued to increase until the end of 2009, but the number and percentage decreased for the first time at the end of 2010 (2). However, they again increased at the end of 2011 (16 247 [43.6%] in 2010 and 16 803 [44.3%] in 2011). Here, changes in the growth rate of the annual number of patients who had chronic glomerulonephritis or diabetic nephropathy as the primary disease and were started on dialysis were estimated using a similar method adopted to estimate the annual growth rate of new dialysis patient population (Fig. 3). Here, the growth rate of the annual number of new dialysis patients shown in Figure 3 was calculated on the basis of the number of patients obtained by proportional correction so that the annual number of new dialysis patients determined in the patient

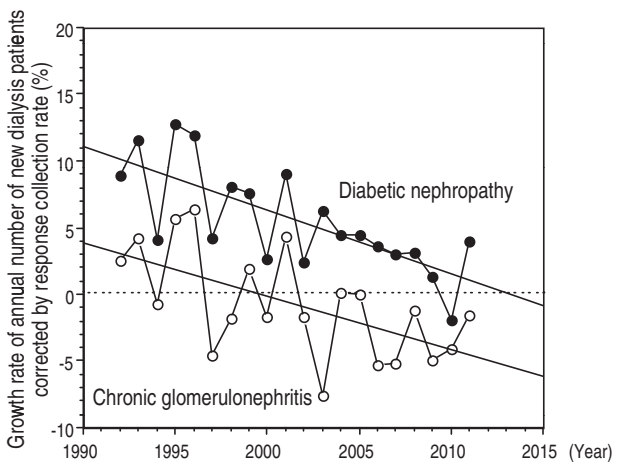

FIG. 3. Change in growth rate of annual number of new dialysis patients corrected by response collection rate (among patients with chronic glomerulonephritis or diabetic nephropathy as primary disease).

TABLE 5. *Number of new patients started on dialysis in 2011 for different ages and both genders*

Age at introduction into dialysis	Male	Female	Subtotal	Total
<5	4 (0.0)	5 (0.0)	9 (0.0)	9 (0.0)
5~9	5 (0.0)	1 (0.0)	6 (0.0)	6 (0.0)
10~14	12 (0.0)	4 (0.0)	16 (0.0)	16 (0.0)
15~19	15 (0.1)	14 (0.1)	29 (0.1)	29 (0.1)
20~24	58 (0.2)	25 (0.2)	83 (0.2)	83 (0.2)
25~29	119 (0.5)	66 (0.5)	185 (0.5)	185 (0.5)
30~34	231 (0.9)	109 (0.9)	340 (0.9)	340 (0.9)
35~39	470 (1.9)	211 (1.7)	681 (1.8)	681 (1.8)
40~44	848 (3.3)	315 (2.5)	1 163 (3.1)	1 163 (3.1)
45~49	1 022 (4.0)	395 (3.1)	1 417 (3.7)	1 417 (3.7)
50~54	1 410 (5.6)	504 (4.0)	1 914 (5.0)	1 914 (5.0)
55~59	2 207 (8.7)	833 (6.6)	3 040 (8.0)	3 040 (8.0)
60~64	3 678 (14.5)	1 439 (11.5)	5 117 (13.5)	5 117 (13.5)
65~69	3 286 (13.0)	1 408 (11.2)	4 694 (12.4)	4 694 (12.4)
70~74	3 761 (14.8)	1 823 (14.5)	5 584 (14.7)	5 584 (14.7)
75~79	3 948 (15.6)	2 159 (17.2)	6 107 (16.1)	6 107 (16.1)
80~84	2 806 (11.1)	1 875 (14.9)	4 681 (12.3)	4 681 (12.3)
85~89	1 209 (4.8)	1 066 (8.5)	2 275 (6.0)	2 275 (6.0)
90~94	262 (1.0)	265 (2.1)	527 (1.4)	527 (1.4)
95≤	23 (0.1)	50 (0.4)	73 (0.2)	73 (0.2)
Subtotal	25 374 (100.0)	12 567 (100.0)	37 941 (100.0)	37 941 (100.0)
No information available	3	2	5	5
Total	25 377	12 569	37 946	37 946
Mean age	66.91	69.73	67.84	67.84
S.D.	13.22	13.64	13.43	13.43

Values in parentheses on the right side of each figure represent the percentage relative to the total in each column.

TABLE 6. *Number of all dialysis patients in 2011 for different ages and both genders*

Age at introduction into dialysis	Male	Female	Subtotal	No information available	Total
<5	19 (0.0)	21 (0.0)	40 (0.0)		40 (0.0)
5~9	16 (0.0)	14 (0.0)	30 (0.0)		30 (0.0)
10~14	17 (0.0)	12 (0.0)	29 (0.0)		29 (0.0)
15~19	52 (0.0)	32 (0.0)	84 (0.0)		84 (0.0)
20~24	210 (0.1)	111 (0.1)	321 (0.1)		321 (0.1)
25~29	583 (0.3)	317 (0.3)	900 (0.3)		900 (0.3)
30~34	1 383 (0.7)	687 (0.6)	2 070 (0.7)		2 070 (0.7)
35~39	3 304 (1.8)	1 635 (1.5)	4 939 (1.7)		4 939 (1.7)
40~44	6 153 (3.3)	2 809 (2.5)	8 962 (3.0)		8 962 (3.0)
45~49	8 434 (4.6)	3 964 (3.6)	12 398 (4.2)		12 398 (4.2)
50~54	11 707 (6.3)	5 922 (5.4)	17 629 (6.0)	1 (100.0)	17 630 (6.0)
55~59	18 363 (9.9)	9 809 (8.9)	28 172 (9.5)		28 172 (9.5)
60~64	31 990 (17.3)	16 965 (15.3)	48 955 (16.6)		48 955 (16.6)
65~69	26 909 (14.5)	15 294 (13.8)	42 203 (14.3)		42 203 (14.3)
70~74	27 895 (15.1)	16 686 (15.1)	44 581 (15.1)		44 581 (15.1)
75~79	24 412 (13.2)	15 288 (13.8)	39 700 (13.4)		39 700 (13.4)
80~84	15 439 (8.3)	11 966 (10.8)	27 405 (9.3)		27 405 (9.3)
85~89	6 580 (3.6)	6 696 (6.1)	13 276 (4.5)		13 276 (4.5)
90~94	1 508 (0.8)	2 026 (1.8)	3 534 (1.2)		3 534 (1.2)
95≤	183 (0.1)	319 (0.3)	502 (0.2)		502 (0.2)
Subtotal	185 157 (100.0)	110 573 (100.0)	295 730 (100.0)	1 (100.0)	295 731 (100.0)
No information available	2	2	4		4
Total	185 159	110 575	295 734	1	295 735
Mean age	65.76	67.87	66.55	51.00	66.55
S.D.	12.40	12.72	12.56		12.56

Values in parentheses on the right side of each figure represent the percentage relative to the total in each column.

TABLE 7. *Number of new patients started on dialysis in 2011 for different primary diseases and their mean age*

Primary disease	Number of patients	No information on birth date	Total	Mean age	S.D.
Chronic glomerulonephritis	7 669	1	7 670	67.55	14.59
(%)	(20.2)	(20.0)	(20.2)		
Chronic pyelonephritis	249		249	68.51	14.99
(%)	(0.7)		(0.7)		
Rapidly progressive glomerulonephritis	486		486	70.47	12.70
(%)	(1.3)		(1.3)		
Nephropathy of pregnancy/pregnancy toxemia	48		48	59.98	15.41
(%)	(0.1)		(0.1)		
Other nephritides that cannot be classified	131		131	61.24	19.95
(%)	(0.3)		(0.3)		
Polycystic kidney	957		957	61.69	13.31
(%)	(2.5)		(2.5)		
Nephrosclerosis	4 475		4 475	74.21	11.49
(%)	(11.8)		(11.8)		
Malignant hypertension	288		288	63.69	16.42
(%)	(0.8)		(0.8)		
Diabetic nephropathy	16 801	2	16 803	66.13	11.96
(%)	(44.3)	(40.0)	(44.3)		
SLE nephritis	283		283	62.17	16.28
(%)	(0.7)		(0.7)		
Amyloidal kidney	114		114	67.35	11.92
(%)	(0.3)		(0.3)		
Gouty kidney	91		91	64.14	12.98
(%)	(0.2)		(0.2)		
Renal failure due to congenital abnormality of metabolism	28		28	46.79	24.36
(%)	(0.1)		(0.1)		
Kidney and urinary tract tuberculosis	13		13	77.23	5.95
(%)	(0.0)		(0.0)		
Kidney and urinary tract stone	66		66	69.39	9.71
(%)	(0.2)		(0.2)		
Kidney and urinary tract tumor	177		177	72.90	9.85
(%)	(0.5)		(0.5)		
Obstructive urinary tract desease	115		115	66.86	16.37
(%)	(0.3)		(0.3)		
Myeloma	147		147	70.49	10.88
(%)	(0.4)		(0.4)		
Hypoplastic kidney	45		45	35.71	23.50
(%)	(0.1)		(0.1)		
Undetermined	4 142	2	4 144	71.18	13.42
(%)	(10.9)	(40.0)	(10.9)		
Reintroduction after transplantation	243		243	57.11	16.30
(%)	(0.6)		(0.6)		
Others	1 329		1 329	68.37	14.99
(%)	(3.5)		(3.5)		
Total	37 897	5	37 902	67.84	13.43
(%)	(100.0)	(100.0)	(100.0)		
No information available	44		44	68.59	16.26
Total	37 941	5	37 946	67.84	13.43

Values in parentheses under each figure represent the percentage relative to the total in each column.
The column "No information on birth date" shows the number of patients who provided no date of birth; thus, the calculation of age was impossible.

survey agrees with that determined in the facility survey (corrected by the response collection rate). The growth rate of the annual number of new dialysis patients with chronic glomerulonephritis and diabetic nephropathy showed a reverse of the downward trend in 2009 and 2010. However, such short-term fluctuation was frequently observed in the past. The growth rate of the annual numbers of new dialysis patients with chronic glomerulonephritis and diabetic nephropathy clearly tended to decrease over the last 20 years. The growth rate of the annual number of new dialysis patients with chronic

TABLE 8. *Number of all dialysis patients in 2011 for different primary diseases and their mean age*

Primary disease	Number of patients	No information on birth date	Total	Mean age	S.D.
Chronic glomerulonephritis	102 758	1	102 759	65.38	12.65
(%)	(34.8)	(25.0)	(34.8)		
Chronic pyelonephritis	2 986		2 986	64.43	13.98
(%)	(1.0)		(1.0)		
Rapidly progressive glomerulonephritis	2 169		2 169	67.22	13.67
(%)	(0.7)		(0.7)		
Nephropathy of pregnancy/pregnancy toxemia	1 735		1 735	62.62	9.96
(%)	(0.6)		(0.6)		
Other nephritides that cannot be classified	1 300		1 300	59.54	16.86
(%)	(0.4)		(0.4)		
Polycystic kidney	10 097		10 097	64.13	11.24
(%)	(3.4)		(3.4)		
Nephrosclerosis	23 295		23 295	73.62	11.86
(%)	(7.9)		(7.9)		
Malignant hypertension	2 343		2 343	63.73	14.69
(%)	(0.8)		(0.8)		
Diabetic nephropathy	108 458	2	108 460	66.73	11.13
(%)	(36.7)	(50.0)	(36.7)		
SLE nephritis	2 387		2 387	59.62	13.86
(%)	(0.8)		(0.8)		
Amyloidal kidney	493		493	65.57	11.46
(%)	(0.2)		(0.2)		
Gouty kidney	1 175		1 175	66.41	11.64
(%)	(0.4)		(0.4)		
Renal failure due to congenital abnormality of metabolism	291		291	49.09	17.74
(%)	(0.1)		(0.1)		
Kidney and urinary tract tuberculosis	277		277	71.39	9.30
(%)	(0.1)		(0.1)		
Kidney and urinary tract stone	588		588	70.08	11.02
(%)	(0.2)		(0.2)		
Kidney and urinary tract tumor	817		817	71.42	11.37
(%)	(0.3)		(0.3)		
Obstructive urinary tract desease	720		720	61.36	17.78
(%)	(0.2)		(0.2)		
Myeloma	229		229	69.88	11.34
(%)	(0.1)		(0.1)		
Hypoplastic kidney	590		590	42.21	19.03
(%)	(0.2)		(0.2)		
Undetermined	24 317	1	24 318	68.92	13.19
(%)	(8.2)	(25.0)	(8.2)		
Reintroduction after transplantation	2 162		2 162	55.06	12.76
(%)	(0.7)		(0.7)		
Others	6 502		6 502	64.66	15.78
(%)	(2.2)		(2.2)		
Total	295 689	4	295 693	66.55	12.56
(%)	(100.0)	(100.0)	(100.0)		
No information available	42		42	67.31	16.80
Total	295 731	4	295 735	66.55	12.56

Values in parentheses under each figure represent the percentage relative to the total in each column.
The column "No information on birth date" shows the number of patients who provided no date of birth; thus, the calculation of age was impossible.

glomerulonephritis has been negative since around 2001, indicating that the number of new dialysis patients with chronic glomerulonephritis has tended to decrease. The growth rate of the annual number of new dialysis patients with diabetic nephropathy will also become negative in approximately 2012. In other words, the number of new dialysis patients with diabetic nephropathy is expected to decrease.

Nephrosclerosis was the third most common primary disease (11.8%) after diabetic nephropathy and chronic glomerulonephritis. In relation to the aging of new dialysis patients, the percentage of

TABLE 9. *Changes in percentage of new patients started on dialysis each year with various primary diseases*

Year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Diabetic nephropathy	28.1	28.4	29.9	30.7	31.9	33.1	33.9	35.7	36.2	36.6	38.1	39.1	41.0	41.3	42.0	42.9	43.4	43.3	44.5	43.6	44.3
Chronic glomerulonephritis	44.2	42.2	41.4	40.5	39.4	38.9	36.6	35.0	33.6	32.5	32.4	31.9	29.1	28.1	27.4	25.6	23.8	22.8	21.9	21.0	20.2
Nephrosclerosis	5.5	5.9	6.2	6.1	6.3	6.4	6.8	6.7	7.0	7.6	7.6	7.8	8.5	8.8	9.0	9.4	10.0	10.6	10.7	11.7	11.8
Polycystic kidney	3.0	2.7	2.6	2.5	2.4	2.5	2.4	2.4	2.2	2.4	2.3	2.4	2.3	2.7	2.3	2.4	2.3	2.5	2.3	2.4	2.5
Rapidly progressive glomerulonephritis	0.6	0.7	0.8	0.8	0.8	0.8	1.1	0.9	0.9	1.0	1.0	1.1	1.2	1.1	1.1	1.2	1.3	1.2	1.2	1.2	1.3
SLE nephritis	1.3	1.3	1.2	1.2	1.1	1.3	1.0	1.1	1.2	0.9	1.0	0.9	0.7	0.8	0.8	0.8	0.8	0.8	0.7	0.8	0.7
Chronic pyelonephritis	1.7	1.6	1.1	1.4	1.2	1.1	1.2	1.1	1.1	1.0	1.1	0.9	1.0	0.9	1.0	0.8	0.8	0.7	0.7	0.8	0.7
Undetermined	3.7	3.7	3.3	3.9	4.5	5.0	5.5	5.6	6.1	7.6	9.0	8.4	8.8	9.3	9.5	9.9	10.2	10.6	10.7	10.7	10.9

patients who had nephrosclerosis and were started on dialysis continued to increase steadily. The percentage of patients with "unspecified" primary diseases was the fourth highest (10.9%). In addition, polycystic kidney disease, rapidly progressive glomerulonephritis, systemic lupus erythematosus (SLE) nephritis, and chronic pyelonephritis were also observed as primary diseases. However, the percentages of new patients with these primary diseases among all new dialysis patients were 0.7–2.5% each, which was much smaller than the percentages of patients with the above-mentioned top three primary diseases and unspecified diseases, and showed no marked increase or decrease over 20 years.

Table 10 shows changes in the percentages of all dialysis patients with various primary diseases at the end of each year. Since the first survey of primary diseases in 1977, chronic glomerulonephritis had been the most common primary disease among all dialysis patients. However, the percentage of patients with diabetic nephropathy (36.7%) exceeded that of patients with chronic glomerulonephritis (34.8%) at the end of 2011. In that year, diabetic nephropathy became the most common primary disease among all dialysis patients. For new dialysis patients, diabetic nephropathy replaced chronic glomerulonephritis as the most common primary disease in 1998 and has remained in this position (Table 9). Diabetic nephropathy became the most common primary disease among all dialysis patients following the trend of new dialysis patients.

The primary disease with the third highest percentage of patients among all dialysis patients in 2011 was unspecified primary diseases (8.2%). The percentage of patients with nephrosclerosis among all dialysis patients was 7.9% and continuously increased. In addition, polycystic kidney disease, chronic pyelonephritis, SLE nephritis, and rapidly progressive glomerulonephritis were also observed as primary diseases. However, the percentages of patients with these primary diseases were only 0.7–3.4% each and showed no marked increase or decrease over the 20-year survey period.

Causes of death

Table 11 shows the classification of causes of death of patients who were started on dialysis in 2011 and who died by the end of 2011. Although the leading cause of death of patients who were started on dialysis in 2011 was infectious diseases, until the previous year it was cardiac failure (25.0%) in the 2011 survey, followed by infectious diseases (24.5%), malignant tumors (11.6%), others (10.7%), unspecified causes (7.9%), and cerebrovascular disorder (5.4%).

Table 12 shows the classification of the causes of death of all dialysis patients who died in 2011. Table 13 shows changes in the percentages of the leading causes of death in all dialysis patients. Among all dialysis patients, the leading cause of death in 2011 was cardiac failure at a percentage of 26.6%. The percentage of patients who died of cardiac failure among all dialysis patients markedly decreased in the

TABLE 10. *Changes in percentage of all dialysis patients at the end of each year with various primary diseases*

Year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Diabetic nephropathy	16.4	17.1	18.2	19.2	20.4	21.6	22.7	24.0	25.1	26.0	27.2	28.1	29.2	30.2	31.4	32.3	33.4	34.2	35.1	35.9	36.7
Chronic glomerulonephritis	61.7	60.4	58.8	57.7	56.6	55.4	54.1	52.5	51.1	49.7	49.6	48.2	46.6	45.1	43.6	42.2	40.4	39.0	37.6	36.2	34.8
Nephrosclerosis	2.9	3.1	3.4	3.6	3.8	4.0	4.2	4.4	4.5	4.8	5.0	5.1	5.3	5.7	5.9	6.2	6.5	6.8	7.1	7.5	7.9
Polycystic kidney	3.3	3.3	3.3	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.3	3.3	3.3	3.4	3.3	3.4	3.4	3.4	3.4	3.4	3.4
Chronic pyelonephritis	2.1	2.0	1.9	1.8	1.7	1.6	1.6	1.5	1.5	1.4	1.4	1.3	1.3	1.3	1.2	1.2	1.2	1.1	1.1	1.1	1.0
SLE nephritis	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8
Rapidly progressive glomerulonephritis	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7
Undetermined	2.9	2.9	2.9	3.1	3.2	3.6	3.9	4.2	4.4	5.0	5.6	5.9	6.3	6.4	6.6	7.0	7.4	7.6	7.7	8.0	8.2

TABLE 11. *Classification of causes of death of new patients who were started on dialysis and died in 2011*

Cause of death	Male	Female	Subtotal	Total
Cardiac failure	457	277	734	734
(%)	(23.7)	(27.4)	(25.0)	(25.0)
Cerebrovascular disorder	93	66	159	159
(%)	(4.8)	(6.5)	(5.4)	(5.4)
Infectious disease	491	229	720	720
(%)	(25.5)	(22.7)	(24.5)	(24.5)
Hemorrhage	51	21	72	72
(%)	(2.6)	(2.1)	(2.5)	(2.5)
Malignant tumor	238	103	341	341
(%)	(12.4)	(10.2)	(11.6)	(11.6)
Cachexia/Uremia	60	46	106	106
(%)	(3.1)	(4.5)	(3.6)	(3.6)
Cardiac infarction	70	32	102	102
(%)	(3.6)	(3.2)	(3.5)	(3.5)
Potassium poisoning/Sudden death	32	13	45	45
(%)	(1.7)	(1.3)	(1.5)	(1.5)
Chronic hepatitis/Cirrhosis	38	13	51	51
(%)	(2.0)	(1.3)	(1.7)	(1.7)
Suicide/Refusal of treatment (dialysis)	16	6	22	22
(%)	(0.8)	(0.6)	(0.7)	(0.7)
Intestinal obstruction	18	9	27	27
(%)	(0.9)	(0.9)	(0.9)	(0.9)
Pulmonary thrombus/Pulmonary embolus	5	3	8	8
(%)	(0.3)	(0.3)	(0.3)	(0.3)
Death due to disaster	4	1	5	5
(%)	(0.2)	(0.1)	(0.2)	(0.2)
Other causes	203	110	313	313
(%)	(10.5)	(10.9)	(10.7)	(10.7)
Unspecified	151	82	233	233
(%)	(7.8)	(8.1)	(7.9)	(7.9)
Subtotal	1927	1011	2938	2938
(%)	(100.0)	(100.0)	(100.0)	(100.0)
No information available	4	1	5	5
Total	1931	1012	2943	2943

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

1990s and, after that, remained almost unchanged. The second leading cause of death among all dialysis patients was infectious diseases at 20.3%, which also remained almost unchanged in recent years but tended to gradually increase over the last 20 years. The percentage of patients who died of malignant tumors was 9.1%, which was lower than that in the previous year. However, it tended to gradually increase over the years. The percentage of patients who died of cerebrovascular disorder has continued to decrease since 1995 and reached 7.7% in 2011. The percentage of patients who died of myocardial infarction was 4.6% in 2011, remaining almost unchanged from 2005 although it tended to gradually decrease from a peak of 8.4% in 1997.

Note that the classification codes for the causes of death were considerably changed in the 2003 and 2010 surveys. For details of these changes, please refer to the 2010 survey report (2).

Annual crude death rate

The annual crude death rate was calculated from the facility survey data. Table 14 shows the percentage of patients who died in a given year with respect to the mean annual number of dialysis patients. The annual crude death rate in 2011 was 10.2%, which exceeded 10% for the first time in the last 20 years. Table 14 shows changes in the annual crude death rate from 1991, which has gradually increased since 2000 despite its short-term increase or decrease. As mentioned above, the increase in dialysis patient population has slowed down, whereas the annual number of deaths continues to increase. This is considered to result in the increase in the annual crude death rate. The increase in the annual number of deaths is considered to be due to the increase in the number of patients with a poor prognosis, such as older patients who were started on dialysis and patients with diabetic nephropathy and nephrosclerosis.

TABLE 12. *Classification of causes of death of dialysis patients who died in 2011*

Cause of death	Male	Female	Subtotal	Total
Cardiac failure	4 678	2 991	7 669	7 669
(%)	(25.3)	(28.8)	(26.6)	(26.6)
Cerebrovascular disorder	1 367	841	2 208	2 208
(%)	(7.4)	(8.1)	(7.7)	(7.7)
Infectious disease	3 890	1 976	5 866	5 866
(%)	(21.1)	(19.1)	(20.3)	(20.3)
Hemorrhage	318	181	499	499
(%)	(1.7)	(1.7)	(1.7)	(1.7)
Malignant tumor	1 915	718	2 633	2 633
(%)	(10.4)	(6.9)	(9.1)	(9.1)
Cachexia/Uremia	596	532	1 128	1 128
(%)	(3.2)	(5.1)	(3.9)	(3.9)
Cardiac infarction	916	424	1 340	1 340
(%)	(5.0)	(4.1)	(4.6)	(4.6)
Potassium poisoning/Sudden death	583	261	844	844
(%)	(3.2)	(2.5)	(2.9)	(2.9)
Chronic hepatitis/Cirrhosis	217	84	301	301
(%)	(1.2)	(0.8)	(1.0)	(1.0)
Suicide/Refusal of treatment (dialysis)	155	52	207	207
(%)	(0.8)	(0.5)	(0.7)	(0.7)
Intestinal obstruction	163	118	281	281
(%)	(0.9)	(1.1)	(1.0)	(1.0)
Pulmonary thrombus/Pulmonary embolus	53	31	84	84
(%)	(0.3)	(0.3)	(0.3)	(0.3)
Death due to disaster	163	82	245	245
(%)	(0.9)	(0.8)	(0.8)	(0.8)
Other causes	1 429	997	2 426	2 426
(%)	(7.7)	(9.6)	(8.4)	(8.4)
Unspecified	2 028	1 082	3 110	3 110
(%)	(11.0)	(10.4)	(10.8)	(10.8)
Subtotal	18 471	10 370	28 841	28 841
(%)	(100.0)	(100.0)	(100.0)	(100.0)
No information available	16	3	19	19
Total	18 487	10 373	28 860	28 860

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

Cumulative survival rate of new patients who were started on dialysis each year

The cumulative survival rates of new patients who were started on dialysis from 1983 are summarized by year of introduction (Table 15). The one- to 10-year survival rates have been increasing since 1992 for patients who were started on dialysis around 1992 or later. The clinical use of genetically modified human erythropoietin started around this time. Therefore, the above trend may be due to the improvement of anemia as a result of using erythropoietin from the initial phase of dialysis.

Items associated with uric acid

Gender, age, and serum uric acid level

Tables 16 and 17 show the numbers of patients and their predialysis serum uric acid levels who underwent HD at facilities three times per week for both genders and various age groups, respectively. The predialysis serum uric acid level was lower among females than males. Moreover, the predialysis serum uric acid level tended to decrease with increasing age.

Period on dialysis and serum uric acid level

Table 18 shows the number of patients and their predialysis serum uric acid levels who underwent HD at facilities three times per week for different periods on dialysis. The serum uric acid level increased slightly with period on dialysis.

Primary diseases and serum uric acid level

Table 19 shows the number of patients and their predialysis serum uric acid levels who underwent HD at facilities three times per week for different primary diseases. The serum uric acid levels were compared among patients with the four common primary diseases, i.e. diabetic nephropathy, chronic glomerulonephritis, nephrosclerosis, and polycystic kidney

TABLE 13. *Annual changes in major causes of death*

Year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Cardiac failure	30.5	31.1	29.9	28.2	25.4	24.1	23.9	24.1	24.3	23.2	25.5	25.1	25.0	25.1	25.8	24.9	24.0	23.7	23.6	27.0	26.6
Infectious disease	12.1	11.3	12.2	12.6	13.8	14.6	14.9	15.0	16.3	16.6	16.3	15.9	18.5	18.8	19.2	19.9	18.9	19.9	20.7	20.3	20.3
Malignant tumor	7.6	7.1	7.4	7.3	7.2	7.7	8.1	7.7	7.6	8.3	8.5	8.5	8.5	9.0	9.0	9.2	9.2	9.2	9.4	9.8	9.1
Cerebrovascular disease	13.7	13.6	13.5	14.1	13.5	12.9	12.6	12.1	11.3	11.3	11.6	11.2	10.7	10.6	9.8	9.4	8.9	8.6	8.4	8.1	7.7
Cardiac infarction	5.8	5.8	5.7	7.1	7.5	7.4	8.4	7.9	7.4	7.0	7.4	7.4	6.2	5.4	5.1	4.4	4.4	4.1	4.0	4.7	4.6
Others	4.4	4.5	4.1	4.5	5.8	6.3	6.7	7.0	7.7	7.9	9.1	9.0	9.7	10.3	9.1	9.5	9.7	9.7	10.0	6.6	8.4
Unspecified	1.8	2.5	2.6	2.8	3.2	2.5	3.5	3.9	3.6	8.1	5.7	6.6	5.6	6.5	7.3	8.3	10.3	10.9	10.6	10.9	10.8

TABLE 14. *Change in annual crude death rate*

Year	Crude death rate (%)
1991	8.9
1992	9.7
1993	9.4
1994	9.5
1995	9.7
1996	9.4
1997	9.4
1998	9.2
1999	9.7
2000	9.2
2001	9.3
2002	9.2
2003	9.3
2004	9.4
2005	9.5
2006	9.2
2007	9.4
2008	9.8
2009	9.6
2010	9.8
2011	10.2

disease. The mean serum uric acid level was highest for patients with chronic glomerulonephritis and was lowest for patients with diabetic nephropathy.

Dialysis methods and serum uric acid level

Table 20 shows the number of patients and their predialysis serum uric acid levels for different dialysis methods. For dialysis by extracorporeal circulation, the levels measured before the dialysis are shown. The mean predialysis serum uric acid level was in the range of 7.26–7.37 mg/dL for patients who underwent blood purification by extracorporeal circulation excluding HD at home. In contrast, the mean predialysis serum uric acid level was lower (6.56 mg/dL) for patients who underwent PD. The mean predialysis serum uric acid level was much lower (5.69 mg/dL) for patients who underwent HD at home. This might result from differences in dialysis dose, dialysis duration, and dialysis frequency per week among the patients who underwent HD at home. The data for patients who underwent HD at home requires careful interpretation because the number of such patients was only 214.

Current status of the use of antihyperuricemic drugs

Table 21 shows the number of patients and their predialysis serum uric acid levels who underwent HD at facilities three times per week and were treated or not treated with any antihyperuricemic drugs. Although K/Na citrate is not an antihyperuricemic drug, it is included as an antihyperuricemic drug here.

TABLE 15. *Cumulative survival rates of new patients started on dialysis since 1983*

Year of introduction	Number of patients	1-year survival rate	2-year survival rate	3-year survival rate	4-year survival rate	5-year survival rate	6-year survival rate	7-year survival rate	8-year survival rate	9-year survival rate	10-year survival rate	11-year survival rate	12-year survival rate	13-year survival rate	14-year survival rate
1983	9 856	0.818	0.746	0.680	0.631	0.587	0.553	0.520	0.482	0.453	0.422	0.393	0.369	0.345	0.326
1984	10 687	0.817	0.735	0.670	0.619	0.576	0.537	0.497	0.463	0.434	0.405	0.376	0.352	0.327	0.305
1985	11 582	0.794	0.719	0.659	0.608	0.561	0.519	0.483	0.442	0.411	0.383	0.358	0.334	0.309	0.287
1986	12 585	0.798	0.723	0.665	0.617	0.564	0.518	0.477	0.443	0.406	0.377	0.350	0.325	0.303	0.282
1987	13 510	0.814	0.737	0.670	0.605	0.554	0.504	0.459	0.423	0.390	0.361	0.335	0.311	0.290	0.268
1988	14 719	0.824	0.739	0.665	0.602	0.546	0.497	0.454	0.417	0.382	0.351	0.325	0.301	0.279	0.257
1989	14 505	0.848	0.760	0.686	0.616	0.559	0.510	0.464	0.425	0.390	0.358	0.332	0.306	0.284	0.263
1990	16 495	0.838	0.748	0.674	0.608	0.553	0.500	0.458	0.418	0.383	0.352	0.323	0.299	0.277	0.259
1991	18 151	0.827	0.734	0.660	0.596	0.537	0.486	0.442	0.404	0.372	0.341	0.315	0.290	0.269	0.251
1992	19 837	0.821	0.727	0.650	0.587	0.529	0.481	0.436	0.398	0.366	0.338	0.312	0.287	0.268	0.246
1993	20 814	0.832	0.741	0.665	0.596	0.540	0.489	0.444	0.405	0.372	0.342	0.315	0.290	0.267	0.248
1994	21 307	0.829	0.742	0.669	0.602	0.543	0.490	0.447	0.408	0.372	0.341	0.311	0.288	0.266	0.245
1995	22 796	0.840	0.753	0.678	0.609	0.551	0.502	0.459	0.420	0.385	0.352	0.323	0.298	0.274	0.250
1996	24 830	0.832	0.749	0.672	0.609	0.554	0.506	0.455	0.417	0.381	0.349	0.320	0.292	0.267	0.247
1997	25 391	0.837	0.751	0.679	0.618	0.561	0.511	0.466	0.423	0.386	0.353	0.323	0.294	0.270	0.248
1998	26 697	0.844	0.764	0.696	0.634	0.572	0.522	0.473	0.431	0.395	0.362	0.331	0.303	0.276	
1999	27 631	0.850	0.773	0.705	0.639	0.580	0.528	0.481	0.439	0.399	0.361	0.328	0.299		
2000	29 125	0.855	0.775	0.709	0.646	0.588	0.533	0.487	0.442	0.402	0.365	0.332			
2001	30 660	0.854	0.774	0.705	0.639	0.584	0.531	0.483	0.440	0.399	0.362				
2002	31 333	0.857	0.778	0.710	0.647	0.586	0.532	0.482	0.438	0.397					
2003	32 358	0.859	0.781	0.713	0.649	0.591	0.535	0.487	0.439						
2004	33 458	0.865	0.787	0.720	0.658	0.598	0.543	0.492							
2005	34 534	0.861	0.785	0.717	0.652	0.594	0.537								
2006	35 960	0.870	0.793	0.725	0.663	0.603									
2007	36 711	0.866	0.793	0.725	0.658										
2008	37 787	0.866	0.795	0.727											
2009	38 313	0.872	0.797												
2010	38 213	0.877													

TABLE 15. (continued) *Cumulative survival rates of new patients started on dialysis since 1983*

Year of introduction	Number of patients	15-year survival rate	16-year survival rate	17-year survival rate	18-year survival rate	19-year survival rate	20-year survival rate	21-year survival rate	22-year survival rate	23-year survival rate	24-year survival rate	25-year survival rate	26-year survival rate	27-year survival rate	28-year survival rate
1983	9 856	0.304	0.285	0.269	0.252	0.239	0.224	0.211	0.197	0.186	0.177	0.164	0.153	0.142	0.131
1984	10 687	0.286	0.268	0.251	0.237	0.224	0.209	0.196	0.186	0.177	0.165	0.156	0.147	0.140	
1985	11 582	0.268	0.250	0.233	0.219	0.205	0.189	0.176	0.165	0.153	0.144	0.134	0.126		
1986	12 585	0.265	0.248	0.231	0.218	0.206	0.194	0.181	0.170	0.160	0.151	0.142			
1987	13 510	0.250	0.235	0.217	0.200	0.186	0.176	0.166	0.156	0.145	0.135				
1988	14 719	0.239	0.223	0.208	0.194	0.183	0.171	0.158	0.147	0.138					
1989	14 505	0.245	0.229	0.213	0.199	0.188	0.175	0.164	0.153						
1990	16 495	0.242	0.226	0.209	0.193	0.181	0.170	0.158							
1991	18 151	0.233	0.217	0.202	0.189	0.175	0.164								
1992	19 837	0.229	0.212	0.197	0.182	0.168									
1993	20 814	0.231	0.214	0.198	0.184										
1994	21 307	0.225	0.210	0.195											
1995	22 796	0.229	0.211												
1996	24 830	0.227													
1997	25 391														
1998	26 697														
1999	27 631														
2000	29 125														
2001	30 660														
2002	31 333														
2003	32 358														
2004	33 458														
2005	34 534														
2006	35 960														
2007	36 711														
2008	37 787														
2009	38 313														
2010	38 213														

TABLE 16. *Predialysis serum uric acid levels (mg/dL) for both genders (for patients who underwent HD at facilities three times per week)*

Predialysis serum uric acid level (mg/dL)	Male	Female	Subtotal	No information available	Total
<3	295	205	500		500
(%)	(59.0)	(41.0)	(100.0)		
3~	869	692	1 561		1 561
(%)	(55.7)	(44.3)	(100.0)		
4~	4 376	2 739	7 115		7 115
(%)	(61.5)	(38.5)	(100.0)		
5~	16 213	10 085	26 298		26 298
(%)	(61.7)	(38.3)	(100.0)		
6~	35 603	22 192	57 795		57 795
(%)	(61.6)	(38.4)	(100.0)		
7~	41 115	24 460	65 575		65 575
(%)	(62.7)	(37.3)	(100.0)		
8~	26 641	14 824	41 465		41 465
(%)	(64.2)	(35.8)	(100.0)		
9~	11 021	5 627	16 648		16 649
(%)	(66.2)	(33.8)	(100.0)		
10~	5 036	2 095	7 131		7 131
(%)	(70.6)	(29.4)	(100.0)		
Subtotal	141 169	82 919	224 088		224 089
(%)	(63.0)	(37.0)	(100.0)		
No information available	7 520	4 553	12 073		12 073
(%)	(62.3)	(37.7)	(100.0)		
Total	148 689	87 472	236 161	1	236 162
(%)	(63.0)	(37.0)	(100.0)7		
Mean	7.30	7.19	7.26	9.90	7.26
S.D.	1.41	1.37	1.39		1.39

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

TABLE 17. *Predialysis serum uric acid levels (mg/dL) for various age groups (for patients who underwent HD at facilities three times per week)*

Predialysis serum uric acid level (mg/dL)	<15 years old	15 years old ~	30 years old ~	45 years old ~	60 years old ~	75 years old ~	90 years old ~	Subtotal	No information available	Total	Mean	S.D.
<3		2	16	66	207	199	10	500		500	70.32	12.22
(%)		(0.4)	(3.2)	(13.2)	(41.4)	(39.8)	(2.0)	(100.0)				
3~		2	28	166	607	700	58	1 561		1 561	72.50	11.39
(%)		(0.1)	(1.8)	(10.6)	(38.9)	(44.8)	(3.7)	(100.0)				
4~		10	147	770	2 929	3 051	208	7 115		7 115	71.97	11.35
(%)		(0.1)	(2.1)	(10.8)	(41.2)	(42.9)	(2.9)	(100.0)				
5~	1	51	709	3 640	11 267	9 994	636	26 298		26 298	70.29	11.75
(%)	(0.0)	(0.2)	(2.7)	(13.8)	(42.8)	(38.0)	(2.4)	(100.0)				
6~	1	149	2 340	9 866	26 360	18 137	938	57 791	4	57 795	68.15	12.09
(%)	(0.0)	(0.3)	(4.0)	(17.1)	(45.6)	(31.4)	(1.6)	(100.0)				
7~		242	3 391	13 377	30 848	16 990	727	65 575		65 575	66.27	12.21
(%)		(0.4)	(5.2)	(20.4)	(47.0)	(25.9)	(1.1)	(100.0)				
8~	2	249	2 884	9 318	19 963	8 734	315	41 465		41 465	64.52	12.40
(%)	(0.0)	(0.6)	(7.0)	(22.5)	(48.1)	(21.1)	(0.8)	(100.0)				
9~		119	1 421	4 067	8 021	2 956	65	16 649		16 649	63.08	12.48
(%)		(0.7)	(8.5)	(24.4)	(48.2)	(17.8)	(0.4)	(100.0)				
10~		80	843	1 954	3 193	1 031	30	7 131		7 131	61.05	13.13
(%)		(1.1)	(11.8)	(27.4)	(44.8)	(14.5)	(0.4)	(100.0)				
Subtotal	4	904	11 779	43 224	103 395	61 792	2987	224 085	4	224 089	66.73	12.43
(%)	(0.0)	(0.4)	(5.3)	(19.3)	(46.1)	(27.6)	(1.3)	(100.0)				
No information available	1	56	647	2 259	5 498	3 444	168	12 073		12 073	66.95	12.63
(%)	(0.0)	(0.5)	(5.4)	(18.7)	(45.5)	(28.5)	(1.4)	(100.0)				
Total	5	960	12 426	45 483	108 893	65 236	3155	236 158	4	236 162	66.75	12.44
(%)	(0.0)	(0.4)	(5.3)	(19.3)	(46.1)	(27.6)	(1.3)	(100.0)				
Mean	7.15	7.95	7.81	7.53	7.31	6.92	6.59	7.26	6.38	7.26		
S.D.	1.82	1.44	1.44	1.37	1.37	1.35	1.28	1.39	0.28	1.39		

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

TABLE 18. *Predialysis serum uric acid levels (mg/dL) for different periods on dialysis (for patients who underwent HD at facilities three times per week)*

Predialysis serum uric acid level (mg/dL)	<2 years	2 years ~	5 years ~	10 years ~	15 years ~	20 years ~	25 years ~	Subtotal	Mean	S.D.
<3	131	122	138	57	31	12	9	500	6.03	6.29
(%)	(26.2)	(24.4)	(27.6)	(11.4)	(6.2)	(2.4)	(1.8)	(100.0)		
3~	425	401	415	179	70	36	35	1 561	5.90	6.33
(%)	(27.2)	(25.7)	(26.6)	(11.5)	(4.5)	(2.3)	(2.2)	(100.0)		
4~	1 763	1 972	1 888	828	346	162	156	7 115	5.99	6.23
(%)	(24.8)	(27.7)	(26.5)	(11.6)	(4.9)	(2.3)	(2.2)	(100.0)		
5~	6 064	7 153	7 089	3 107	1 394	762	729	26 298	6.43	6.63
(%)	(23.1)	(27.2)	(27.0)	(11.8)	(5.3)	(2.9)	(2.8)	(100.0)		
6~	12 280	15 401	15 279	7 550	3 592	1843	1850	57 795	6.87	6.86
(%)	(21.2)	(26.6)	(26.4)	(13.1)	(6.2)	(3.2)	(3.2)	(100.0)		
7~	13 555	16 481	17 368	8 848	4 633	2359	2331	65 575	7.22	7.06
(%)	(20.7)	(25.1)	(26.5)	(13.5)	(7.1)	(3.6)	(3.6)	(100.0)		
8~	8 404	10 176	10 836	5 736	3 170	1681	1462	41 465	7.39	7.12
(%)	(20.3)	(24.5)	(26.1)	(13.8)	(7.6)	(4.1)	(3.5)	(100.0)		
9~	3 510	4 125	4 255	2 320	1 231	657	551	16 649	7.25	7.05
(%)	(21.1)	(24.8)	(25.6)	(13.9)	(7.4)	(3.9)	(3.3)	(100.0)		
10~	1 684	1 775	1 794	950	483	238	207	7 131	6.77	6.85
(%)	(23.6)	(24.9)	(25.2)	(13.3)	(6.8)	(3.3)	(2.9)	(100.0)		
Subtotal	47 816	57 606	59 062	29 575	14 950	7750	7330	224 089	7.00	6.94
(%)	(21.3)	(25.7)	(26.4)	(13.2)	(6.7)	(3.5)	(3.3)	(100.0)		
No information available	2 988	2 961	3 058	1 533	735	386	412	12 073	6.73	7.02
(%)	(24.7)	(24.5)	(25.3)	(12.7)	(6.1)	(3.2)	(3.4)	(100.0)		
Total	50 804	60 567	62 120	31 108	15 685	8136	7742	236 162	6.99	6.95
(%)	(21.5)	(25.6)	(26.3)	(13.2)	(6.6)	(3.4)	(3.3)	(100.0)		
Mean	7.23	7.22	7.24	7.32	7.41	7.42	7.35	7.26		
S.D.	1.45	1.39	1.39	1.37	1.34	1.34	1.30	1.39		

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

Approximately 17% of patients who responded to questions regarding antihyperuricemic drugs were treated with such a drug. Allopurinol was the antihyperuricemic drug most commonly used for these patients, whose percentage was 94.2% (34 659 patients). The percentage of patients treated with febuxostat, which recently became available, was 3.2%. There were only a few patients treated with benzbromarone or K/Na citrate.

The mean predialysis serum uric acid level was 7.37 mg/dL for patients not treated with antihyperuricemic drugs, whereas it was lower (6.78 mg/dL) for patients treated with allopurinol and much lower (5.90 mg/dL) for patients treated with febuxostat. However, the interpretation of the efficacy of febuxostat requires careful consideration because it has become available only recently and its use has not yet become widespread among dialysis patients.

History of gouty attacks

Table 22 shows the number of patients and their predialysis serum uric acid levels who underwent HD at facilities three times per week, classified by history of gouty attacks. Among the patients who responded to questions regarding gouty attacks, 3.9% had a history of gouty attacks. The mean predialysis serum uric acid level was slightly higher among patients who had a history of gouty attacks than among patients who did not have a history of such attacks.

Serum albumin and serum uric acid levels

Table 23 shows the number of patients and their predialysis serum albumin levels and predialysis serum uric acid levels who underwent HD at facilities three times per week. The higher the predialysis serum albumin level, the higher the predialysis serum uric acid level.

Body mass index (BMI) and serum uric acid level

Table 24 shows the number of patients and their BMIs and predialysis serum uric acid levels who underwent HD at facilities three times per week. BMI was calculated using height and postdialysis weight. BMI tended to increase linearly with increasing predialysis serum uric acid level.

The observed relationship of serum uric acid level with serum albumin level and BMI indicate that serum uric acid level is related to the nutritional state of patients.

TABLE 19. *Predialysis serum uric acid levels (mg/dL) for different primary diseases (for patients who underwent HD at facilities three times per week)*

Predialysis serum uric acid level (mg/dL)	Chronic glomerulo-nephritis	Chronic pyelo-nephritis	Rapidly progressive glomerulo-nephritis	Nephropathy of pregnancy/ pregnancy toxemia	Other nephritides that cannot be classified	Polycystic kidney	Nephro-sclerosis	Malignant hypertension	Diabetic nephropathy	SLE nephritis	Amyloidal kidney	Gouty kidney	Renal failure due to congenital abnormality of metabolism
<3	147	5	1	3	2	11	31	6	205	2		4	
(%)	(29.4)	(1.0)	(0.2)	(0.6)	(0.4)	(2.2)	(6.2)	(1.2)	(41.0)	(0.4)		(0.8)	
3~	419	24	8	5	9	50	132	6	693	8	5	6	
(%)	(26.8)	(1.5)	(0.5)	(0.3)	(0.6)	(3.2)	(8.5)	(0.4)	(44.4)	(0.5)	(0.3)	(0.4)	
4~	1 974	59	37	20	21	195	622	55	3 161	36	18	26	6
(%)	(27.7)	(0.8)	(0.5)	(0.3)	(0.3)	(2.7)	(8.7)	(0.8)	(44.4)	(0.5)	(0.3)	(0.4)	(0.1)
5~	7 622	235	189	99	88	863	2 167	200	11 573	136	56	110	18
(%)	(29.0)	(0.9)	(0.7)	(0.4)	(0.3)	(3.3)	(8.2)	(0.8)	(44.0)	(0.5)	(0.2)	(0.4)	(0.1)
6~	18 338	533	368	299	234	2006	4 623	396	23 694	406	100	201	49
(%)	(31.7)	(0.9)	(0.6)	(0.5)	(0.4)	(3.5)	(8.0)	(0.7)	(41.0)	(0.7)	(0.2)	(0.3)	(0.1)
7~	22 900	683	487	408	264	2424	5 169	532	24 102	492	94	251	55
(%)	(34.9)	(1.0)	(0.7)	(0.6)	(0.4)	(3.7)	(7.9)	(0.8)	(36.8)	(0.8)	(0.1)	(0.4)	(0.1)
8~	15 710	423	314	296	207	1490	3 244	336	13 743	387	60	172	38
(%)	(37.9)	(1.0)	(0.8)	(0.7)	(0.5)	(3.6)	(7.8)	(0.8)	(33.1)	(0.9)	(0.1)	(0.4)	(0.1)
9~	6 384	188	145	100	92	555	1 327	175	5 248	177	21	91	16
(%)	(38.3)	(1.1)	(0.9)	(0.6)	(0.6)	(3.3)	(8.0)	(1.1)	(31.5)	(1.1)	(0.1)	(0.5)	(0.1)
10~	2 680	87	65	42	50	205	581	85	2 227	68	8	60	21
(%)	(37.6)	(1.2)	(0.9)	(0.6)	(0.7)	(2.9)	(8.1)	(1.2)	(31.2)	(1.0)	(0.1)	(0.8)	(0.3)
Subtotal	76 174	2237	1614	1272	967	7799	17 896	1791	84 646	1712	362	921	203
(%)	(34.0)	(1.0)	(0.7)	(0.6)	(0.4)	(3.5)	(8.0)	(0.8)	(37.8)	(0.8)	(0.2)	(0.4)	(0.1)
No information available	3 898	96	78	52	41	391	865	95	4 508	112	19	29	14
(%)	(32.3)	(0.8)	(0.6)	(0.4)	(0.3)	(3.2)	(7.2)	(0.8)	(37.3)	(0.9)	(0.2)	(0.2)	(0.1)
Total	80 072	2333	1692	1324	1008	8190	18 761	1886	89 154	1824	381	950	217
(%)	(33.9)	(1.0)	(0.7)	(0.6)	(0.4)	(3.5)	(7.9)	(0.8)	(37.8)	(0.8)	(0.2)	(0.4)	(0.1)
Mean	7.39	7.36	7.40	7.48	7.50	7.28	7.24	7.42	7.11	7.53	7.01	7.47	7.63
S.D.	1.38	1.43	1.42	1.31	1.49	1.32	1.40	1.45	1.38	1.37	1.42	1.58	1.62

TABLE 19. (continued) *Predialysis serum uric acid levels (mg/dL) for different primary diseases (for patients who underwent HD at facilities three times per week)*

Predialysis serum uric acid level (mg/dL)	Kidney and urinary tract tuberculosis	Kidney and urinary tract stone	Kidney and urinary tract tumor	Obstructive urinary tract desease	Myeloma	Hypoplastic kidney	Undetermined	Reintroduction after trans-plantation	Others	Subtotal	No information available	Total
<3	1	2	4	2	2	1	51	6	14	500		500
(%)	(0.2)	(0.4)	(0.8)	(0.4)	(0.4)	(0.2)	(10.2)	(1.2)	(2.8)	(100.0)		
3~		3	6	3	2		150	4	28	1 561		1 561
(%)		(0.2)	(0.4)	(0.2)	(0.1)		(9.6)	(0.3)	(1.8)	(100.0)		
4~	4	16	19	10	9	3	639	39	146	7 115		7 115
(%)	(0.1)	(0.2)	(0.3)	(0.1)	(0.1)	(0.0)	(9.0)	(0.5)	(2.1)	(100.0)		
5~	24	46	63	47	21	31	2 142	100	468	26 298		26 298
(%)	(0.1)	(0.2)	(0.2)	(0.2)	(0.1)	(0.1)	(8.1)	(0.4)	(1.8)	(100.0)		
6~	62	114	161	129	29	94	4 536	302	1121	57 795		57 795
(%)	(0.1)	(0.2)	(0.3)	(0.2)	(0.1)	(0.2)	(7.8)	(0.5)	(1.9)	(100.0)		
7~	65	133	178	144	47	133	5 206	464	1343	65 574	1	65 575
(%)	(0.1)	(0.2)	(0.3)	(0.2)	(0.1)	(0.2)	(7.9)	(0.7)	(2.0)	(100.0)		
8~	36	95	134	90	28	99	3 280	343	940	41 465		41 465
(%)	(0.1)	(0.2)	(0.3)	(0.2)	(0.1)	(0.2)	(7.9)	(0.8)	(2.3)	(100.0)		
9~	13	35	36	41	10	42	1 376	191	386	16 649		16 649
(%)	(0.1)	(0.2)	(0.2)	(0.2)	(0.1)	(0.3)	(8.3)	(1.1)	(2.3)	(100.0)		
10~	4	14	14	23	8	22	592	89	186	7 131		7 131
(%)	(0.1)	(0.2)	(0.2)	(0.3)	(0.1)	(0.3)	(8.3)	(1.2)	(2.6)	(100.0)		
Subtotal	209	458	615	489	156	425	17 972	1538	4632	224 088	1	224 089
(%)	(0.1)	(0.2)	(0.3)	(0.2)	(0.1)	(0.2)	(8.0)	(0.7)	(2.1)	(100.0)		
No information available	9	23	33	20	13	21	1 325	75	356	12 073		12 073
(%)	(0.1)	(0.2)	(0.3)	(0.2)	(0.1)	(0.2)	(11.0)	(0.6)	(2.9)	(100.0)		
Total	218	481	648	509	169	446	19 297	1613	4988	236 161		236 162
(%)	(0.1)	(0.2)	(0.3)	(0.2)	(0.1)	(0.2)	(8.2)	(0.7)	(2.1)	(100.0)		
Mean	7.22	7.31	7.23	7.41	7.20	7.65	7.26	7.67	7.37	7.26	7.90	7.26
S.D.	1.23	1.42	1.36	1.44	1.64	1.31	1.44	1.44	1.45	1.39		1.39

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

TABLE 20. *Predialysis serum uric acid levels (mg/dL) for different dialysis methods (for all dialysis patients)*

Predialysis serum uric acid level (mg/dL)	Facility HD	HDF	Hemo-filtration	Hemo-adsorption	Home HD	PD	Total
<3	549	27		5	12	21	614
(%)	(89.4)	(4.4)		(0.8)	(2.0)	(3.4)	(100.0)
3~	1 697	54		1	15	101	1 868
(%)	(90.8)	(2.9)		(0.1)	(0.8)	(5.4)	(100.0)
4~	7 665	355	7	44	30	539	8 640
(%)	(88.7)	(4.1)	(0.1)	(0.5)	(0.3)	(6.2)	(100.0)
5~	27 824	1 293	18	190	60	1 462	30 847
(%)	(90.2)	(4.2)	(0.1)	(0.6)	(0.2)	(4.7)	(100.0)
6~	60 916	3 086	45	498	56	1847	66 448
(%)	(91.7)	(4.6)	(0.1)	(0.7)	(0.1)	(2.8)	(100.0)
7~	68 860	3 747	39	562	27	1316	74 551
(%)	(92.4)	(5.0)	(0.1)	(0.8)	(0.0)	(1.8)	(100.0)
8~	43 602	2 467	30	350	12	565	47 026
(%)	(92.7)	(5.2)	(0.1)	(0.7)	(0.0)	(1.2)	(100.0)
9~	17 630	1 032	17	125	2	232	19 038
(%)	(92.6)	(5.4)	(0.1)	(0.7)	(0.0)	(1.2)	(100.0)
10~	7 674	443	4	43		99	8 263
(%)	(92.9)	(5.4)	(0.0)	(0.5)		(1.2)	(100.0)
Subtotal	236 417	12 504	160	1818	214	6182	257 295
(%)	(91.9)	(4.9)	(0.1)	(0.7)	(0.1)	(2.4)	(100.0)
No information available	33 655	1 611	7	147	108	2912	38 440
(%)	(87.6)	(4.2)	(0.0)	(0.4)	(0.3)	(7.6)	(100.0)
Total	270 072	14 115	167	1965	322	9094	295 735
(%)	(91.3)	(4.8)	(0.1)	(0.7)	(0.1)	(3.1)	(100.0)
Mean	7.26	7.37	7.31	7.30	5.69	6.56	7.25
S.D.	1.40	1.38	1.41	1.28	1.49	1.42	1.41

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

Normalized protein catabolic rate (nPCR) and serum uric acid level

Table 25 shows the number of patients and their nPCRs and predialysis serum uric acid levels who had undergone HD at facilities three times per week for 2 years or more as of the end of 2011. Here, nPCR is an indicator derived from the urea kinetic model. For patients with stable protein utilization, nPCR nearly agrees with protein intake.

Normalized protein catabolic rate was calculated from predialysis and postdialysis BUN levels and weights using the equation proposed by Shinzato et al. (7) This calculation method cannot be used for patients with remaining renal function. Therefore, this tabulation targeted only patients on dialysis for 2 years or more, whose renal function was considered to be almost lost.

The result indicates that the higher the nPCR, the higher the predialysis serum uric acid level. This suggests that protein intake may affect the serum uric acid level.

Kt/V for urea and serum uric acid level

Table 26 shows the number of patients and their Kt/V for urea and predialysis serum uric acid levels who had undergone HD at facilities three times per week for 2 years or more as of the end of 2011. Here, Kt/V for urea is an indicator derived from the urea kinetic model.

Kt/V for urea was assumed on the basis of the single pool model Kt/V for urea (Kt/Vsp) calculated using the equation proposed by Shinzato et al. (7) Kt/Vsp proposed by Shinzato almost agrees with that proposed by Daugirdas et al. (8), which is used worldwide. The effect of Kt/Vsp on the predialysis serum uric acid level in patients with remaining renal function was considered to be different from that in patients without renal function. Therefore, this tabulation targeted only patients on dialysis for 2 years or more, whose renal function was considered to be almost lost.

The mean predialysis serum uric acid level was lower among patients with Kt/Vsp of <1.0 than among those with Kt/Vsp of ≥1.0. However, patients with Kt/Vsp of <0.4 showed a higher mean predialysis serum uric acid level. There was no clear relationship between Kt/Vsp and the predialysis serum uric acid level for patients with Kt/Vsp of ≥1.0. This result suggests that the increase in dialysis dose for low-molecular-weight substances does not very strongly affect the predialysis serum uric acid level.

Items associated with lipids

Serum total cholesterol level

Table 27 shows the number of patients and their serum total cholesterol levels. Serum total cholesterol level is used as an index of protein-energy wasting

TABLE 21. *Current status of use of anti-hyperuricemic drugs for different predialysis serum uric acid levels (mg/dL) (for patients who underwent HD at facilities three times per week)*

Use of anti-hyperuricemic drugs	<3	3~	4~	5~	6~	7~	8~	9~	10~	Subtotal	No information available	Total	Mean	S.D.
None	312	921	4065	16 678	41 328	50 566	32 857	13 500	5714	165 941	4 639	170 580	7.37	1.37
(%)	(0.2)	(0.6)	(2.4)	(10.1)	(24.9)	(30.5)	(19.8)	(8.1)	(3.4)	(100.0)				
Allopurinol	97	350	1968	6 350	9722	7 832	3 936	1 347	621	32 223	412	32 635	6.78	1.37
(%)	(0.3)	(1.1)	(6.1)	(19.7)	(30.2)	(24.3)	(12.2)	(4.2)	(1.9)	(100.0)				
Febuxostat	26	103	203	283	219	146	82	28	20	1 110	4	1 114	5.90	1.72
(%)	(2.3)	(9.3)	(18.3)	(25.5)	(19.7)	(13.2)	(7.4)	(2.5)	(1.8)	(100.0)				
Benzbromarone		2	2	7	14	29	15	11	1	81	2	83	7.40	1.36
(%)		(2.5)	(2.5)	(8.6)	(17.3)	(35.8)	(18.5)	(13.6)	(1.2)	(100.0)				
K/Na citrate		1	1	5	13	14	6	2	2	44	1	45	7.12	1.31
(%)		(2.3)	(2.3)	(11.4)	(29.5)	(31.8)	(13.6)	(4.5)	(4.5)	(100.0)				
Others	2	11	57	173	216	169	102	29	12	771	11	782	6.69	1.38
(%)	(0.3)	(1.4)	(7.4)	(22.4)	(28.0)	(21.9)	(13.2)	(3.8)	(1.6)	(100.0)				
Subtotal	437	1388	6296	23 496	51 512	58 756	36 998	14 917	6 370	200 170	5 069	205 239	7.27	1.39
(%)	(0.2)	(0.7)	(3.1)	(11.7)	(25.7)	(29.4)	(18.5)	(7.5)	(3.2)	(100.0)				
Unspecified	10	10	105	328	680	705	455	168	73	2 534	147	2 681	7.18	1.45
(%)	(0.4)	(0.4)	(4.1)	(12.9)	(26.8)	(27.8)	(18.0)	(6.6)	(2.9)	(100.0)				
No information available	53	163	714	2 474	5 603	6 114	4 012	1 564	688	21 385	6 857	28 242	7.25	1.40
(%)	(0.2)	(0.8)	(3.3)	(11.6)	(26.2)	(28.6)	(18.8)	(7.3)	(3.2)	(100.0)				
Total	500	1561	7115	26 298	57 795	65 575	41 465	16 649	7131	224 089	12 073	236 162	7.26	1.39
(%)	(0.2)	(0.7)	(3.2)	(11.7)	(25.8)	(29.3)	(18.5)	(7.4)	(3.2)	(100.0)				

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

TABLE 22. *History of gouty attacks for different predialysis serum uric acid levels (mg/dL) (for patients who underwent HD at facilities three times per week)*

History of gouty attacks	<3	3~	4~	5~	6~	7~	8~	9~	10~	Subtotal	No information available	Total	Mean	S.D.
None	394	1210	5524	20 736	46 321	53 031	33 430	13 435	5684	179 765	3 978	183 743	7.27	1.39
(%)	(96.3)	(95.7)	(95.6)	(95.7)	(96.4)	(96.4)	(96.1)	(95.6)	(95.0)	(96.1)	(97.4)	(96.1)		
One or more	15	55	256	942	1 745	2 007	1 364	625	299	7 308	108	7 416	7.30	1.48
(%)	(3.7)	(4.3)	(4.4)	(4.3)	(3.6)	(3.6)	(3.9)	(4.4)	(5.0)	(3.9)	(2.6)	(3.9)		
Subtotal	409	1265	5780	21 678	48 066	55 038	34 794	14 060	5983	187 073	4 086	191 159	7.27	1.39
(%)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)		
Unspecified	22	97	398	1 335	2 538	2 830	1 778	680	309	9 987	381	10 368	7.18	1.44
No information available	69	199	937	3 285	7 191	7 707	4 893	1 909	839	27 029	7 606	34 635	7.22	1.40
Total	500	1561	7115	26 298	57 795	65 575	41 465	16 649	7131	224 089	12 073	236 162	7.26	1.39

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

TABLE 23. *Predialysis serum uric acid levels (mg/dL) for different predialysis serum albumin levels (g/dL) (for patients who underwent HD at facilities three times per week)*

Predialysis serum uric acid level (mg/dL)	<1.5	1.5~	2.0~	2.5~	3.0~	3.5~	4.0~	4.5~	5.0~	Subtotal	No information available	Total	Mean	S.D.
<3	4	9	35	64	118	181	71	6	1	489	11	500	3.38	0.65
(%)	(0.8)	(1.8)	(7.2)	(13.1)	(24.1)	(37.0)	(14.5)	(1.2)	(0.2)	(100.0)				
3~	9	46	160	312	430	400	131	14	3	1 505	56	1 561	3.17	0.65
(%)	(0.6)	(3.1)	(10.6)	(20.7)	(28.6)	(26.6)	(8.7)	(0.9)	(0.2)	(100.0)				
4~	15	117	459	1020	1 967	2 411	825	54	14	6 882	233	7 115	3.34	0.60
(%)	(0.2)	(1.7)	(6.7)	(14.8)	(28.6)	(35.0)	(12.0)	(0.8)	(0.2)	(100.0)				
5~	18	162	624	2174	6 452	11 533	4 348	225	40	25 576	722	26 298	3.53	0.49
(%)	(0.1)	(0.6)	(2.4)	(8.5)	(25.2)	(45.1)	(17.0)	(0.9)	(0.2)	(100.0)				
6~	20	112	561	2584	12 461	28 315	11 619	682	69	56 423	1 372	57 795	3.64	0.43
(%)	(0.0)	(0.2)	(1.0)	(4.6)	(22.1)	(50.2)	(20.6)	(1.2)	(0.1)	(100.0)				
7~	18	71	341	1920	12 230	33 557	14 909	935	89	64 070	1 505	65 575	3.70	0.39
(%)	(0.0)	(0.1)	(0.5)	(3.0)	(19.1)	(52.4)	(23.3)	(1.5)	(0.1)	(100.0)				
8~	10	28	167	882	6 806	21 329	10 646	651	66	40 585	880	41 465	3.74	0.38
(%)	(0.0)	(0.1)	(0.4)	(2.2)	(16.8)	(52.6)	(26.2)	(1.6)	(0.2)	(100.0)				
9~	3	13	65	356	2 528	8 433	4 547	331	33	16 309	340	16 649	3.76	0.39
(%)	(0.0)	(0.1)	(0.4)	(2.2)	(15.5)	(51.7)	(27.9)	(2.0)	(0.2)	(100.0)				
10~	4	13	47	172	996	3 400	2 123	185	19	6 959	172	7 131	3.77	0.42
(%)	(0.1)	(0.2)	(0.7)	(2.5)	(14.3)	(48.9)	(30.5)	(2.7)	(0.3)	(100.0)				
Subtotal	101	571	2459	9484	43 988	109 559	49 219	3083	334	218 798	5 291	224 089	3.66	0.44
(%)	(0.0)	(0.3)	(1.1)	(4.3)	(20.1)	(50.1)	(22.5)	(1.4)	(0.2)	(100.0)				
No information available	7	40	138	321	1 099	2 622	1 199	82	10	5 518	6 555	12 073	3.62	0.51
(%)	(0.1)	(0.7)	(2.5)	(5.8)	(19.9)	(47.5)	(21.7)	(1.5)	(0.2)	(100.0)				
Total	108	611	2597	9805	45 087	112 181	50 418	3165	344	224 316	11 846	236 162	3.66	0.44
(%)	(0.0)	(0.3)	(1.2)	(4.4)	(20.1)	(50.0)	(22.5)	(1.4)	(0.2)	(100.0)				
Mean	6.24	5.85	6.02	6.47	7.03	7.34	7.51	7.63	7.42	7.27	7.14	7.26		
S.D.	2.07	1.68	1.69	1.52	1.38	1.33	1.36	1.42	1.66	1.39	1.44	1.39		

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

TABLE 24. *Predialysis serum uric acid levels (mg/dL) for different BMIs (kg/m^2) (for patients who underwent HD at facilities three times per week)*

Predialysis serum uric acid level (mg/dL)	<14	14~	16~	18~	20~	22~	24~	26~	28~	30~	Subtotal	No information available	Total	Mean	S.D.
<3	8	27	71	121	82	67	27	19	9	4	435	65	500	20.32	3.63
(%)	(1.8)	(6.2)	(16.3)	(27.8)	(18.9)	(15.4)	(6.2)	(4.4)	(2.1)	(0.9)	(100.0)				
3~	45	128	247	310	258	171	76	34	18	6	1 293	268	1 561	19.93	9.15
(%)	(3.5)	(9.9)	(19.1)	(24.0)	(20.0)	(13.2)	(5.9)	(2.6)	(1.4)	(0.5)	(100.0)				
4~	120	510	1 144	1 487	1 265	841	408	176	65	57	6 073	1 042	7 115	20.02	3.80
(%)	(2.0)	(8.4)	(18.8)	(24.5)	(20.8)	(13.8)	(6.7)	(2.9)	(1.1)	(0.9)	(100.0)				
5~	257	1255	3 555	5 621	5 456	3 672	1 843	836	371	293	23 159	3 139	26 298	20.62	3.65
(%)	(1.1)	(5.4)	(15.4)	(24.3)	(23.6)	(15.9)	(8.0)	(3.6)	(1.6)	(1.3)	(100.0)				
6~	344	2016	6 684	12 154	12 504	8 972	4 830	2 301	1067	971	51 843	5 952	57 795	21.11	4.00
(%)	(0.7)	(3.9)	(12.9)	(23.4)	(24.1)	(17.3)	(9.3)	(4.4)	(2.1)	(1.9)	(100.0)				
7~	294	1862	6 943	13 003	14 079	10 939	6 217	3 036	1573	1376	59 322	6 253	65 575	21.46	3.95
(%)	(0.5)	(3.1)	(11.7)	(21.9)	(23.7)	(18.4)	(10.5)	(5.1)	(2.7)	(2.3)	(100.0)				
8~	163	1022	3 979	7 671	8 800	7 105	4 270	2 289	1131	1271	37 701	3 764	41 465	21.83	4.30
(%)	(0.4)	(2.7)	(10.6)	(20.3)	(23.3)	(18.8)	(11.3)	(6.1)	(3.0)	(3.4)	(100.0)				
9~	66	392	1 444	2 694	3 447	2 921	1 885	1 133	508	633	15 123	1 526	16 649	22.20	4.23
(%)	(0.4)	(2.6)	(9.5)	(17.8)	(22.8)	(19.3)	(12.5)	(7.5)	(3.4)	(4.2)	(100.0)				
10~	27	146	499	1 120	1 324	1 272	846	571	314	400	6 519	612	7 131	22.74	4.36
(%)	(0.4)	(2.2)	(7.7)	(17.2)	(20.3)	(19.5)	(13.0)	(8.8)	(4.8)	(6.1)	(100.0)				
Subtotal	1324	7358	24 566	44 181	47 215	35 960	20 402	10 395	5056	5011	201 468	22 621	224 089	21.38	4.12
(%)	(0.7)	(3.7)	(12.2)	(21.9)	(23.4)	(17.8)	(10.1)	(5.2)	(2.5)	(2.5)	(100.0)				
No information available	41	225	645	1 212	1 146	961	546	277	149	108	5 310	6 763	12 073	21.31	4.18
(%)	(0.8)	(4.2)	(12.1)	(22.8)	(21.6)	(18.1)	(10.3)	(5.2)	(2.8)	(2.0)	(100.0)				
Total	1365	7583	25 211	45 393	48 361	36 921	20 948	10 672	5205	5119	206 778	29 384	236 162	21.38	4.12
(%)	(0.7)	(3.7)	(12.2)	(22.0)	(23.4)	(17.9)	(10.1)	(5.2)	(2.5)	(2.5)	(100.0)				
Mean	6.66	6.85	7.04	7.16	7.27	7.38	7.48	7.62	7.67	7.87	7.28	7.10	7.26		
S.D.	1.59	1.47	1.38	1.36	1.35	1.36	1.37	1.42	1.43	1.44	1.39	1.45	1.39		

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

TABLE 25. *Predialysis serum uric acid levels (mg/dL) for different nPCRs (g/kg/day) (for patients who had undergone HD at facilities three times per week for two years or more)*

Predialysis serum uric acid level (mg/dL)	<0.4	0.4~	0.6~	0.8~	1.0~	1.2~	1.4~	1.6~	1.8~	2.0~	Subtotal	No information available	Total	Mean	S.D.
<3	10	49	93	89	39	11					291	78	369	0.78	0.23
(%)	(3.4)	(16.8)	(32.0)	(30.6)	(13.4)	(3.8)					(100.0)				
3~	54	258	353	259	88	13		2			1 027	109	1 136	0.72	0.21
(%)	(5.3)	(25.1)	(34.4)	(25.2)	(8.6)	(1.3)		(0.2)			(100.0)				
4~	66	1028	2 135	1 263	356	80	9	1			4 938	414	5 352	0.74	0.19
(%)	(1.3)	(20.8)	(43.2)	(25.6)	(7.2)	(1.6)	(0.2)	(0.0)			(100.0)				
5~	83	2215	8 220	6 562	1 661	248	26	2	2	3	19 022	1 212	20 234	0.78	0.17
(%)	(0.4)	(11.6)	(43.2)	(34.5)	(8.7)	(1.3)	(0.1)	(0.0)	(0.0)	(0.0)	(100.0)				
6~	103	2244	15 879	18 623	5 724	742	67	12	1	8	43 403	2 112	45 515	0.83	0.16
(%)	(0.2)	(5.2)	(36.6)	(42.9)	(13.2)	(1.7)	(0.2)	(0.0)	(0.0)	(0.0)	(100.0)				
7~	122	1334	12 842	23 951	9 977	1448	145	19	8	14	49 860	2 160	52 020	0.89	0.16
(%)	(0.2)	(2.7)	(25.8)	(48.0)	(20.0)	(2.9)	(0.3)	(0.0)	(0.0)	(0.0)	(100.0)				
8~	80	435	5 679	14 871	8 781	1776	170	25	5	6	31 828	1 233	33 061	0.93	0.17
(%)	(0.3)	(1.4)	(17.8)	(46.7)	(27.6)	(5.6)	(0.5)	(0.1)	(0.0)	(0.0)	(100.0)				
9~	29	131	1 612	5 292	4 338	1098	146	10	2	4	12 662	477	13 139	0.98	0.18
(%)	(0.2)	(1.0)	(12.7)	(41.8)	(34.3)	(8.7)	(1.2)	(0.1)	(0.0)	(0.0)	(100.0)				
10~	13	54	495	1 867	1 953	708	147	30			5 267	180	5 447	1.02	0.19
(%)	(0.2)	(1.0)	(9.4)	(35.4)	(37.1)	(13.4)	(2.8)	(0.6)			(100.0)				
Subtotal	560	7748	47 308	72 777	32 917	6124	710	101	18	35	168 298	7 975	176 273	0.88	0.18
(%)	(0.3)	(4.6)	(28.1)	(43.2)	(19.6)	(3.6)	(0.4)	(0.1)	(0.0)	(0.0)	(100.0)				
No information available	7	207	1 365	2 041	894	139	16	2		4	4 675	4 410	9 085	0.87	0.18
(%)	(0.1)	(4.4)	(29.2)	(43.7)	(19.1)	(3.0)	(0.3)	(0.0)		(0.1)	(100.0)				
Total	567	7955	48 673	74 818	33 811	6263	726	103	18	39	172 973	12 385	185 358	0.88	0.18
(%)	(0.3)	(4.6)	(28.1)	(43.3)	(19.5)	(3.6)	(0.4)	(0.1)	(0.0)	(0.0)	(100.0)				
Mean	6.45	6.13	6.81	7.38	7.85	8.24	8.65	8.72	7.64	7.47	7.29	6.97	7.27		
S.D.	1.86	1.32	1.23	1.26	1.34	1.50	1.72	2.04	1.14	1.15	1.37	1.50	1.38		

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

TABLE 26. *Predialysis serum uric acid levels (mg/dL) for different values of Kt/Vsp for (for patients who had undergone HD at facilities three times per week for two years or more)*

Predialysis serum uric acid level (mg/dL)	<0.4	0.4~	0.6~	0.8~	1.0~	1.2~	1.4~	1.6~	1.8~	2.0~	Subtotal	No information available	Total	Mean	S.D.
<3	3	2	7	16	46	69	74	47	15	11	290	79	369	1.39	0.33
(%)	(1.0)	(0.7)	(2.4)	(5.5)	(15.9)	(23.8)	(25.5)	(16.2)	(5.2)	(3.8)	(100.0)				
3~	6	10	19	83	176	253	217	155	71	35	1 025	111	1 136	1.38	0.35
(%)	(0.6)	(1.0)	(1.9)	(8.1)	(17.2)	(24.7)	(21.2)	(15.1)	(6.9)	(3.4)	(100.0)				
4~	8	21	67	237	758	1 271	1 202	806	340	222	4 932	420	5 352	1.43	0.32
(%)	(0.2)	(0.4)	(1.4)	(4.8)	(15.4)	(25.8)	(24.4)	(16.3)	(6.9)	(4.5)	(100.0)				
5~	34	33	133	739	2 578	5 030	5 103	3 091	1 418	829	18 988	1 246	20 234	1.45	0.30
(%)	(0.2)	(0.2)	(0.7)	(3.9)	(13.6)	(26.5)	(26.9)	(16.3)	(7.5)	(4.4)	(100.0)				
6~	85	73	230	1393	5 446	11 437	11 925	7 394	3 329	2022	43 334	2 181	45 515	1.46	0.30
(%)	(0.2)	(0.2)	(0.5)	(3.2)	(12.6)	(26.4)	(27.5)	(17.1)	(7.7)	(4.7)	(100.0)				
7~	158	98	250	1479	5 971	13 022	13 645	8 767	3 931	2463	49 784	2 236	52 020	1.47	0.31
(%)	(0.3)	(0.2)	(0.5)	(3.0)	(12.0)	(26.2)	(27.4)	(17.6)	(7.9)	(4.9)	(100.0)				
8~	96	49	133	965	3 775	8 465	8 453	5 616	2 654	1571	31 777	1 284	33 061	1.47	0.30
(%)	(0.3)	(0.2)	(0.4)	(3.0)	(11.9)	(26.6)	(26.6)	(17.7)	(8.4)	(4.9)	(100.0)				
9~	42	27	63	408	1 598	3 412	3 389	2 127	980	590	12 636	503	13 139	1.46	0.30
(%)	(0.3)	(0.2)	(0.5)	(3.2)	(12.6)	(27.0)	(26.8)	(16.8)	(7.8)	(4.7)	(100.0)				
10~	22	11	26	191	776	1 473	1 396	804	348	216	5 263	184	5 447	1.43	0.30
(%)	(0.4)	(0.2)	(0.5)	(3.6)	(14.7)	(28.0)	(26.5)	(15.3)	(6.6)	(4.1)	(100.0)				
Subtotal	454	324	928	5511	21 124	44 432	45 404	28 807	13 086	7959	168 029	8 244	176 273	1.46	0.30
(%)	(0.3)	(0.2)	(0.6)	(3.3)	(12.6)	(26.4)	(27.0)	(17.1)	(7.8)	(4.7)	(100.0)				
No information available		2	33	172	647	1 279	1 190	760	334	252	4 669	4 416	9 085	1.46	0.31
(%)		(0.0)	(0.7)	(3.7)	(13.9)	(27.4)	(25.5)	(16.3)	(7.2)	(5.4)	(100.0)				
Total	454	326	961	5683	21 771	45 711	46 594	29 567	13 420	8211	172 698	12 660	185 358	1.46	0.30
(%)	(0.3)	(0.2)	(0.6)	(3.3)	(12.6)	(26.5)	(27.0)	(17.1)	(7.8)	(4.8)	(100.0)				
Mean	7.53	7.12	6.95	7.16	7.25	7.30	7.29	7.30	7.31	7.32	7.29	6.98	7.27		
S.D.	1.44	1.67	1.57	1.48	1.44	1.37	1.35	1.34	1.32	1.33	1.37	1.50	1.38		

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

TABLE 27. *Serum total cholesterol levels (mg/dL) for both genders (for all dialysis patients)*

Serum total cholesterol level (mg/dL)	Male	Female	Subtotal	No information available	Total
<100	6 291	1 415	7 706		7 706
(%)	(4.5)	(1.7)	(3.5)		(3.5)
100~	17 893	4 642	22 535		22 535
(%)	(12.9)	(5.6)	(10.2)		(10.2)
120~	31 370	11 313	42 683		42 683
(%)	(22.6)	(13.7)	(19.3)		(19.3)
140~	33 720	17 192	50 912		50 912
(%)	(24.3)	(20.8)	(23.0)		(23.0)
160~	24 953	18 116	43 069		43 069
(%)	(18.0)	(22.0)	(19.5)		(19.5)
180~	14 018	14 099	28 117	1	28 118
(%)	(10.1)	(17.1)	(12.7)	(100.0)	(12.7)
200~	6 509	8 441	14 950		14 950
(%)	(4.7)	(10.2)	(6.8)		(6.8)
220~	2 684	4 271	6 955		6 955
(%)	(1.9)	(5.2)	(3.1)		(3.1)
240~	909	1 784	2 693		2 693
(%)	(0.7)	(2.2)	(1.2)		(1.2)
260~	602	1 185	1 787		1 787
(%)	(0.4)	(1.4)	(0.8)		(0.8)
Subtotal	138 949	82 458	221 407	1	221 408
(%)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)
No information available	46 210	28 117	74 327		74 327
Total	185 159	110 575	295 734	1	295 735
Mean	150.16	168.99	157.17	184.00	157.17
S.D.	33.40	36.65	35.82		35.82

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

(PEW). The percentage of patients with a serum total cholesterol level of <100 mg/dL among patients who responded to questions regarding the serum total cholesterol level was 3.5%. The percentage of such patients was higher among males (4.5%) than among females (1.7%) (Table 27).

As shown in Table 28, the number of patients aged <15 years was very small (58 patients) and the number of such patients with a serum total cholesterol level <100 mg/dL was one (1.7%). Excluding the patients aged <15 years, the percentage of patients with a serum total cholesterol level of <100 mg/dL was the lowest among patients aged 30–44 years (2.3%). The percentages of patients younger and older than this age group were higher (15–29 years old, 3.9%; 30–44 years old, 2.3%; 45–59 years old, 2.8%; 60–74 years old, 3.5%; 75–89 years old, 4.2%; ≥90 years, 3.4%). Particularly for the patients aged 45–89 years, the percentage of patients with a serum total cholesterol level of <100 mg/dL increased with age. However, the percentage of patients with a serum total cholesterol level of <100 mg/dL was lower among patients aged ≥90 years than among those aged 75–89 years.

As shown in Table 29, the percentage of patients with a serum total cholesterol level of <100 mg/dL was small among patients on dialysis for 20–24 years (<2 years, 3.6%; 2–4 years, 3.4%; 5–9 years, 3.8%; 10–14 years, 3.5%; 15–19 years, 2.8%; 20–24 years, 2.5%; ≥25 years, 2.9%).

As shown in Table 30, the percentage of patients with a serum total cholesterol level of <100 mg/dL among patients with diabetic nephropathy as the primary disease was 4.6%. This was higher than the percentages of patients with a serum total cholesterol level of <100 mg/dL and other primary diseases (2.9%).

Serum HDL cholesterol level

Table 31 shows the number of patients with or without myocardial infarction and their serum HDL cholesterol levels among all dialysis patients. For blood purification methods other than PD, predialysis serum HDL cholesterol levels were surveyed. The percentage of patients with a serum HDL cholesterol level of <40 mg/dL, at which patients are diagnosed as having hypo-HDL cholesterolemia, was 32.6%. The relationship between serum HDL cholesterol level and history of myocardial infarction is described later.

TABLE 28. *Serum total cholesterol levels (mg/dL) for various age groups (for all dialysis patients)*

Serum total cholesterol level (mg/dL)	<15 years old	15 years old ~	30 years old ~	45 years old ~	60 years old ~	75 years old ~	90 years old ~	Subtotal	No information available	Total	Mean	S.D.
<100	1	37	270	1 227	3 575	2 496	100	7 706		7 706	68.40	11.94
(%)	(1.7)	(3.9)	(2.3)	(2.8)	(3.5)	(4.2)	(3.4)	(3.5)		(3.5)		
100~		124	968	3 809	10 492	6 812	329	22 534	1	22 535	67.76	12.26
(%)		(13.2)	(8.1)	(8.7)	(10.3)	(11.4)	(11.2)	(10.2)	(50.0)	(10.2)		
120~	3	219	2 072	7 476	19 674	12 547	691	42 682	1	42 683	67.43	12.48
(%)	(5.2)	(23.2)	(17.4)	(17.1)	(19.2)	(21.0)	(23.6)	(19.3)	(50.0)	(19.3)		
140~	8	200	2 801	9 615	23 181	14 393	714	50 912		50 912	66.88	12.57
(%)	(13.8)	(21.2)	(23.5)	(22.0)	(22.7)	(24.1)	(24.4)	(23.0)		(23.0)		
160~	7	160	2 471	8 758	19 918	11 210	545	43 069		43 069	66.20	12.49
(%)	(12.1)	(17.0)	(20.8)	(20.0)	(19.5)	(18.8)	(18.6)	(19.5)		(19.5)		
180~	5	113	1 650	6 363	13 006	6 665	316	28 118		28 118	65.30	12.49
(%)	(8.6)	(12.0)	(13.9)	(14.5)	(12.7)	(11.2)	(10.8)	(12.7)		(12.7)		
200~	14	46	930	3 595	6 970	3 265	130	14 950		14 950	64.71	12.35
(%)	(24.1)	(4.9)	(7.8)	(8.2)	(6.8)	(5.5)	(4.4)	(6.8)		(6.8)		
220~	6	21	430	1 764	3 285	1 381	68	6 955		6 955	64.22	12.21
(%)	(10.3)	(2.2)	(3.6)	(4.0)	(3.2)	(2.3)	(2.3)	(3.1)		(3.1)		
240~	9	13	170	670	1 281	527	23	2 693		2 693	63.90	12.61
(%)	(15.5)	(1.4)	(1.4)	(1.5)	(1.3)	(0.9)	(0.8)	(1.2)		(1.2)		
260~	5	9	138	470	828	324	13	1 787		1 787	63.16	12.92
(%)	(8.6)	(1.0)	(1.2)	(1.1)	(0.8)	(0.5)	(0.4)	(0.8)		(0.8)		
Subtotal	58	942	11 900	43 747	102 210	59 620	2929	221 406	2	221 408	66.50	12.50
(%)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)		
No information available	41	363	4 071	14 453	33 529	20 761	1107	74 325	2	74 327	66.70	12.74
Total	99	1305	15 971	58 200	135 739	80 381	4036	295 731	4	295 735	66.55	12.56
Mean	204.16	152.94	161.51	161.75	157.31	153.00	151.82	157.17	126.50	157.17		
S.D.	51.19	35.96	35.98	36.69	35.98	34.39	32.92	35.82	12.02	35.82		

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

TABLE 29. *Serum total cholesterol levels (mg/dL) for different periods on dialysis (for all dialysis patients)*

Serum total cholesterol level (mg/dL)	<2 years	2 years ~	5 years ~	10 years ~	15 years ~	20 years ~	25 years ~	Subtotal	Mean	S.D.
<100	1 730	1 902	2 175	1 012	415	203	269	7 706	6.78	6.90
(%)	(3.6)	(3.4)	(3.8)	(3.5)	(2.8)	(2.5)	(2.9)	(3.5)		
100~	4 871	5 824	6 143	2 880	1 329	602	886	22 535	6.94	7.10
(%)	(10.2)	(10.4)	(10.8)	(10.0)	(8.9)	(7.4)	(9.7)	(10.2)		
120~	9 292	11 064	11 171	5 385	2 708	1 412	1 651	42 683	7.03	7.20
(%)	(19.5)	(19.7)	(19.7)	(18.8)	(18.2)	(17.4)	(18.0)	(19.3)		
140~	10 966	13 002	13 130	6 525	3 378	1 843	2 068	50 912	7.19	7.29
(%)	(23.0)	(23.2)	(23.1)	(22.7)	(22.7)	(22.7)	(22.6)	(23.0)		
160~	9 081	10 905	10 965	5 591	2 969	1 703	1 855	43 069	7.37	7.41
(%)	(19.0)	(19.4)	(19.3)	(19.5)	(20.0)	(21.0)	(20.3)	(19.5)		
180~	5 819	7 057	6 927	3 790	2 121	1 192	1 212	28 118	7.54	7.51
(%)	(12.2)	(12.6)	(12.2)	(13.2)	(14.3)	(14.7)	(13.2)	(12.7)		
200~	3 173	3 610	3 637	1 996	1 141	697	696	14 950	7.67	7.63
(%)	(6.7)	(6.4)	(6.4)	(7.0)	(7.7)	(8.6)	(7.6)	(6.8)		
220~	1 531	1 690	1 641	987	480	294	332	6 955	7.58	7.66
(%)	(3.2)	(3.0)	(2.9)	(3.4)	(3.2)	(3.6)	(3.6)	(3.1)		
240~	681	663	594	334	192	113	116	2 693	7.13	7.50
(%)	(1.4)	(1.2)	(1.0)	(1.2)	(1.3)	(1.4)	(1.3)	(1.2)		
260~	544	419	376	197	117	67	67	1 787	6.50	7.40
(%)	(1.1)	(0.7)	(0.7)	(0.7)	(0.8)	(0.8)	(0.7)	(0.8)		
Subtotal	47 688	56 136	56 759	28 697	14 850	8 126	9 152	221 408	7.24	7.33
(%)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)		
No information available	18 315	18 937	18 314	8 891	4 684	2 503	2 683	74 327	6.76	7.12
Total	66 003	75 073	75 073	37 588	19 534	10 629	11 835	295 735	7.12	7.28
Mean	157.42	156.61	155.57	157.68	159.73	162.07	159.18	157.17		
S.D.	37.03	35.42	35.31	35.72	35.48	35.11	35.70	35.82		

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

TABLE 30. *Serum total cholesterol levels (mg/dL) for different primary diseases (for all dialysis patients)*

Serum total cholesterol level (mg/dL)	Chronic glomerulo-nephritis	Chronic pyelo-nephritis	Rapidly progressive glomerulo-nephritis	Nephropathy of pregnancy/ pregnancy toxemia	Other nephritides that cannot be classified	Polycystic kidney	Nephro-sclerosis	Malignant hypertension	Diabetic nephropathy	SLE nephritis	Amyloidal kidney	Gouty kidney	Renal failure due to congenital abnormality of metabolism
<100	2 168	46	39	14	28	169	502	39	3 704	29	13	38	8
(%)	(2.8)	(2.0)	(2.4)	(1.0)	(2.9)	(2.2)	(2.8)	(2.3)	(4.6)	(1.6)	(3.6)	(4.1)	(3.8)
100~	6 753	183	81	52	78	676	1 738	141	10 134	98	28	100	15
(%)	(8.7)	(8.0)	(5.0)	(3.9)	(8.2)	(8.7)	(9.8)	(8.2)	(12.5)	(5.6)	(7.8)	(10.8)	(7.1)
120~	13 995	382	208	168	163	1 444	3 420	312	17 234	238	68	189	35
(%)	(18.0)	(16.8)	(12.9)	(12.5)	(17.1)	(18.6)	(19.2)	(18.1)	(21.2)	(13.5)	(18.8)	(20.4)	(16.6)
140~	17 796	481	335	267	240	1 862	4 351	415	18 586	337	61	227	53
(%)	(22.9)	(21.1)	(20.8)	(19.9)	(25.2)	(24.0)	(24.4)	(24.1)	(22.9)	(19.1)	(16.9)	(24.5)	(25.1)
160~	15 928	487	335	312	178	1 651	3 612	343	14 595	383	74	151	39
(%)	(20.5)	(21.4)	(20.8)	(23.2)	(18.7)	(21.3)	(20.3)	(19.9)	(18.0)	(21.7)	(20.5)	(16.3)	(18.5)
180~	10 717	354	271	265	131	1 086	2 260	235	8 731	309	57	128	37
(%)	(13.8)	(15.5)	(16.9)	(19.7)	(13.8)	(14.0)	(12.7)	(13.6)	(10.8)	(17.5)	(15.8)	(13.8)	(17.5)
200~	5 886	200	173	133	69	537	1 151	126	4 553	167	30	58	12
(%)	(7.6)	(8.8)	(10.8)	(9.9)	(7.2)	(6.9)	(6.5)	(7.3)	(5.6)	(9.5)	(8.3)	(6.3)	(5.7)
220~	2 679	85	87	82	42	227	477	71	2 150	116	15	24	8
(%)	(3.5)	(3.7)	(5.4)	(6.1)	(4.4)	(2.9)	(2.7)	(4.1)	(2.7)	(6.6)	(4.2)	(2.6)	(3.8)
240~	1 024	36	46	30	16	71	194	25	832	50	4	6	2
(%)	(1.3)	(1.6)	(2.9)	(2.2)	(1.7)	(0.9)	(1.1)	(1.5)	(1.0)	(2.8)	(1.1)	(0.6)	(0.9)
260~	619	26	32	21	7	45	120	17	601	37	11	5	2
(%)	(0.8)	(1.1)	(2.0)	(1.6)	(0.7)	(0.6)	(0.7)	(1.0)	(0.7)	(2.1)	(3.0)	(0.5)	(0.9)
Subtotal	77 565	2280	1607	1344	952	7 768	17 825	1724	81 120	1764	361	926	211
(%)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)
No information available	25 194	706	562	391	348	2 329	5 470	619	27 340	623	132	249	80
Total	102 759	2986	2169	1735	1300	10 097	23 295	2343	108 460	2387	493	1175	291
Mean	159.93	163.48	170.55	172.41	160.99	158.88	157.12	161.08	152.76	171.47	164.16	153.92	160.34
S.D.	35.44	35.95	38.34	34.77	36.19	33.80	34.22	36.07	35.77	38.66	41.33	34.56	35.39

TABLE 30. (continued) *Serum total cholesterol levels (mg/dL) for different primary diseases (for all dialysis patients)*

Serum total cholesterol level (mg/dL)	Kidney and urinary tract tuberculosis	Kidney and urinary tract stone	Kidney and urinary tract tumor	Obstructive urinary tract desease	Myeloma	Hypoplastic kidney	Undetermined	Reintro-duction after trans-plantation	Others	Subtotal	No information available	Total
<100	6	18	30	9	16	12	621	39	158	7 706		7 706
(%)	(2.9)	(4.0)	(4.8)	(1.7)	(9.8)	(2.7)	(3.6)	(2.4)	(3.3)	(3.5)		
100~	15	49	56	44	15	49	1 601	159	470	22 535		22 535
(%)	(7.3)	(11.0)	(8.9)	(8.2)	(9.1)	(11.1)	(9.3)	(9.7)	(9.9)	(10.2)		
120~	34	87	142	84	29	76	3 218	291	866	42 683		42 683
(%)	(16.6)	(19.5)	(22.5)	(15.6)	(17.7)	(17.2)	(18.7)	(17.8)	(18.3)	(19.3)		
140~	51	88	135	116	23	79	3 985	378	1046	5f12		50 912
(%)	(24.9)	(19.7)	(21.4)	(21.6)	(14.0)	(17.9)	(23.2)	(23.1)	(22.1)	(23.0)		
160~	46	86	117	119	25	80	3 293	317	897	43 068	1	43 069
(%)	(22.4)	(19.3)	(18.5)	(22.1)	(15.2)	(18.1)	(19.2)	(19.4)	(19.0)	(19.5)		
180~	27	63	71	86	25	68	2 307	239	650	28 117	1	28 118
(%)	(13.2)	(14.1)	(11.3)	(16.0)	(15.2)	(15.4)	(13.4)	(14.6)	(13.8)	(12.7)		
200~	14	36	39	49	17	38	1 192	115	355	14 950		14 950
(%)	(6.8)	(8.1)	(6.2)	(9.1)	(10.4)	(8.6)	(6.9)	(7.0)	(7.5)	(6.8)		
220~	7	16	26	19	6	19	590	53	156	6 955		6 955
(%)	(3.4)	(3.6)	(4.1)	(3.5)	(3.7)	(4.3)	(3.4)	(3.2)	(3.3)	(3.1)		
240~	2	1	11	9	2	16	223	23	69	2 692	1	2 693
(%)	(1.0)	(0.2)	(1.7)	(1.7)	(1.2)	(3.6)	(1.3)	(1.4)	(1.5)	(1.2)		
260~	3	2	4	3	6	4	143	22	57	1 787		1 787
(%)	(1.5)	(0.4)	(0.6)	(0.6)	(3.7)	(0.9)	(0.8)	(1.3)	(1.2)	(0.8)		
Subtotal	205	446	631	538	164	441	17 173	1636	4724	221 405	3	221 408
(%)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)		
No information available	72	142	186	182	65	149	7 145	526	1778	74 288	39	74 327
Total	277	588	817	720	229	590	24 318	2162	6502	295 693	42	295 735
Mean	160.87	157.21	156.32	163.86	159.85	162.84	158.23	160.31	159.22	157.17	200.67	157.17
S.D.	36.29	35.69	36.98	34.48	48.48	39.63	36.13	36.75	37.52	35.82	35.53	35.82

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

TABLE 31. *Serum HDL cholesterol levels (mg/dL) with or without history of myocardial infarction (for all dialysis patients)*

Myocardial infarction	<20	20~	30~	40~	50~	60~	70~	80~	90~	100~	Subtotal	No information available	Total	Mean	S.D.
None	691	12 343	36 564	41 756	31 027	18 014	8 981	4240	2257	587	156 460	58 094	214 554	48.53	15.88
(%)	(87.6)	(86.9)	(88.9)	(90.9)	(92.1)	(93.5)	(94.4)	(94.6)	(95.3)	(94.1)	(91.0)	(91.0)	(91.0)		
One or more	98	1 868	4 563	4 192	2 653	1 258	529	240	111	37	15 549	5 755	21 304	44.44	14.49
(%)	(12.4)	(13.1)	(11.1)	(9.1)	(7.9)	(6.5)	(5.6)	(5.4)	(4.7)	(5.9)	(9.0)	(9.0)	(9.0)		
Subtotal	789	14 211	41 127	45 948	33 680	19 272	9 510	4480	2368	624	172 009	63 849	235 858	48.16	15.81
(%)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)		
Unspecified	16	214	462	441	317	138	61	27	11	1	1 688	510	2 198	44.56	14.41
No information available	88	1 452	4 219	4 859	3 643	2 145	1 174	539	334	102	18 555	39 124	57 679	49.13	16.49
Total	893	15 877	45 808	51 248	37 640	21 555	10 745	5046	2713	727	192 252	103 483	295 735	48.22	15.87

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

Serum non-HDL cholesterol level

The serum non-HDL cholesterol level is the difference between serum total cholesterol level and serum HDL cholesterol level and indicates the amount of lipoprotein cholesterol that promotes atherosclerosis. Table 32 shows the number of patients with or without myocardial infarction and their serum non-HDL cholesterol levels among all dialysis patients.

The percentage of patients who did not have a serum non-HDL cholesterol level of <150 mg/dL, which is the maximum allowable level for the primary prevention of ischemic heart disease, was 11.7%. The relationship between serum non-HDL cholesterol level and history of myocardial infarction is described later.

Serum HDL cholesterol level, serum non-HDL cholesterol level, and history of myocardial infarction

As shown in Table 31, the percentage of patients with a serum HDL cholesterol level of <40 mg/dL, at which patients are diagnosed as having hypo-HDL cholesterolemia, was higher among patients with a history of myocardial infarction (42.0%) than among patients without a history of myocardial infarction (31.7%).

On the other hand, as shown in Table 32, the percentage of patients with a serum non-HDL cholesterol level of <130 mg/dL, which is the maximum allowable level for the secondary prevention of ischemic heart disease, was higher among patients with a history of myocardial infarction (76.6%) than among patients without a history of myocardial infarction (75.0%).

From the viewpoint of the risk of ischemic heart disease, the trend observed in serum HDL cholesterol level was interpreted as being contradictory to that observed in serum non-HDL cholesterol level.

Here, for all dialysis patients, the serum total cholesterol level was lower among patients with a history of myocardial infarction (152.3 ± 34.9 mg/dL) than among patients without a history of myocardial infarction (157.7 ± 35.9 mg/dL) (mean ± SD, data not shown). This result indicates that the patients with a history of myocardial infarction are more likely to be malnourished than those without a history of myocardial infarction and/or that the patients with a history of myocardial infarction more likely underwent lipid-lowering treatment than the patients without a history of myocardial infarction. These might have caused the patient distributions of serum HDL and non-HDL cholesterol levels to be contradictory from the viewpoint of the risk of ischemic heart disease.

TABLE 32. *Serum non-HDL cholesterol levels (mg/dL) with or without history of myocardial infarction (for all dialysis patients)*

Myocardial infarction	<50	50~	70~	90~	110~	130~	150~	170~	190~	210~	Subtotal	No information available	Total	Mean	S.D.
None	2515	11 770	26 887	33 967	28 526	18 146	9 430	4226	1680	1010	138 157	76 397	214 554	109.15	33.92
(%)	(91.8)	(90.2)	(90.3)	(90.8)	(91.1)	(91.2)	(91.7)	(91.9)	(91.6)	(89.9)	(90.9)	(91.1)	(91.0)		
One or more	225	1 278	2 890	3 437	2 801	1 753	848	374	154	114	13 874	7 430	21 304	107.76	33.55
(%)	(8.2)	(9.8)	(9.7)	(9.2)	(8.9)	(8.8)	(8.3)	(8.1)	(8.4)	(10.1)	(9.1)	(8.9)	(9.0)		
Subtotal	2740	13 048	29 777	37 404	31 327	19 899	10 278	4600	1834	1124	152 031	83 827	235 858	109.03	33.89
(%)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)		
Unspecified	25	115	288	377	294	178	113	58	22	13	1 483	715	2 198	110.70	35.24
No information available	339	1 562	3 303	3 863	3 198	2 014	1 061	489	193	108	16 130	41 549	57 679	107.64	34.19
Total	3104	14 725	33 368	41 644	34 819	22 091	11 452	5147	2049	1245	169 644	126 091	295 735	108.91	33.93

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

Treatment or non-treatment with antihyperlipidemic drugs, serum HDL cholesterol level, and serum non-HDL cholesterol level

Table 33 shows the number of patients treated or not treated with antihyperlipidemic drugs and their serum HDL cholesterol levels and Table 34 shows the number of those patients and their serum non-HDL cholesterol levels. Here, only the treatment and non-treatment with antihyperlipidemic drugs was surveyed, and the type and dose of antihyperlipidemic drug were not surveyed.

Among patients who responded to questions regarding the treatment with antihyperlipidemic drugs, 16.1% were treated with antihyperlipidemic drugs.

The percentages of patients with a serum HDL cholesterol level of <40 mg/dL were 35.0% for patients treated with antihyperlipidemic drugs and 32.2% for patients not treated with antihyperlipidemic drugs.

In contrast, the percentages of patients who did not have a serum non-HDL cholesterol level of <150 mg/dL, which is the maximum allowable level for the primary prevention of ischemic heart disease, were 11.5% for patients treated with antihyperlipidemic drugs and 11.8% for patients not treated with antihyperlipidemic drugs. Note that the history of myocardial infarction was not taken into consideration here.

Current status of dialysate quality control

Among 4213 facilities that responded to the facility survey, 4177 facilities having at least one bedside console responded to questions regarding dialysate. These 4177 facilities are denoted as "the facilities that responded to the questionnaire" below.

Frequency of measurement of endotoxin concentration in dialysate

Among the 4177 facilities that responded to the questionnaire, 4051 facilities (97.0%) responded to questions regarding the frequency of measurement of endotoxin concentration in the dialysate. The response collection rate for these questions was equivalent to that in the previous year (96.5%). As shown in Table 35, the endotoxin concentration in the dialysate was measured at least once a year in 95.8% of the 4051 facilities, remaining almost unchanged from the previous year (95.2%). The facilities that carried out the measurement at least once a month, as recommended by the JSDT guidelines (9), were 71.9% of the 4051 facilities. The percentage of the facilities that carried out the measurement at least once a month has continued to increase since 2009

TABLE 33. *Serum HDL cholesterol levels (mg/dL) with or without treatment with antihyperlipidemic drugs (for all dialysis patients)*

Serum HDL cholesterol level (mg/dL)	Not treated	Treated	Subtotal	Unspecified	No information available	Total
<20	663	145	808	19	66	893
(%)	(82.1)	(17.9)	(100.0)			
20~	11 650	2 684	14 334	272	1 271	15 877
(%)	(81.3)	(18.7)	(100.0)			
30~	33 973	7 413	41 386	665	3 757	45 808
(%)	(82.1)	(17.9)	(100.0)			
40~	38 491	7 678	46 169	680	4 399	51 248
(%)	(83.4)	(16.6)	(100.0)			
50~	28 472	5 349	33 821	522	3 297	37 640
(%)	(84.2)	(15.8)	(100.0)			
60~	16 232	3 145	19 377	256	1 922	21 555
(%)	(83.8)	(16.2)	(100.0)			
70~	7 993	1 574	9 567	136	1 042	10 745
(%)	(83.5)	(16.5)	(100.0)			
80~	3 725	741	4 466	67	513	5 046
(%)	(83.4)	(16.6)	(100.0)			
90~	1 956	433	2 389	28	296	2 713
(%)	(81.9)	(18.1)	(100.0)			
100~	492	118	610	5	112	727
(%)	(80.7)	(19.3)	(100.0)			
Subtotal	143 647	29 280	172 927	2650	16 675	192 252
(%)	(83.1)	(16.9)	(100.0)			
No information available	52 602	8 250	60 852	1054	41 577	103 483
(%)	(86.4)	(13.6)	(100.0)			
Total	196 249	37 530	233 779	3704	58 252	295 735
(%)	(83.9)	(16.1)	(100.0)			
Mean	48.25	47.59	48.13	46.70	49.32	48.22
S.D.	15.74	16.08	15.80	15.48	16.57	15.87

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

(36.0% in 2009 (10) and 70.6% in 2010 (2)). This may be because additional points can be obtained by facilities that maintain the required quality of dialysate upon request from the medical insurance system in Japan; this policy started in 2010.

Endotoxin concentration in dialysate

There were 3862 facilities that responded to questions regarding the endotoxin concentration in the dialysate (92.5% of the 4177 facilities that responded to the questionnaire). The dialysate quality control standard was less than 0.05 EU/mL, as stated in the JSDT guidelines (9), and the percentage of facilities that satisfied this standard was 93.0% (Table 35). This percentage has continued to increase since 2009 (84.2% in 2009 [10] and 91.7% in 2010 [2]).

Frequency of measurement of bacterial count in dialysate

There were 3990 facilities that responded to questions regarding the frequency of measurement of the bacterial count in the dialysate (95.5% of the 4177 facilities that responded to the questionnaire). This response collection rate (95.5%) was equivalent to that in the previous year (94.8%). As shown in Table 36, a bacterial test was carried out at least once a year at 3650 facilities (91.5% of the 3990 facilities). The percentage of facilities that carried out the test at least once a year has continued to increase since 2009 (60.7% in 2009 (10) and 89.2% in 2010 (2)), and this improvement was still observed in the 2011 survey. Among the 3990 facilities, 70.0% carried out the test at least once a month, as recommended by the JSDT guidelines (9). This percentage has also continued to increase since 2009 (25.8% in 2009 (10) and 67.8% in 2010 (2)).

Bacterial count in dialysate

Bacterial counts in the dialysate were reported by 3577 facilities (85.6% of the 4177 facilities that responded to the questionnaire). Among these 3577 facilities, 3515 facilities (98.3%) satisfied the dialysate quality control standard recommended in the JSDT guidelines (9) (i.e. less than 100 cfu/mL), as shown in Table 37. The percentage of facilities that satisfied a bacterial count of less than 0.1 cfu/mL, the standard

TABLE 34. *Serum non-HDL cholesterol levels (mg/dL) with or without treatment with antihyperlipidemic drugs (for all dialysis patients)*

Serum non-HDL cholesterol level (mg/dL)	Not treated	Treated	Subtotal	Unspecified	No information available	Total
<50	2 299	430	2 729	45	330	3 104
(%)	(84.2)	(15.8)	(100.0)			
50~	10 755	2 335	13 090	198	1 437	14 725
(%)	(82.2)	(17.8)	(100.0)			
70~	24 544	5 315	29 859	515	2 994	33 368
(%)	(82.2)	(17.8)	(100.0)			
90~	31 184	6 313	37 497	652	3 495	41 644
(%)	(83.2)	(16.8)	(100.0)			
110~	26 239	5 177	31 416	476	2 927	34 819
(%)	(83.5)	(16.5)	(100.0)			
130~	16 806	3 160	19 966	318	1 807	22 091
(%)	(84.2)	(15.8)	(100.0)			
150~	8 696	1 631	10 327	177	948	11 452
(%)	(84.2)	(15.8)	(100.0)			
170~	3 894	761	4 655	69	423	5 147
(%)	(83.7)	(16.3)	(100.0)			
190~	1 525	312	1 837	40	172	2 049
(%)	(83.0)	(17.0)	(100.0)			
210~	878	246	1 124	20	101	1 245
(%)	(78.1)	(21.9)	(100.0)			
Subtotal	126 820	25 680	152 500	2510	14 634	169 644
(%)	(83.2)	(16.8)	(100.0)			
No information available	69 429	11 850	81 279	1194	43 618	126 091
(%)	(85.4)	(14.6)	(100.0)			
Total	196 249	37 530	233 779	3704	58 252	295 735
(%)	(83.9)	(16.1)	(100.0)			
Mean	109.22	108.30	109.07	108.96	107.27	108.91
S.D.	33.79	34.40	33.89	34.29	34.24	33.93

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

for ultrapure dialysate, was 56.4% (2017 facilities), an increase from the previous year (53.1%) (2).

Media used for cultivation of bacteria in dialysate

According to the JSDT guidelines, oligotrophic media (e.g. Reasoner's no. 2 agar [R2A] and tryptone glucose extract agar [TGEA]) are recommended for the cultivation of bacteria in the dialysate (9). The survey results showed that these media were used by 2958 (84.9%) of the 3486 facilities that responded to questions regarding the media used for the cultivation of bacteria (Table 37).

Volume of sample for measurement of bacterial count in dialysate

At least 10 mL of a dialysate sample is required to measure a bacterial count lower than 0.1 cfu/mL, which is the maximum allowable count to maintain an ultrapure dialysate (9). The volume of the sample dialysate used for measurement of bacterial count was 10 mL or higher at 2440 (67.5%) of the 3616 facilities that responded to questions regarding the volume of the sample (Table 38).

Installation of ETRFs

There were 4157 facilities that responded to questions regarding the installation of ETRFs (99.5% of the 4177 facilities that responded to the questionnaire). Among these 4157 facilities, 3827 (92.1%) had at least one bedside console equipped with an ETRF (Table 39), an increase of 1.3% from 2010 (90.8%).

The survey found that 77.9% of bedside consoles were equipped with an ETRF (121 413 bedside consoles) in the 4157 facilities that responded to the questions (Table 40). The percentage of bedside consoles equipped with an ETRF was 74.4% at the end of 2010 and had increased by 3.5 points at the end of 2011.

Endotoxin concentration and bacterial count in dialysate for bedside consoles equipped with or without ETRF

The facilities that responded to questions regarding endotoxin concentration in the dialysate were divided into two groups: facilities that have at least one bedside console equipped with an ETRF (ETRF facilities) and facilities that have no bedside console

TABLE 35. *Frequencies of measurement and measured endotoxin concentrations in dialysate (EU/mL) (for facilities with the number of bedside consoles ≥1)*

Endotoxin concentration in dialysate (EU/mL)	None	Every day	Every week	Every two weeks	Every month	Several times per year	Once a year	Subtotal	Unspecified	No information available	Total
<0.001		13	86	139	1751	303	249	2541	8		2549
(%)		(0.5)	(3.4)	(5.5)	(68.9)	(11.9)	(9.8)	(100.0)			
0.001 ≦ < 0.01		3	14	22	475	109	79	702	2		704
(%)		(0.4)	(2.0)	(3.1)	(67.7)	(15.5)	(11.3)	(100.0)			
0.01 ≦ < 0.05		1	7	12	216	65	37	338			338
(%)		(0.3)	(2.1)	(3.6)	(63.9)	(19.2)	(10.9)	(100.0)			
0.05 ≦ < 0.1		1	3	3	66	24	21	118	1		119
(%)		(0.8)	(2.5)	(2.5)	(55.9)	(20.3)	(17.8)	(100.0)			
0.1 ≦ < 0.25			1	1	46	17	9	74			74
(%)			(1.4)	(1.4)	(62.2)	(23.0)	(12.2)	(100.0)			
0.25 ≦ < 0.5			1	1	24	12	6	44			44
(%)			(2.3)	(2.3)	(54.5)	(27.3)	(13.6)	(100.0)			
0.5 ≦		1		1	21	4	6	33	1		34
(%)		(3.0)		(3.0)	(63.6)	(12.1)	(18.2)	(100.0)			
Subtotal		19	112	179	2599	534	407	3850	12		3862
(%)		(0.5)	(2.9)	(4.6)	(67.5)	(13.9)	(10.6)	(100.0)			
Unspecified				1	3	12	11	27	85		112
(%)				(3.7)	(11.1)	(44.4)	(40.7)	(100.0)			
No information available	171				1	2		174	2	27	203
(%)	(98.3)				(0.6)	(1.1)		(100.0)			
Total	171	19	112	180	2603	548	418	4051	99	27	4177
(%)	(4.2)	(0.5)	(2.8)	(4.4)	(64.3)	(13.5)	(10.3)	(100.0)			

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

TABLE 36. *Frequencies of measurement of bacterial count in dialysate in different medical organizations (for facilities with the number of bedside consoles ≥1)*

Type of medical organization	None	Every day	Every week	Every two weeks	Every month	Several times per year	Once a year	Subtotal	Unspecified	No information available	Total
National and public universities	2		1	2	34	6	4	49	2	1	52
(%)	(4.1)		(2.0)	(4.1)	(69.4)	(12.2)	(8.2)	(100.0)			
Private universities	5		3	5	41	6	5	65	1		66
(%)	(7.7)		(4.6)	(7.7)	(63.1)	(9.2)	(7.7)	(100.0)			
National organizations	7			1	17	9	3	37	4		41
(%)	(18.9)			(2.7)	(45.9)	(24.3)	(8.1)	(100.0)			
Prefectural and municipal organizations	46	1	2	10	265	53	27	404	18	8	430
(%)	(11.4)	(0.2)	(0.5)	(2.5)	(65.6)	(13.1)	(6.7)	(100.0)			
Social insurance organizations	6			2	37	9	5	59	2		61
(%)	(10.2)			(3.4)	(62.7)	(15.3)	(8.5)	(100.0)			
Welfare federation of agricultural cooperatives	8		3	2	89	7	12	121	3		124
(%)	(6.6)		(2.5)	(1.7)	(73.6)	(5.8)	(9.9)	(100.0)			
Other public organizations	13		5	3	126	22	9	178	3	1	182
(%)	(7.3)		(2.8)	(1.7)	(70.8)	(12.4)	(5.1)	(100.0)			
Private general hospitals	9		4	9	67	10	14	113	2		115
(%)	(8.0)		(3.5)	(8.0)	(59.3)	(8.8)	(12.4)	(100.0)			
Private hospitals	85	1	25	46	697	135	125	1114	39	5	1158
(%)	(7.6)	(0.1)	(2.2)	(4.1)	(62.6)	(12.1)	(11.2)	(100.0)			
Private clinics	159	8	45	86	1157	199	196	1850	85	13	1948
(%)	(8.6)	(0.4)	(2.4)	(4.6)	(62.5)	(10.8)	(10.6)	(100.0)			
Total	340	10	88	166	2530	456	400	3990	159	28	4177
(%)	(8.5)	(0.3)	(2.2)	(4.2)	(63.4)	(11.4)	(10.0)	(100.0)			

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

TABLE 37. *Bacterial counts in dialysate (cfu/mL) for different cultivation media (for facilities with the number of bedside consoles ≥1)*

Media used for cultivation of bacteria in dialysate	<0.1	0.1~	1~	10~	100~	Subtotal	Unspecified	No information available	Total
General agar medium	160	45	30	17	2	254	12		266
(%)	(63.0)	(17.7)	(11.8)	(6.7)	(0.8)	(100.0)			
R2A medium†	1174	378	399	196	45	2192	21		2213
(%)	(53.6)	(17.2)	(18.2)	(8.9)	(2.1)	(100.0)			
TGEA medium‡	459	129	112	33	8	741	3	1	745
(%)	(61.9)	(17.4)	(15.1)	(4.5)	(1.1)	(100.0)			
Blood agar medium	11	4	5	1		21	1		22
(%)	(52.4)	(19.0)	(23.8)	(4.8)		(100.0)			
TSA medium§	18	1	2	2		23			23
(%)	(78.3)	(4.3)	(8.7)	(8.7)		(100.0)			
Other media	122	37	36	13	3	211	6		217
(%)	(57.8)	(17.5)	(17.1)	(6.2)	(1.4)	(100.0)			
Subtotal	1944	594	584	262	58	3442	43	1	3486
(%)	(56.5)	(17.3)	(17.0)	(7.6)	(1.7)	(100.0)			
Unspecified	70	23	24	11	4	132	184	215	531
(%)	(53.0)	(17.4)	(18.2)	(8.3)	(3.0)	(100.0)			
No information available	3					3		157	160
(%)	(100.0)					(100.0)			
Total	2017	617	608	273	62	3577	227	373	4177
(%)	(56.4)	(17.2)	(17.0)	(7.6)	(1.7)	(100.0)			

†R2A medium: Reasoner's no. 2 agar medium. ‡TGEA medium: Tryptone glucose extract agar medium. §TSA medium: Trypticase soy agar medium.
Values in parentheses under each figure represent the percentage relative to the total in each row.

TABLE 38. *Bacterial counts in dialysate (cfu/mL) for different volumes of samples for measurement of bacterial count (for facilities with the number of bedside consoles ≥1)*

Volume of sample for measurement of bacterial count in dialysate (mL)	<0.1	0.1~	1~	10~	100~	Subtotal	Unspecified	No information available	Total
<1	200	31	34	11		276	13		289
(%)	(72.5)	(11.2)	(12.3)	(4.0)		(100.0)			
1 ≤ < 10	395	176	189	88	15	863	24		887
(%)	(45.8)	(20.4)	(21.9)	(10.2)	(1.7)	(100.0)			
10 ≤ < 50	562	185	175	100	26	1048	16	1	1065
(%)	(53.6)	(17.7)	(16.7)	(9.5)	(2.5)	(100.0)			
50 ≤ < 100	610	157	150	51	14	982	9		991
(%)	(62.1)	(16.0)	(15.3)	(5.2)	(1.4)	(100.0)			
100 ≤ < 500	218	58	49	15	4	344	2		346
(%)	(63.4)	(16.9)	(14.2)	(4.4)	(1.2)	(100.0)			
500 ≤ < 1000	10	4	3	2	1	20			20
(%)	(50.0)	(20.0)	(15.0)	(10.0)	(5.0)	(100.0)			
1000 ≤ < 10 000	11	1	2			14	1		15
(%)	(78.6)	(7.1)	(14.3)			(100.0)			
10 000≤	1		1		1	3			3
(%)	(33.3)		(33.3)		(33.3)	(100.0)			
Subtotal	2007	612	603	267	61	3550	65	1	3616
(%)	(56.5)	(17.2)	(17.0)	(7.5)	(1.7)	(100.0)			
Unspecified	10	5	5	6	1	27	162	216	405
(%)	(37.0)	(18.5)	(18.5)	(22.2)	(3.7)	(100.0)			
No information available								156	156
(%)									
Total	2017	617	608	273	62	3577	227	373	4177
(%)	(56.4)	(17.2)	(17.0)	(7.6)	(1.7)	(100.0)			

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

TABLE 39. *Percentages of bedside consoles equipped with an ETRF (%) in different facilities classified by type of medical organization (for facilities with the number of bedside consoles ≥1)*

Type of medical organization	0 (No ETRF)	<10	10~	20~	30~	40~	50~	60~	70~	80~	90~	100 (All consoles equipped with ETRF)	Subtotal	No information available	Total	Mean	S.D.
National and public universities									1			50	51	1	52	99.55	3.23
(%)									(2.0)			(98.0)	(100.0)				
Private universities		1		1			1	2	2	2	3	54	66		66	94.00	17.38
(%)		(1.5)		(1.5)			(1.5)	(3.0)	(3.0)	(3.0)	(4.5)	(81.8)	(100.0)				
National organizations	1						1	1		3		35	41		41	94.30	18.16
(%)	(2.4)						(2.4)	(2.4)		(7.3)		(85.4)	(100.0)				
Prefectural and municipal organizations	18	12	9	5	8	8	6	10	5	5	25	314	425	5	430	85.76	30.11
(%)	(4.2)	(2.8)	(2.1)	(1.2)	(1.9)	(1.9)	(1.4)	(2.4)	(1.2)	(1.2)	(5.9)	(73.9)	(100.0)				
Social insurance organizations	4	1	3		3	2		2	1	4	5	36	61		61	79.69	33.83
(%)	(6.6)	(1.6)	(4.9)		(4.9)	(3.3)		(3.3)	(1.6)	(6.6)	(8.2)	(59.0)	(100.0)				
Welfare federation of agricultural cooperatives	1	4	3	1	3	5	1	4	4	5	5	88	124		124	86.51	26.96
(%)	(0.8)	(3.2)	(2.4)	(0.8)	(2.4)	(4.0)	(0.8)	(3.2)	(3.2)	(4.0)	(4.0)	(71.0)	(100.0)				
Other public organizations	7	4	7	2	3	1	3	2	3	8	9	132	181	1	182	85.90	30.11
(%)	(3.9)	(2.2)	(3.9)	(1.1)	(1.7)	(0.6)	(1.7)	(1.1)	(1.7)	(4.4)	(5.0)	(72.9)	(100.0)				
Private general hospitals	12	5	3	4		2	1		2	1	9	76	115		115	78.22	38.16
(%)	(10.4)	(4.3)	(2.6)	(3.5)		(1.7)	(0.9)		(1.7)	(0.9)	(7.8)	(66.1)	(100.0)				
Private hospitals	76	36	40	31	30	21	23	17	12	39	69	761	1155	3	1158	80.24	34.61
(%)	(6.6)	(3.1)	(3.5)	(2.7)	(2.6)	(1.8)	(2.0)	(1.5)	(1.0)	(3.4)	(6.0)	(65.9)	(100.0)				
Private clinics	211	91	82	53	41	34	44	36	30	62	99	1155	1938	10	1948	73.80	39.09
(%)	(10.9)	(4.7)	(4.2)	(2.7)	(2.1)	(1.8)	(2.3)	(1.9)	(1.5)	(3.2)	(5.1)	(59.6)	(100.0)				
Total	330	154	147	97	88	73	80	74	60	129	224	2701	4157	20	4177	78.77	35.99
(%)	(7.9)	(3.7)	(3.5)	(2.3)	(2.1)	(1.8)	(1.9)	(1.8)	(1.4)	(3.1)	(5.4)	(65.0)	(100.0)				

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

TABLE 40. *Numbers of consoles equipped with ETRF and those without ETRF and rate of ETRF installation in different facilities classified by type of medical organization as of the end of 2011 (for facilities with the number of bedside consoles ≥1)*

Type of medical organization	Number of facilities that responded to questions on ETRFs	Number of consoles with ETRF		Number of consoles without ETRF		Total number of consoles		Mean rate of ETRF installation	Number of facilities that did not provide the number of consoles with ETRF	Total number of facilities
		(Unit)	(%)	(Unit)	(%)	(Unit)	(%)	(%)		
National and public universities	51	528	99.44	3	0.56	531	100.00	99.55	1	52
Private universities	66	1 114	92.29	93	7.71	1 207	100.00	94.00		66
National organizations	41	393	94.02	25	5.98	418	100.00	94.30		41
Prefectural and municipal organizations	425	7 003	85.64	1 174	14.36	8 177	100.00	85.76	5	430
Social insurance organizations	61	1 215	78.24	338	21.76	1 553	100.00	79.69		61
Welfare federation of agricultural cooperatives	124	3 037	84.83	543	15.17	3 580	100.00	86.51		124
Other public organizations	181	3 682	85.21	639	14.79	4 321	100.00	85.90	1	182
Private general hospitals	115	2 508	77.82	715	22.18	3 223	100.00	78.22		115
Private hospitals	1155	27 028	79.06	7 158	20.94	34 186	100.00	80.24	3	1 158
Private clinics	1938	48 036	74.80	16 181	25.20	64 217	100.00	73.80	10	1 948
Total	4157	94 544	77.87	26 869	22.13	121 413	100.00	78.77	20	4 177

equipped with an ETRF (non-ETRF facilities). The endotoxin concentration in the dialysate was compared between the two groups. The percentages of facilities that satisfied an endotoxin concentration below 0.05 EU/mL, as recommended by the JSDT guidelines (9), were 94.5% for ETRF facilities and 88.1% for non-ETRF facilities (Table 41).

The bacterial count in the dialysate was similarly compared between the two groups. The percentages of facilities that satisfied a bacterial count below 100 cfu/mL, which is also recommended by the JSDT guidelines (9), were 98.7% for ETRF facilities and 96.7% for non-ETRF facilities (Table 42).

Endotoxin concentration and bacterial count in dialysate

An ultrapure dialysate is defined as having an endotoxin concentration below 0.001 EU/mL (lower than the detection limit) and a bacterial count below 0.1 cfu/mL. Among the 4177 facilities that responded to the questionnaire, 1735 (41.5%) satisfied the above standards for an ultrapure dialysate, an increase from the previous year (36.7%), as shown in Table 43. There were still facilities that reported an endotoxin concentration higher than the standard and a bacterial count lower than the standard, and vice versa. These facilities are required to optimize the method of sampling dialysate for measurement, the method of managing ETRFs, and cleaning and sterilization of dialysis equipment.

Items associated with PD

According to the facility survey, the number of PD patients was 9642 at the end of 2011. Moreover, the number of patients who underwent a non-PD method although they had a peritoneal catheter for PD (most of whom are considered to undergo only peritoneal lavage) was 369 and that of new patients who were started on PD in 2011 but introduced to other methods in the same year was 175. The sum of these patients and the abovementioned PD patients (i.e. the total number of PD-related patients) was 10 186 in 2011 (Table 1).

As mentioned above, among the survey items associated with PD in the patient survey, the following four items were surveyed in all the 4213 target facilities: current status of combined use of PD and another method, period on PD, history of undergoing PD, and history of EPS. The items associated with PD other than the above four items were surveyed only in the 3594 facilities that responded to the questionnaires using the electronic medium (USB memory devices).

In this survey, performance or non-performance of PET and the mean amount of water removed per day

TABLE 41. *Endotoxin concentrations in dialysate (EU/mL) in ETRF and non-ETRF facilities (for facilities with the number of bedside consoles ≥1)*

ETRF	<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
Non-ETRF facilities	481	188	103	51	30	12	11	876	29	102	1007
(%)	(54.9)	(21.5)	(11.8)	(5.8)	(3.4)	(1.4)	(1.3)	(100.0)			
ETRF facilities	2045	500	229	64	43	31	22	2934	45	15	2994
(%)	(69.7)	(17.0)	(7.8)	(2.2)	(1.5)	(1.1)	(0.7)	(100.0)			
Subtotal	2526	688	332	115	73	43	33	3810	74	117	4001
(%)	(66.3)	(18.1)	(8.7)	(3.0)	(1.9)	(1.1)	(0.9)	(100.0)			
Unspecified	22	16	6	4	1	1	1	51	38	25	114
(%)	(43.1)	(31.4)	(11.8)	(7.8)	(2.0)	(2.0)	(2.0)	(100.0)			
No information available	1							1		61	62
(%)	(100.0)							(100.0)			
Total	2549	704	338	119	74	44	34	3862	112	203	4177
(%)	(66.0)	(18.2)	(8.8)	(3.1)	(1.9)	(1.1)	(0.9)	(100.0)			

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

TABLE 42. *Bacterial counts in dialysate (cfu/mL) in ETRF and non-ETRF facilities (for facilities with the number of bedside consoles ≥1)*

ETRF	<0.1	0.1~	1~	10~	100~	Subtotal	Unspecified	No information available	Total
Non-ETRF facilities	342	173	161	85	26	787	70	150	1007
(%)	(43.5)	(22.0)	(20.5)	(10.8)	(3.3)	(100.0)			
ETRF facilities	1661	434	433	184	36	2748	115	131	2994
(%)	(60.4)	(15.8)	(15.8)	(6.7)	(1.3)	(100.0)			
Subtotal	2003	607	594	269	62	3535	185	281	4001
(%)	(56.7)	(17.2)	(16.8)	(7.6)	(1.8)	(100.0)			
Unspecified	13	10	14	4		41	42	31	114
(%)	(31.7)	(24.4)	(34.1)	(9.8)		(100.0)			
No information available	1					1		61	62
(%)	(100.0)					(100.0)			
Total	2017	617	608	273	62	3577	227	373	4177
(%)	(56.4)	(17.2)	(17.0)	(7.6)	(1.7)	(100.0)			

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

TABLE 43. *Endotoxin concentrations (EU/mL) and bacterial counts (cfu/mL) in dialysate in different facilities (for facilities with the number of bedside consoles ≥1)*

Bacterial count in dialysate (cfu/mL)	<0.001	0.001≤ <0.01	0.01≤ <0.05	0.05≤ <0.1	0.1≤ <0.25	0.2≤ <0.5	0.5≤	Subtotal	Unspecified	No information available	Total
<0.1	1735	199	47	13	6	7	4	2011	1	5	2017
(%)	(86.3)	(9.9)	(2.3)	(0.6)	(0.3)	(0.3)	(0.2)	(100.0)			
0.1~	331	192	58	20	10	2	3	616	1		617
(%)	(53.7)	(31.2)	(9.4)	(3.2)	(1.6)	(0.3)	(0.5)	(100.0)			
1~	246	178	108	33	28	7	4	604	3	1	608
(%)	(40.7)	(29.5)	(17.9)	(5.5)	(4.6)	(1.2)	(0.7)	(100.0)			
10~	75	60	78	26	14	12	7	272	1		273
(%)	(27.6)	(22.1)	(28.7)	(9.6)	(5.1)	(4.4)	(2.6)	(100.0)			
100~	9	7	13	9	7	8	9	62			62
(%)	(14.5)	(11.3)	(21.0)	(14.5)	(11.3)	(12.9)	(14.5)	(100.0)			
Subtotal	2396	636	304	101	65	36	27	3565	6	6	3577
(%)	(67.2)	(17.8)	(8.5)	(2.8)	(1.8)	(1.0)	(0.8)	(100.0)			
Unspecified	56	25	13	7	5	4	4	114	89	24	227
(%)	(49.1)	(21.9)	(11.4)	(6.1)	(4.4)	(3.5)	(3.5)	(100.0)			
No information available	97	43	21	11	4	4	3	183	17	173	373
(%)	(53.0)	(23.5)	(11.5)	(6.0)	(2.2)	(2.2)	(1.6)	(100.0)			
Total	2549	704	338	119	74	44	34	3862	112	203	4177
(%)	(66.0)	(18.2)	(8.8)	(3.1)	(1.9)	(1.1)	(0.9)	(100.0)			

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

were surveyed for the first time. The history of EPS was surveyed only for the facilities that responded to the questionnaires using the electronic medium at the end of 2010 but for all the target facilities at the end of 2011.

Current status of combined use of PD and another method (e.g. HD, HDF) for different main dialysis methods

Table 44 shows the current status of combined use of PD and another method for patients and their main dialysis method, examined in the patient survey of all the target facilities. The classification of main dialysis methods is based on the classification codes for dialysis methods that have conventionally been used in the patient survey.

Among the 295 231 patients who provided valid responses to questions regarding the current status of combined use of PD and another method in the patient survey (excluding patients who answered "unspecified" and provided no information available), 286 093 (96.9%) underwent a non-PD method alone such as HD (i.e. non-PD patients) and 9138 (3.1%) underwent PD alone or with another method such as HD.

Among the 286 093 patients who answered "non-PD method only" to questions regarding the current status of combined use of PD and another method, 350 patients had a peritoneal catheter for PD (i.e. non-PD + catheter patients). Most of these patients were considered to have been introduced from PD to HD but have not had their PD catheter removed. There were also six non-PD + catheter patients among the 322 patients who underwent HD at home. These six non-PD + catheter patients are considered to have been introduced from PD to HD at home most recently.

In this survey report, non-PD + catheter patients were tentatively classified and counted as patients who did not undergo PD to analyze the survey data. Note that the JSDT Statistical Survey Committee does not intend to standardize the above definition.

The number of patients who answered "PD only" to questions regarding the current status of combined use of PD and another method was 7370, which was 2.5% of the 295 231 patients who provided valid responses to the above questions and 80.7% of the total number of patients who underwent PD in some form (9138 patients). Moreover, the number of patients who answered "combined use of PD and another method" was 1768, which was 0.6% of the above 295 231 patients and 19.3% of the abovementioned 9138 patients.

TABLE 44. *Current status of combined use of PD and another method for different main dialysis methods (for all target dialysis patients)*

			Main dialysis method*						Total	(Percentage relative to subtotal in column)	(Percentage relative to total in column)
			Facility HD	HDF	Hemo-filtration	Hemo-adsorption	Home HD	PD			
Combined use of PD and another method	Patients who did not undergo PD (Non-PD patients)	Non-PD + non-catheter patients	269 215	14 085	167	1960	316	0	285 743	(99.9)	(96.8)
		(Percentage relative to total in row)	(94.2)	(4.9)	(0.1)	(0.7)	(0.1)	(0.0)	(100.0)		
		Non-PD + catheter patients**	335	9	0	0	6	0	350	(0.1)	(0.1)
		(Percentage relative to total in row)	(95.7)	(2.6)	(0.0)	(0.0)	(1.7)	(0.0)	(100.0)		
		Total number of non-PD patients	269 550	14 094	167	1960	322	0	286 093	(100.0)	(96.9)
		(Percentage relative to total in row)	(94.2)	(4.9)	(0.1)	(0.7)	(0.1)	(0.0)	(100.0)		
	Patients who underwent PD (PD patients)***	PD only	0	0	0	0	0	7370	7370	(80.7)	(2.5)
		(Percentage relative to total in row)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(100.0)	(100.0)		
		Patients who underwent PD and another method (PD + HD patients): PD + HD once a week	0	0	0	0	0	1393	1393	(15.2)	(0.5)
		(Percentage relative to total in row)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(100.0)	(100.0)		
		PD + HD twice a week	42	1	0	0	0	181	224	(2.5)	(0.1)
		(Percentage relative to total in row)	(18.8)	(0.4)	(0.0)	(0.0)	(0.0)	(80.8)	(100.0)		
		PD + HD three times a week	37	4	0	0	0	5	46	(0.5)	(0.0)
		(Percentage relative to total in row)	(80.4)	(8.7)	(0.0)	(0.0)	(0.0)	(10.9)	(100.0)		
		PD + HD four times a week	0	0	0	0	0	0	0	(0.0)	(0.0)
		(Percentage relative to total in row)	—	—	—	—	—	—	—		
		PD + HD at other frequencies	11	3	0	4	0	87	105	(1.1)	(0.0)
		(Percentage relative to total in row)	(10.5)	(2.9)	(0.0)	(3.8)	(0.0)	(82.9)	(100.0)		
		Total number of PD + HD patients	90	8	0	4	0	1666	1768	(19.3)	(0.6)
		(Percentage relative to total in row)	(5.1)	(0.5)	(0.0)	(0.2)	(0.0)	(94.2)	(100.0)		
		Total number of PD patients	90	8	0	4	0	9036	9138	(100.0)	(3.1)
		(Percentage relative to total in row)	(1.0)	(0.1)	(0.0)	(0.0)	(0.0)	(98.9)	(100.0)		
	Total number of non-PD and PD patients		269 640	14 102	167	1964	322	9036	295 231		(100.0)
	(Percentage relative to total in row)		(91.3)	(4.8)	(0.1)	(0.7)	(0.1)	(3.1)	(100.0)		
	Unspecified		17	1	0	0	0	12	30		
	(Percentage relative to total in row)		(56.7)	(3.3)	(0.0)	(0.0)	(0.0)	(40.0)	(100.0)		
	No information available		415	12	0	1	0	46	474		
	(Percentage relative to total in row)		(87.6)	(2.5)	(0.0)	(0.2)	(0.0)	(9.7)	(100.0)		
Total			270 072	14 115	167	1965	322	9094	295 735		
(Percentage relative to total in row)			(91.3)	(4.8)	(0.1)	(0.7)	(0.1)	(3.1)	(100.0)		

*Main dialysis methods are classified on the basis of the classification codes for dialysis methods that have conventionally been used in the annual survey.

**In this survey, patients who did not undergo PD despite having a peritoneal catheter for PD (including those who underwent only peritoneal lavage) were tentatively classified as patients who did not undergo PD (i.e. non-PD patients) to analyze the survey data. It is not intended to standardize the above definition.

***In this survey, both patients who underwent PD only and those who underwent PD and another method were tentatively classified as patients who underwent PD (i.e. PD patients) to analyze the survey data. It is not intended to standardize the above definition.

Note: The selection of the classification code for the dialysis method of the patients classified in the shaded area in the table, i.e. PD + HD patients, was left to the subjective decision of the respondents.

Among the 1768 patients who answered "combined use of PD and another method", 1393 (78.8%) underwent a non-PD method such as HD once a week; 224 (12.7%) underwent a non-PD method twice a week; 46 (2.6%) underwent a non-PD method three times a week; and none of the patients underwent a non-PD method four times a week. There were also 105 patients (5.9%) who answered "combined use of PD and another method" in forms other than those classified above.

The main dialysis methods of the 1768 patients who answered "combined use of PD and another method" were distributed from facility HD to PD (shaded area in Table 44). In this survey, the selection of the classification code for the main dialysis method for these patients was left to the subjective decision of the respondents. Therefore, the patient distribution of the main dialysis methods among the 1768 patients who underwent PD and another method, as determined in this survey (shaded area in the table), strongly depended on the subjective decision of the respondents.

In this survey report on the combined use of PD and another method, patients who underwent PD in some form were tentatively classified and counted as patients who underwent PD to analyze the survey data. Note that the JSDT Statistical Survey Committee does not intend to standardize the above definition.

Incidentally, the main dialysis methods (surveyed on the basis of the conventional classification codes) and the combined use of PD and another method were independently surveyed. Therefore, there would be contradicting responses in these two survey items. For example, some patients would answer "PD" as the main dialysis method but answer "non-PD method only" to questions regarding the combined use of PD and another method. Conversely, some patients would answer "facility HD" as the main dialysis method but answer "PD only" to questions regarding the combined use of PD and another method. Other contradicting combinations of responses could also be observed. For facilities that responded to the questionnaires using the electronic medium, such contradicting responses were avoided because a macro program that raised a warning to potential contradictory responses was incorporated into the Excel spreadsheet. However, this method was not applicable to facilities that used the paper medium only. Therefore, the staff of the JSDT Statistical Survey Committee Office manually checked each of the responses on the collected survey sheets and corrected any contradictory responses by directly asking the target facilities.

Current status of combined use of PD and another method (e.g. HD, HDF) for different periods on PD

In this survey, the types of dialysis method (e.g. HD, PD) for the target patients were determined annually by surveying the dialysis methods of the patients as of the survey date (i.e. 31 December each year). That is, it was not surveyed when the patients started on one dialysis method were introduced to another dialysis method (for example, from HD to PD). Therefore, the period on PD, i.e. the period from the start of PD, of patients was determined only by following the type of dialysis method as of the survey date (the end of each year) determined in each survey report. However, the period on PD of PD patients (i.e. how long each patient has undergone PD) started to be surveyed at the end of 2009. The target patients were only those who underwent PD as of the survey date.

Table 45 shows the current status of the combined use of PD and another method for different periods on PD among the 5682 patients who responded to questions regarding the combined use and period on PD. The percentage of patients who underwent PD and another method such as HD increased with period on PD: less than 1 year, 5.3%; 1–2 years, 8.5%; 2–4 years, 16.7%; 4–8 years, 30.6%; and 8 years or longer, 51.2%

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Attached table: District Cooperative Committee: Noritomo Itami, Chikara Oyama, Norio Nakamura, Koji Seino, Tomoyoshi Kimura, Kazuyuki Suzuki, Shigeru Sato, Shigeru Miyagata, Minoru Ito, Ikuto Masakane, Masaaki Nakayama, Kunihiro Yamagata, Eiji Kusano, Shigeaki Muto, Hironobu Kawai, Hiromichi Suzuki, Kaoru Tabei, Makoto Ogura, Noriyoshi Murotani, Takahiro Mochizuki, Masanori Abe, Ryoichi Ando, Akira Ishikawa, Kazuyoshi Okada, Tetsuya Kashiwagi, Satoru Kuriyama, Tsutomu Sanaka, Toshio Shinoda, Eisei Noiri, Matsuhiko Hayashi, Koju Kamata, Eriko Kinugasa, Takatoshi Kakuta, Fumihiko Koiwa, Toru Hyodo, Junichiro Kazama, Hiroki Maruyama, Hiroyuki Iida, Yoichi Ishida, Hitoshi Yokoyama, Ryoichi Miyazaki, Mizuya Fukasawa, Haruo Yamashita,Kazuhiko Hora, Yutaka Kanno, Shigeki Sawada, Hiroshi Oda, Akihiko Kato, Noriko Mori, Yasuhiko Ito, Yuzo Watanabe, Shinsuke Nomura, Takashi Uzu, Tsuguru Hatta, Noriyuki Iwamoto, Yoshiaki Takemoto, Toshihide Naganuma, Tomoyuki Yamakawa, Takeshi Nakanishi, Soshu Shin, Katsunori Yoshida, Takashi Shigematsu, Akihisa Nakaoka, Chishio Munemura, Takafumi Ito, Keiko Suzuki, Makoto Hiramatsu, Noriaki Yorioka, Koichi Uchiyama, Yutaka Nitta, Hirofumi Hashimoto, Akira Numata, Atsumi Harada, Masanobu Tanimura, Kenji Yuasa, Seiya Okuda, Hideki Hirakata,

TABLE 45. *Current status of combined use of PD and another method for different periods on dialysis (for patients who were considered to undergo PD in some form)*

Period on PD (year)	non-PD	PD only	Non-PD + catheter	PD + HD once a week	PD + HD twice a week	PD + HD three times a week	PD + HD four times a week	PD + HD at other frequencies	Subtotal	Unspecified	No information available	Total
<1		1116		46	5	5		6	1178			1178
(%)		(94.7)		(3.9)	(0.4)	(0.4)		(0.5)	(100.0)			
1~		876		65	9	3		4	957			957
(%)		(91.5)		(6.8)	(0.9)	(0.3)		(0.4)	(100.0)			
2~		1279		207	33	7		9	1535			1535
(%)		(83.3)		(13.5)	(2.1)	(0.5)		(0.6)	(100.0)			
4~		1000		352	57	8		23	1440			1440
(%)		(69.4)		(24.4)	(4.0)	(0.6)		(1.6)	(100.0)			
8~		279		215	46	7		25	572			572
(%)		(48.8)		(37.6)	(8.0)	(1.2)		(4.4)	(100.0)			
Subtotal		4550		885	150	30		67	5682			5682
(%)		(80.1)		(15.6)	(2.6)	(0.5)		(1.2)	(100.0)			
No information available		2820		508	74	16		38	3456			3456
(%)		(81.6)		(14.7)	(2.1)	(0.5)		(1.1)	(100.0)			
Total		7370		1393	224	46		105	9138			9138
(%)		(80.7)		(15.2)	(2.5)	(0.5)		(1.1)	(100.0)			
Mean		2.62		5.44	6.15	4.87		6.69	3.22			3.22
S.D.		2.84		3.96	4.10	4.39		4.94	3.34			3.34

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

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