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The information presented here on global end-stage renal disease (ESRD) demographics and selected trends was retrieved in the 2005 global Fresenius Medical Care survey. Of the more than 230 countries (or areas of special sovereignty) worldwide, 124 countries are reported to provide dialysis care to patients with renal failure. The annual Fresenius Medical Care survey collects and consolidates data from these countries, thereby providing a unique insight into the ESRD and dialysis patient populations, their global distributions and the treatment modalities employed.

In numerous countries, renal registries and other official organisations are valuable sources of extensive information on various aspects of ESRD demographics, treatment practices and outcomes. Such information provides a solid base for international comparisons and aids understanding of treatment policies and their implications for the well-being of patients. Conclusions drawn from such data provide knowledge of value to both medical communities and policy makers throughout the world.

However, data collection and analysis requires extensive resources, and a time lapse between data collection and publication is unavoidable. In addition, a complete global picture cannot be derived from national registry data alone, as a significant portion of the countries that provide dialysis care do not have official renal registries or do not publish corresponding data. Through its worldwide network, Fresenius Medical Care is in a position to efficiently retrieve and process ESRD patient demographic data on a global and regional level. Key results are presented here.

# Global View of ESRD Patients

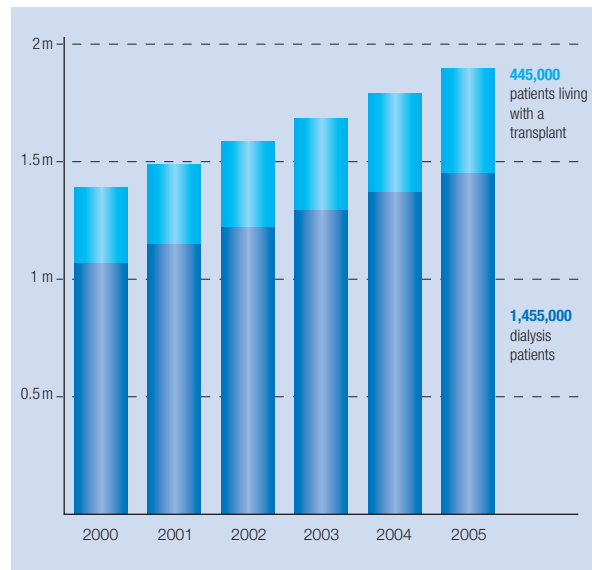
<b>ESRD Patients</b>	<b>1,900,000</b>
thereof HD	1,297,000
thereof PD	158,000
thereof Tx	445,000
<b>World Population</b>	<b>6.5 billion</b>

<b>Annual Growth Rates</b>	
World population	1.2%
ESRD	~6%
HD	~6%
PD	5-6%
Tx	~7%

The number of patients being treated for ESRD globally reached around 1.9 million at the end of 2005 and, with a 6% growth rate, continues to increase at a significantly higher rate than the world population.

Of these 1.9 million ESRD patients, over 1.45 million were undergoing dialysis treatment (haemodialysis (HD) or peritoneal dialysis (PD)) and around 445,000 people were living with kidney transplants (Tx).

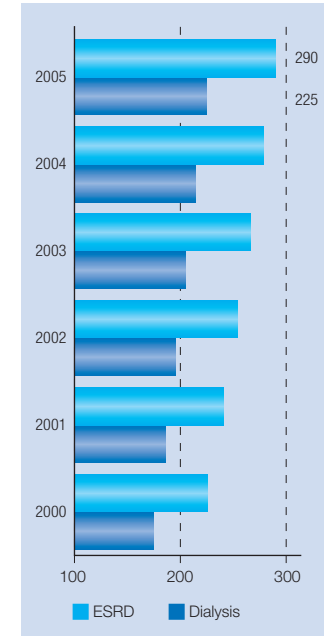
The populations of ESRD patients, dialysis patients and patients living with a transplanted kidney have increased steadily over the past years, whereby consistently more than three-quarters of all ESRD patients were treated by dialysis.



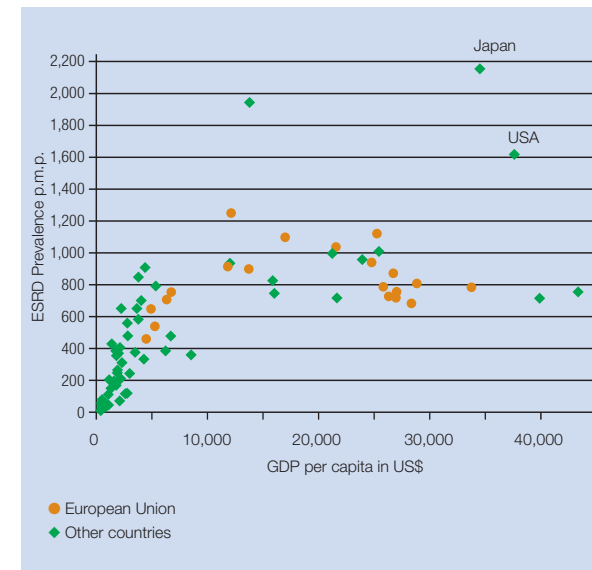
Development of global ESRD patient numbers since 2000

The prevalence of treated ESRD patients in the general population shows a high global variation, ranging from under 100 to over 1,600 patients per million population (p.m.p.). ESRD prevalence is above 2,100 p.m.p. in Japan, exceeds 1,600 p.m.p. in the USA, and averages close to 900 p.m.p. in the European Union. The much lower global average of 290 p.m.p. suggests that, from the global perspective, access to treatment is still limited in many countries and a number of patients with terminal renal failure do not receive treatment. Increasing global prevalence values over the years indicate a gradual improvement.

A comparison of national economic strength (expressed as gross domestic product (GDP)) with prevalence of ESRD suggests that economic factors may impose restrictions on treatment. A restriction is indicated in countries where the GDP per capita is below a limiting value. Further analysis shows that there is no correlation between economic strength and ESRD prevalence in countries with a GDP of over \$10,000 per person per year.

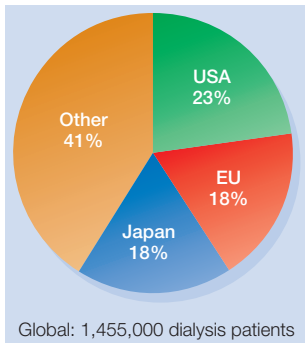


Development of global ESRD and dialysis prevalence values since 2000 (patients per million population)



Prevalence of ESRD vs. economic welfare in the 75 countries representing 99% of the global ESRD patient population

# Global View of Dialysis Patients



From a global view, most dialysis patients can be allocated to three major geographical regions: the USA, the European Union (EU) and Japan. Almost 60% of all dialysis patients are treated in these 27 countries.

In fact, around 50% of the global dialysis patient population is treated in just four countries – the USA, Japan, Brazil and Germany – although these together account for only around 11% of the world population. The different values for the prevalence of dialysis in the five countries with the largest dialysis patient populations, ranging from as little as 40 in China to 2,050 p.m.p. in Japan, are an indication of the widely varying situation regarding dialysis treatment practices. The next 10 countries ranked by the size of their dialysis patient population (i.e. countries 6–15 in the table below) account for 23% of the global dialysis patient population and 9% of the world population. The remaining 23% of global dialysis patients are treated in more than 100 different countries representing more than 50% of the world population (i.e. countries 16–124).

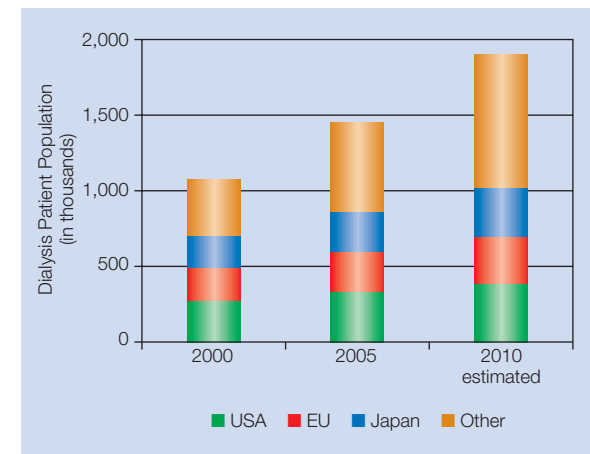
Regional distribution of dialysis patients compared to the general population

Countries ranked by dialysis population	Population (million)	% of world population	Dialysis patients (thousand)	% of total dialysis patients	Prevalence of dialysis (p.m.p.)
USA	297	5%	330	23%	1,110
Japan	127	2%	261	18%	2,050
Brazil	187	3%	70	5%	375
Germany	82	1%	69	5%	840
China	1,310	20%	53	4%	40
Countries 6 to 15	590	9%	331	23%	560
Countries 16 to 124	3,390	52%	341	23%	100
Countries 125 to 232	507	8%	0	0%	0
<b>Total</b>	<b>6,490</b>		<b>1,455</b>		<b>225</b>

In the USA, Japan and the European Union, dialysis patient population growth rates between 2004 and 2005 were in a narrow range of 3–5% and, as such, were significantly lower than growth rates in regions such as Asia, Latin America, the Middle East and Africa. This variation in growth rates may be partially explained by differences in demographics and the maturity of dialysis programmes, i.e. an increasing access to dialysis programs in developing countries.

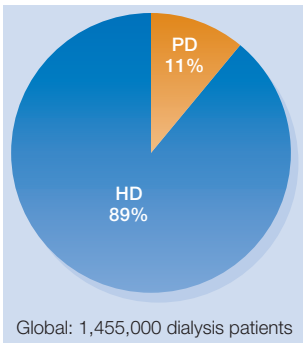
Annual Regional Dialysis Population Growth Rates	
USA	~3%
European Union	3–4%
Japan	4–5%
Other	8–10%
<b>Total</b>	<b>~6%</b>

Extrapolation of patient populations based on current growth rates suggests a change in the regional distribution of patients over the next 5 years: a significantly higher proportion of patients may undergo dialysis treatment in Asia, Latin America, Eastern Europe, the Middle East and Africa. This trend becomes particularly clear when present data are compared with corresponding data from the year 2000.



Development of dialysis patient population split by geographical region

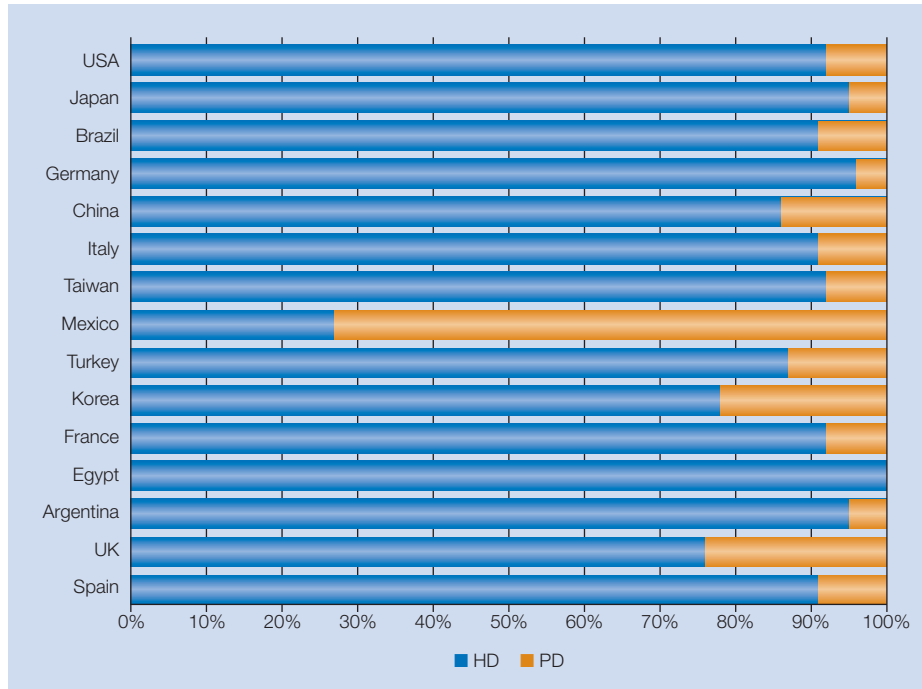
# Global View of Haemodialysis Patients



At the end of year 2005, haemodialysis remained the most common treatment modality, with approximately 1,297,000 patients undergoing haemodialysis (89% of all dialysis patients) and around 158,000 patients undergoing peritoneal dialysis (11% of all dialysis patients).

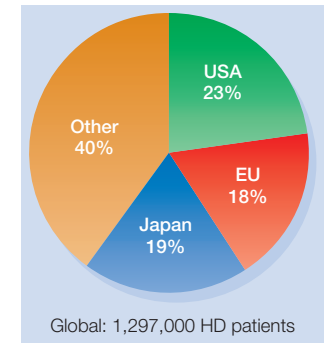
Analysis of the 15 countries with the largest dialysis patient populations indicates that the global HD to PD distribution ratio is not reflected in all countries. Countries such as Mexico, the UK and the Republic of Korea have a significantly higher proportion of PD patients, while Japan, Germany, Egypt and Argentina have clearly less PD patients compared to the global average. With the exception of Mexico, HD is the predominant treatment modality in these 15 countries.

Comparison of HD and PD patient numbers in the 15 largest countries ranked by total dialysis patient population



The global distribution and growth rate of haemodialysis patients strongly reflect the global distribution and growth rate of dialysis patients in general.

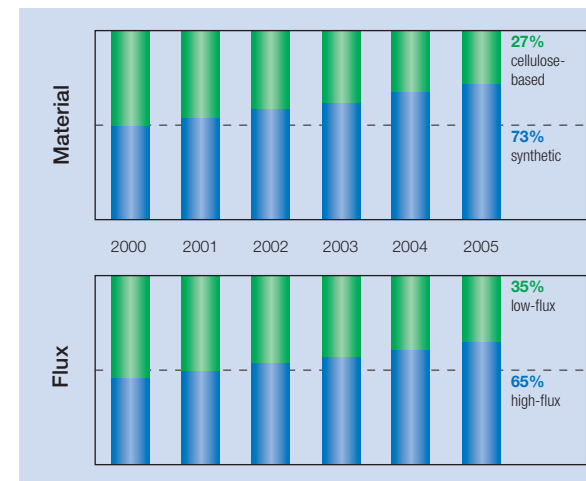
Most haemodialysis patients undergo treatment in dialysis centres. At the end of year 2005, it was estimated that the great majority of the 1,297,000 HD patients were treated in 24,300 centres worldwide with an average of 53 patients per centre. Further analysis reveals that 46% of dialysis centres lie within the public sector or belong to healthcare organisations, while the remaining 54% are private. However, large geographical variations are evident; for example, more than 98% of centres are private in the USA (private nephrologists and company providers) while only around 40% are so in the European Union.



Annual Regional HD Population Growth Rates	
USA	~3%
European Union	3-4%
Japan	4-5%
Other	8-10%
<b>Total</b>	<b>~6%</b>

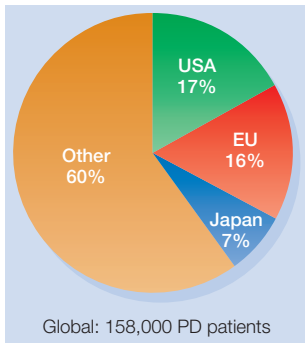
Analysis of the different dialyser types selected for the treatment of haemodialysis patients in 2005 and comparison with previous years showed a prevailing trend towards synthetic dialysis membranes and high-flux dialysers. Of all dialysers now utilized, around 73% contain a synthetic membrane and 65% are high-flux, while the corresponding values in the year 2000 were only 50% and 46%, respectively.

Global Patient and Centre Numbers	
HD patients	1,297,000
HD centres	24,300
<b>Average number of patients per centre</b>	<b>53</b>



Development of dialyser numbers by membrane type since 2000

# Global View of Peritoneal Dialysis Patients

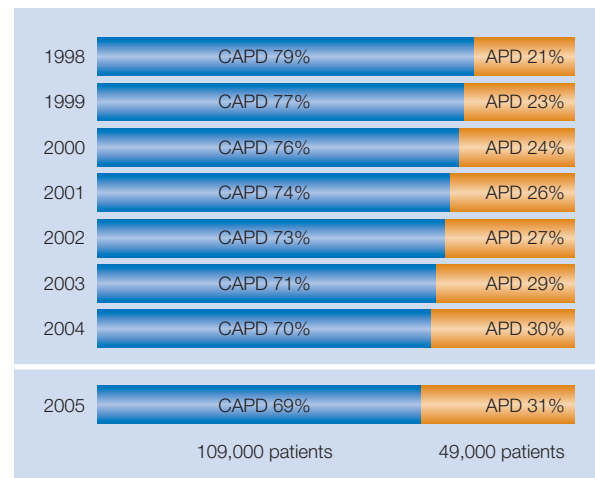


The regional distribution of peritoneal dialysis patients differs from that of both HD patients and dialysis patients in general in that Japan has fewer patients and the “Other” countries have more patients – only around 5% of dialysis patients are treated by peritoneal dialysis in Japan, while this treatment modality is relatively popular in some countries in Latin America and Asia. As already mentioned, large PD patient populations, relative to HD, are to be found in Mexico, the UK and the Republic of Korea.

Annual Regional PD Population Growth Rates	
USA	~ -1%
European Union	~ -1%
Japan	~ 2%
Other	8–10%
<b>Total</b>	<b>5–6%</b>

With an average of 5–6%, peritoneal dialysis growth rates in 2005 were in the same range as the corresponding haemodialysis growth rates. As in the case of HD, significantly higher growth rates were observed in Asia, Latin America, the Middle East and Africa (region “Other”) than in the three major single geographical regions (USA, EU and Japan). Growth in peritoneal dialysis was again driven by automated peritoneal dialysis (APD). Use of this modality increased by 8–10% in 2005 compared to a 3–4% increase for continuous ambulatory peritoneal dialysis (CAPD). Since 1998, utilisation of APD has increased from 21% of the total PD population to 31% today. Again, strong regional variations in the allocation of patients to either CAPD or APD are evident, with over 50% of patients undergoing APD in some countries.

Annual PD System Growth Rates	
CAPD	3–4%
APD	8–10%
<b>Total</b>	<b>5–6%</b>



Comparison of CAPD and APD patient numbers over the years 1998–2005

The data presented here is derived from information consolidated from 124 countries worldwide.

All data referring to ESRD patients, unless labelled otherwise, refer to the end of year 2005.

Growth rates displayed are the 2004 to 2005 annual growth rates.

All data referring to the European Union (EU) describe the status as from May 1st 2004 (i.e. 25 countries).

Fresenius Medical Care AG is the world's leading provider of dialysis products and medical care for patients with chronic renal failure.



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