


# **ESRD Patients in 2006**

A Global Perspective



Fresenius Medical Care

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# Preface

The information presented here on global end-stage renal disease (ESRD) demographics and selected trends was retrieved in the 2006 global Fresenius Medical Care survey. Of the more than 230 countries (or areas of special sovereignty) worldwide, 140 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alone, as a significant portion of the countries that provide dialysis care do not have official renal registries or do not publish corresponding data.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

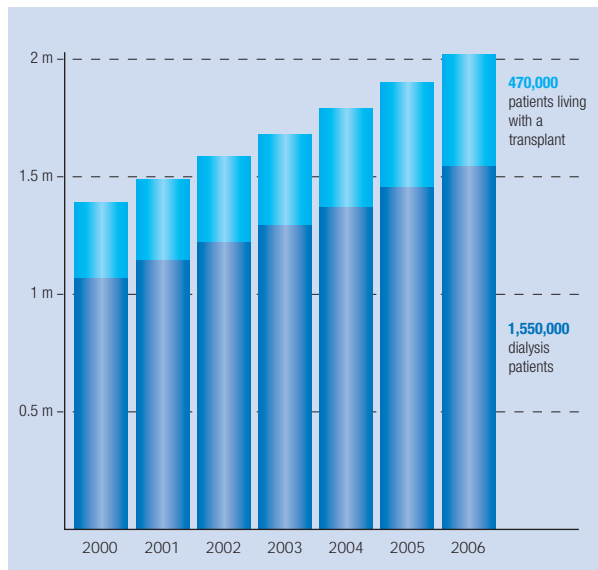
<b>ESRD Patients</b>	<b>2,020,000</b>
thereof HD	1,380,000
thereof PD	170,000
thereof Tx	470,000
<b>World Population</b>	<b>6.5 billion</b>

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

The number of patients being treated for ESRD globally exceeded 2 million at the end of 2006 and, with a 6% growth rate, continues to increase at a significantly higher rate than the world population.

Of these 2 million ESRD patients, approximately 1.55 million were undergoing dialysis treatment (haemodialysis (HD) or peritoneal dialysis (PD)) and around 470,000 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.

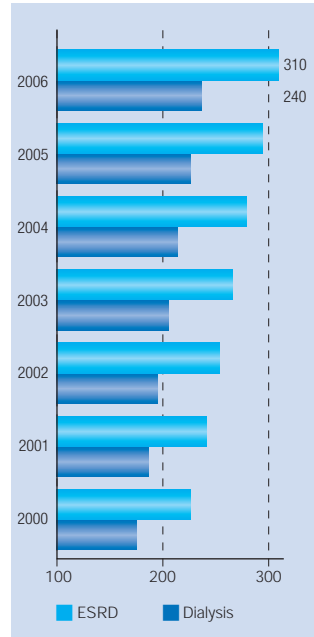


*Development of ESRD patient numbers since 2000*

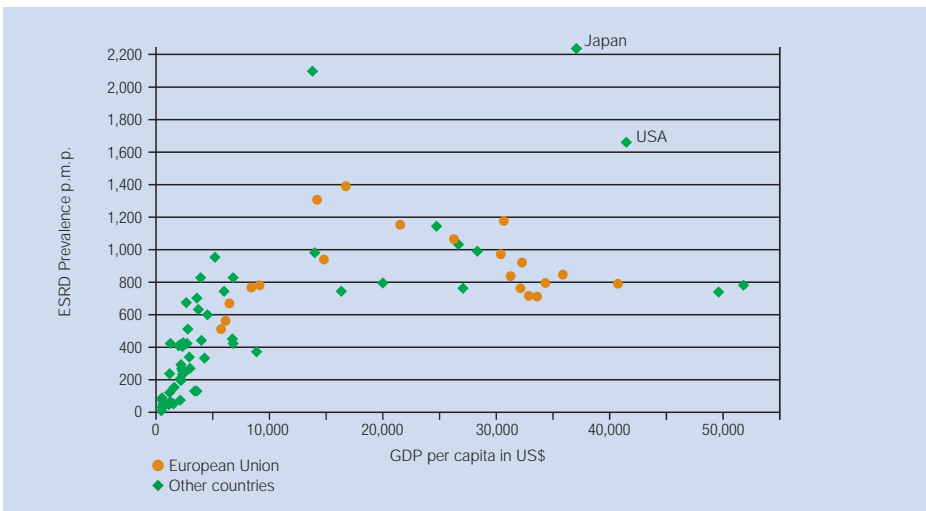
The prevalence of treated ESRD patients in the general population shows a high global variation, ranging from under 100 to over 2,000 patients per million population (p.m.p.). ESRD prevalence is around 2,230 p.m.p. in Japan, around 1,650 p.m.p. in the USA, and averages about 930 p.m.p. in the European Union. The much lower global average of 310 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.

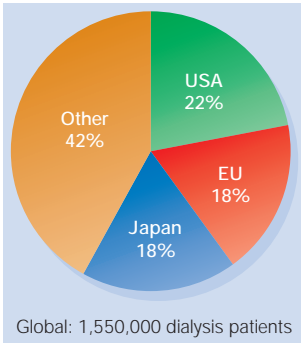
Development of global ESRD and dialysis prevalence values since 2000 (patients per million population)



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, almost 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 45 in China to 2,130 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 25% of the world population. The remaining 24% of global dialysis patients are treated in more than 120 different countries representing around 40% of the world population (i.e. countries 16–140).

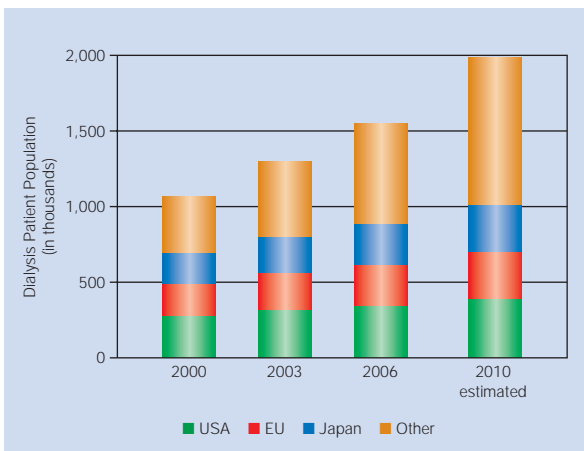
*Regional distribution of dialysis patients compared to the general population*

Countries ranked by dialysis population	Population (million)	% of world population	Dialysis patients (thousand)	% of total dialysis patients	Prevalence of dialysis (p.m.p.)
USA	300	5%	340	22%	1,130
Japan	127	2%	271	18%	2,130
Brazil	189	3%	77	5%	410
Germany	82	1%	71	5%	870
China	1,318	20%	59	4%	45
Countries 6 to 15	1,656	25%	353	23%	210
Countries 16 to 140	2,589	40%	376	24%	145
Countries 140 to 232	280	4%	0	0%	0
<b>Total</b>	<b>6,540</b>		<b>1,550</b>		<b>240</b>

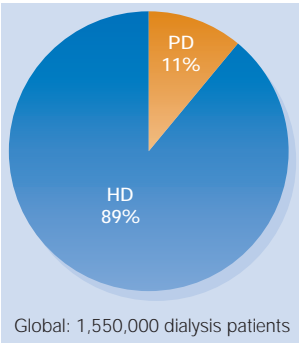
In the USA, Japan and the European Union, dialysis patient population growth rates between 2005 and 2006 were in a narrow range of 3–5% and, as such, were significantly lower than grow rates in regions such as Asia, Latin America, the Middle East and Africa. This variation in growth rates may be partially 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%
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 by the year 2010: 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 years 2000 and 2003.



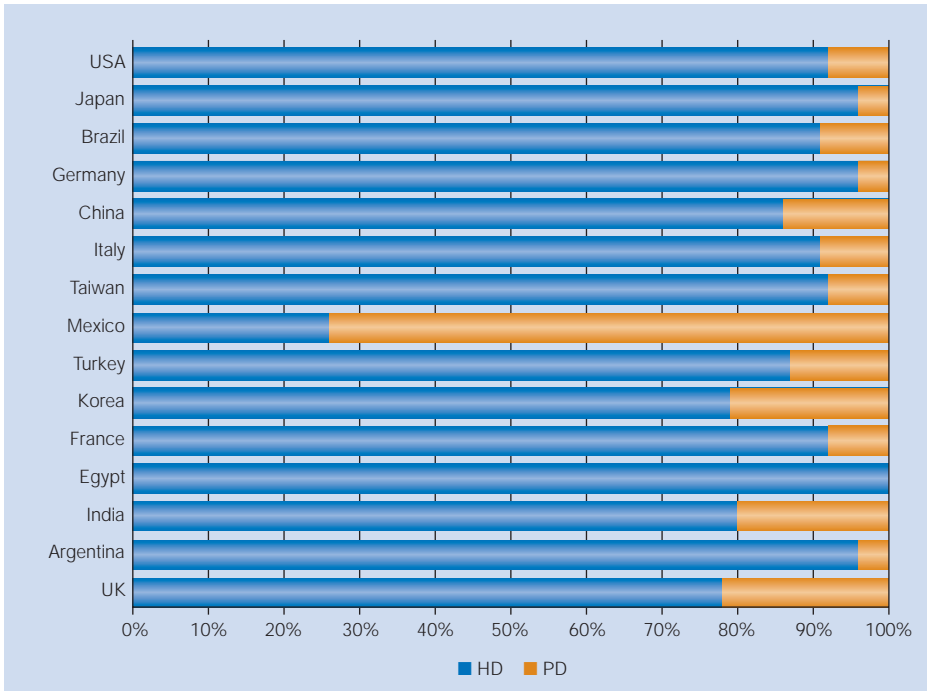
*Development of dialysis patient population split by geographical region*



At the end of year 2006, haemodialysis remained the most common treatment modality, with approximately 1,380,000 patients undergoing haemodialysis (89% of all dialysis patients) and around 170,000 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, the Republic of Korea and India 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*



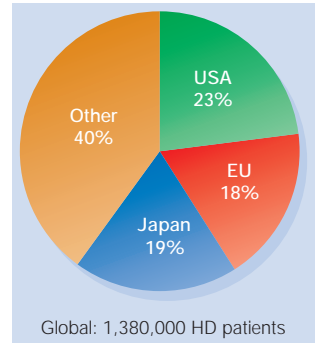


# Global View of Haemodialysis Patients

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

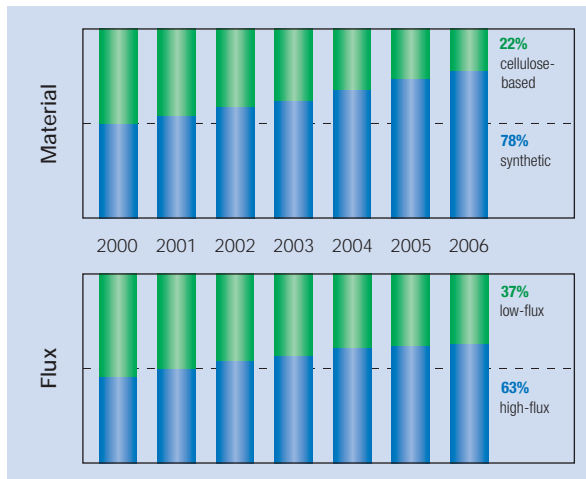
Most haemodialysis patients undergo treatment in dialysis centres. At the end of year 2006, it was estimated that the great majority of the 1,380,000 HD patients were treated in 25,500 centres worldwide with an average of 54 patients per centre. Further analysis reveals that 48% of dialysis centres lie within the public sector or belong to healthcare organisations, while the remaining 52% are private. However, large geographical variations are evident; for example, around 99% of centres are private in the USA (private nephrologists and company providers) while only around 39% are so in the European Union.

Analysis of the different dialyser types selected for the treatment of haemodialysis patients in 2006 and comparison with previous years showed a prevailing trend towards synthetic dialysis membranes and high-flux dialysers. Of all dialysers now utilized, around 78% contain a synthetic membrane and 63% are high-flux, while the corresponding values in the year 2000 were only 50% and 46%, respectively.




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

Global Patient and Centre Numbers	
HD patients	1,380,000
HD centres	25,500
<b>Average number of patients per centre</b>	<b>54</b>



Development of dialyser numbers by membrane type since 2000





The data presented here is derived from information consolidated from 140 countries worldwide.

All data referring to ESRD patients, unless labelled otherwise, refer to the end of year 2006.

Growth rates displayed are the 2005 to 2006 annual growth rates.

All data referring to the European Union (EU) describe the status as in year 2006 (i.e. 25 countries).

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



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