

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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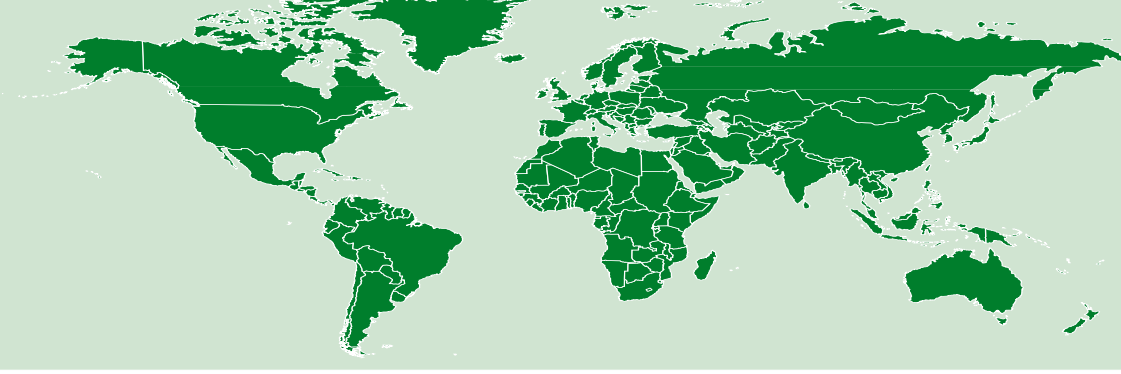
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# **ESRD Patients in 2001**

A Global Perspective



Fresenius Medical Care

# Preface

At the end of the year 2001, the number of people undergoing dialysis exceeded 1.1-million – a number certainly unimaginable in the early days of dialysis just one quarter of a century previously when approximately 80,000 patients underwent this life-sustaining therapy.

Today, the global end-stage renal disease (ESRD) patient population continues to grow at an annual rate of 7%; a growth driven by an aging population, increased incidence of disease associated with renal failure, improved technology and increased access to treatment.

Renal registries and other official bodies in numerous countries present a valuable source of extensive information on various aspects of ESRD demographics, treatment practices and outcomes. Such information provides a base for international comparisons and aids understanding of treatment practices and policies and their implications for the well-being of patients.

Conclusions drawn from such considerations provide knowledge of value to both the medical communities and policy makers throughout the world. However, data collection and analysis of this scope requires extensive resources that may result in a time lapse between data collection and publication.

This global perspective of ESRD patients, prepared from data from 120 countries worldwide contributing to the Fresenius Medical Care Annual Survey, provides a comprehensive overview of ESRD at the end of the year 2001 and as such offers a unique insight into this patient population, global distribution and treatment modalities selected.

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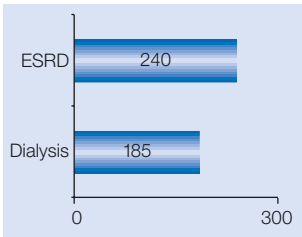
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# Global View of ESRD Patients

<b>ESRD Patients (in 000)</b>	<b>1,479</b>
thereof Tx	338
thereof HD	1,015
thereof PD	126
<b>World Population</b>	<b>6.2 billion</b>

Global number of ESRD patients split by treatment modality



ESRD and dialysis prevalence in patients per million population

Growth Rates	
World population	1.3%
ESRD	7%
HD	7%
PD	5%
Tx	7%

Annual growth rates for ESRD patient population split by treatment modality

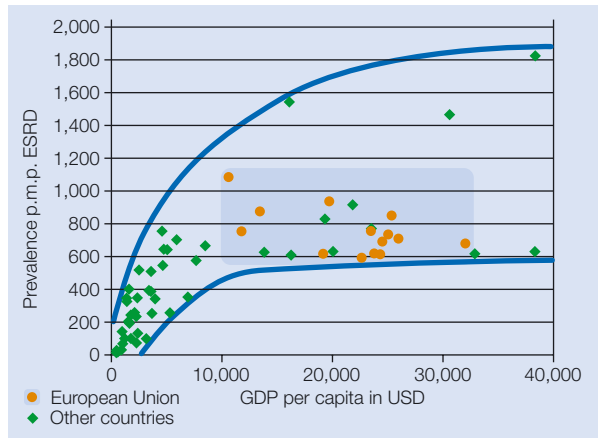
Global ESRD patients were estimated to have reached 1,479,000 at the end of 2001. Of these patients, around 1,141,000 were undergoing dialysis treatment (haemodialysis/HD and peritoneal dialysis/PD) and around 338,000 people were living with donor kidneys (Tx).

Prevalence of treated ESRD patients (patients per million population/p.m.p.) showed a high global variation ranging from less than 100 to more than 1,000. The global average of 240 and 185 for ESRD and dialysis patients respectively suggests that, from the global perspective, access to treatment is still limited and a number of patients with terminal renal failure do not receive treatment.

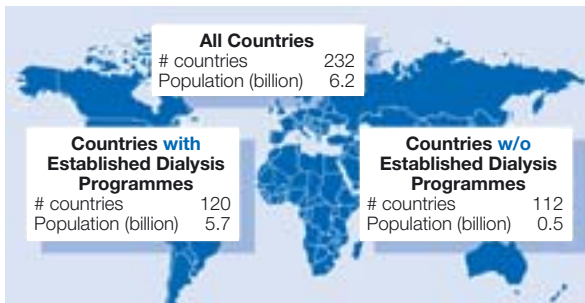
The ESRD population continues to grow at a rate significantly above world population growth. The growth rates presented are based on actual growth reported for 2000 to 2001.

A comparison of national economic strength (expressed as gross domestic product/GDP) with prevalence of ESRD suggests that economic factors may impose restrictions to treatment. An association may be assumed between ESRD patient prevalence and GDP for a country in which the GDP per capita is below a limiting value. Further analysis shows that such a correlation is not evident in the countries of the European Union. Approaches that enable establishment of dialysis programmes in countries with restrictive economic resources may result in future patient numbers significantly in excess of those derived with the currently reported growth rates.

ESRD prevalence and economic welfare in 60 countries representing 97% of the global ESRD patient population



# Countries Reporting Dialysis Patients



Number of countries with and without an established dialysis programme

Of the more than 230 countries (or areas of special sovereignty) worldwide, 120 countries provided dialysis care to patients with renal failure. Thus, approximately 90% of the world population had theoretical access to dialysis treatment.

58% of the global dialysis patient population is treated in just five countries – USA, Japan, Germany, Brazil and Italy – which together account for less than 12% of the world population.

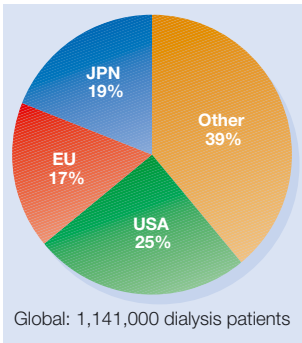
The different prevalence rates evident in these five countries, ranging from 310 p.m.p. in Brazil to 1,730 p.m.p. in Japan, are an indication of the widely varying situation regarding dialysis treatment practices and outcomes within this group of countries.

The next 10 countries ranked by the size of their dialysis patient population account for 21% of the global dialysis patient population while representing 29% of the world population. The remaining 21% of global dialysis patients are treated in more than 100 different countries representing more than 50% of the world population.

Regional concentration of dialysis patients

Countries ranked by dialysis population	Population (million)	% of world population	Dialysis patients (thousand)	% of total dialysis patients	Prevalence
USA	279	4.5%	288	25%	1,030
Japan	127	2.1%	220	19%	1,730
Germany	83	1.3%	54	5%	650
Brazil	175	2.8%	54	5%	310
Italy	58	0.9%	42	4%	730
Countries 6 to 15	1,785	28.8%	243	21%	140
Countries 16 to 120	3,179	51.4%	240	21%	80
Countries 121 to 232	503	8.1%	0	0%	0
<b>Total</b>	<b>6,190</b>		<b>1,141</b>		<b>185</b>

# Global View of Dialysis Patients



Regional distribution of dialysis patients

00/01 Regional Dialysis Growth Rates	
USA	~5%
European Union	~4%
Japan	~5%
Other	~10%
<b>Total</b>	<b>~7%</b>

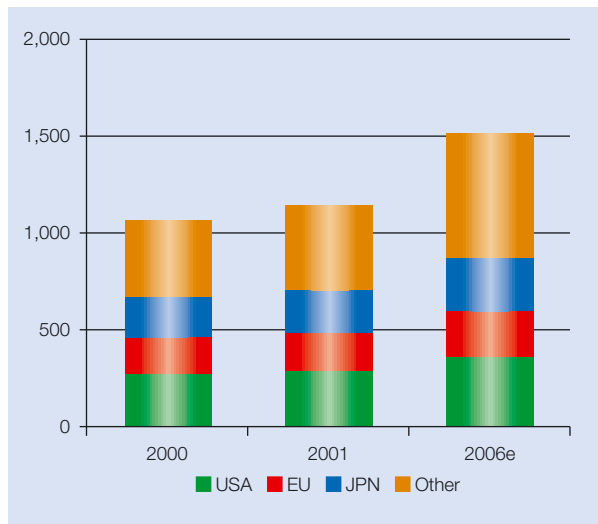
Annual growth rates for dialysis patient population split by geographic region

Globally, dialysis patients can be allocated to three major geographical regions: USA, the European Union and Japan where 61% of all dialysis patients worldwide are treated. The remaining 39% of dialysis patients are distributed throughout different geographical regions such as Asia, Latin America, Eastern Europe, Middle East and Africa (designated "Other").

Comparison of growth rates from 2000 to 2001 demonstrates little variation between USA, Japan and the European Union whereby, in contrast, the dialysis patient prevalence varies significantly; a dialysis patient prevalence of 1,730 p.m.p. is reported for Japan, 1,030 p.m.p. for the USA and 520 p.m.p. for the European Union.

Further, significantly different growth rates between the three major geographical regions and regions such as Asia, Latin America, Eastern Europe, Middle East and Africa are evident. This variation in growth rates may be partially explained by differences in the maturity of dialysis programmes, demographics and available financial resources.

Extrapolation of patient populations based on current growth rates suggests a change in the distribution of patients to the different regions over the next 5 years with a significantly higher proportion of patients potentially undergoing treatment in Asia, Latin America, Eastern Europe, Middle East and Africa.



Expected development of dialysis patient population split by geographic region

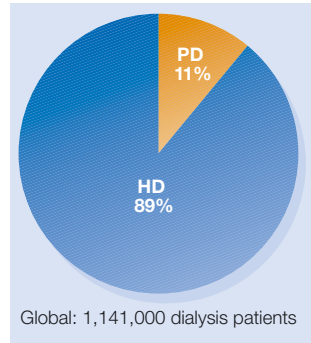
# Global View of Dialysis Patients

At year-end 2001, HD remained the more frequent treatment modality with 1,015,000 patients (89% of all dialysis patients) undergoing haemodialysis and 126,000 patients (11% of all dialysis patients) undergoing peritoneal dialysis.

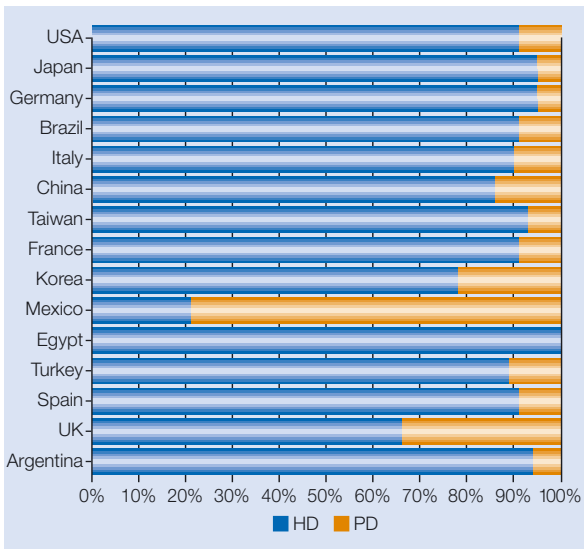
Analysis of the 15 countries with the largest dialysis patient populations indicates that the global HD:PD distribution ratio is not reflected in all countries.

Countries such as the Republic of Korea, Mexico and UK have a significantly higher proportion of PD patients, while countries such as Japan, Germany and Taiwan have a lower proportion of PD patients in comparison to the global average. With the exception of Mexico, HD is the predominant treatment modality in all countries.

Further, the growth rates resulting from consideration of HD and PD populations at year-end 2001 indicate a stronger growth for the HD patient population. Significant differences in the growth rates of different therapy modalities within HD and PD were also evident.



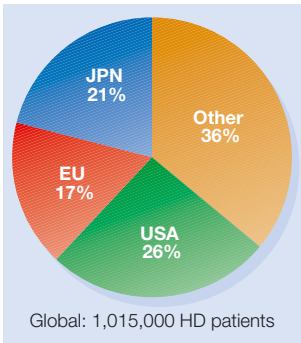
*Dialysis patient population split by treatment modality*



*HD-PD patient split in the 15 largest countries ranked by dialysis patient population*



# Global View of HD Patients



Regional distribution of HD patients

00/01 Regional HD Growth Rates	
USA	6%
European Union	5%
Japan	6%
Other	10%
<b>Total</b>	<b>7%</b>

Annual growth rates for HD patient population split by geographic region

Average Centre Size Global number of ...	
HD patients	1,015,000
HD centres	19,750
Average number of patients per centre	<b>50</b>

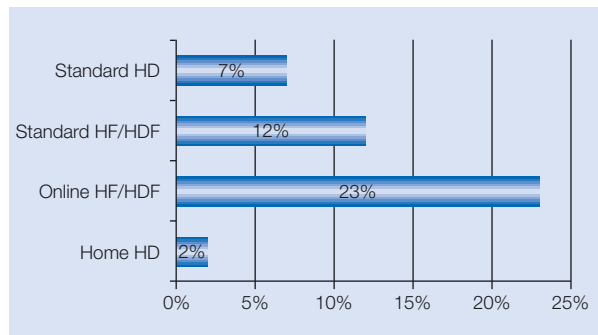
Average number of HD patients per dialysis centre

The global distribution of haemodialysis patients strongly reflects the global dialysis patient distribution previously considered. Growth rates for haemodialysis, however, tend to lie above those for total dialysis in the three major geographical regions with an average growth rate of 6% as opposed to 5% whereas in the remaining regions growth rates for haemodialysis and total dialysis show an average of 10%.

The majority of haemodialysis patients undergo treatment in dialysis centres. At year-end 2001, it was estimated that the 1,015,000 HD patients were treated in 19,750 centres worldwide with an average of 50 patients per centre.

Further global analysis of dialysis centres reveals that 47% of dialysis centres lie within the public sector or belong to healthcare organisations, while the remaining 53% lie within the private sector. Large geographical variations are evident with, for example, more than 98% of centres within the private sector in the USA (private nephrologists and company providers) and more than 60% public and health care organisation centres in the European Union.

An analysis of the different haemodialysis treatment modalities selected in 2001 showed that, although the majority of patients were treated with standard haemodialysis (low- and high-flux), highest growth rates were registered for the high convective treatment modalities with online preparation of substitution fluid (online HF/HDF). Notably only a relatively small patient population is treated with such modalities. Treatment of HD patients in the home environment remained below 1% of the population, the least frequent HD modality, and showed a growth rate below that of the total HD patient population.



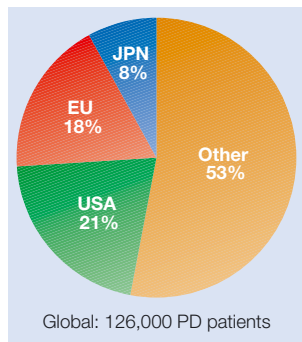
Annual growth rates for HD patient population split by treatment modality

# Global View of PD Patients

An analysis of global peritoneal dialysis patients indicates a regional shift in the patient distribution from Japan to further countries in Asia and Latin America. This may be considered a result of the low penetration of peritoneal dialysis in Japan, where approximately 5% of patients undergo this treatment modality, and from the relatively high penetration of this treatment modality in some countries in Latin America and Asia. As previously considered, large PD patient populations, relevant to HD, are to be found in Mexico and the Republic of Korea.

Peritoneal dialysis growth rates in 2001 were with an average of 5% below those of haemodialysis. As with HD, significantly higher growth rates were observed in Asia, Latin America, Eastern Europe, Middle East and Africa (region "Other") relative to the three major single geographical regions.

Growth in peritoneal dialysis was driven by automated peritoneal dialysis (APD) modalities that, although selected for only 25% of global PD patients, showed a 10% increase in 2001 compared to a 3% increase for continuous ambulatory peritoneal dialysis (CAPD) modalities. Again strong variations in the allocation of patients to either CAPD or APD are evident with as many as 30 to more than 50% of patients undergoing APD in some countries.



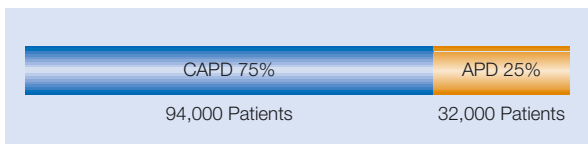
Regional distribution of PD patients

00/01 Regional PD Growth Rates	
USA	-2%
European Union	+1%
Japan	-1%
Other	10%
<b>Total</b>	<b>5%</b>

Annual growth rates for PD patient population split by geographic region

00/01 PD System Growth Rates	
CAPD	3%
APD	10%
<b>Total</b>	<b>5%</b>

Annual growth rates for PD patient population split by treatment modality



PD patient population split by treatment modality

The data presented is derived from information consolidated from 120 countries worldwide.

All data referring to ESRD patients, unless labelled otherwise, refer to year-end 2001. Growth rates display 2000/2001 annual growth.

The majority of official renal registries do not publish data of such recent nature thus the data contained herewith has been put forth by professionals in the field of dialysis in each of the 120 countries considered.