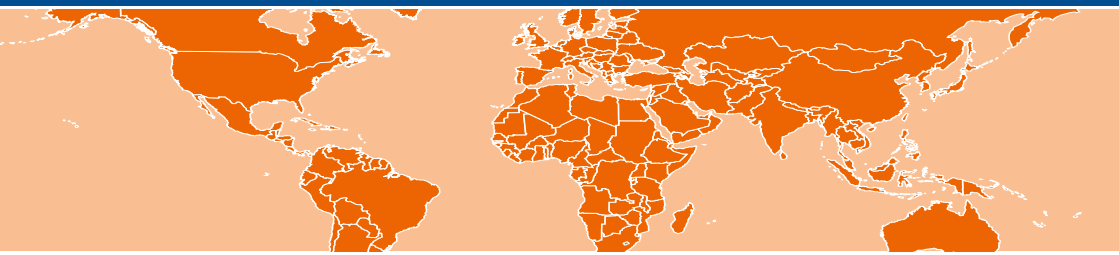


ESRD Patients in 2013

A Global Perspective

FRESENIUS MEDICAL CARE

Contents

Preface

The information presented here on global end-stage renal disease (ESRD) demographics and selected trends was retrieved in the 2013 global Fresenius Medical Care market survey. Of the around 240 countries (or areas of special sovereignty) worldwide, 150 countries are reported to provide dialysis care to patients with renal failure. The annual Fresenius Medical Care market 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 several 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alone, as a significant portion of the countries that provide dialysis care do not have official renal registries or do not publish corresponding data.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

ESRD Patients	3,200,000
thereof HD	2,250,000
thereof PD	272,000
thereof Tx	678,000
World Population	**7.1 billion**

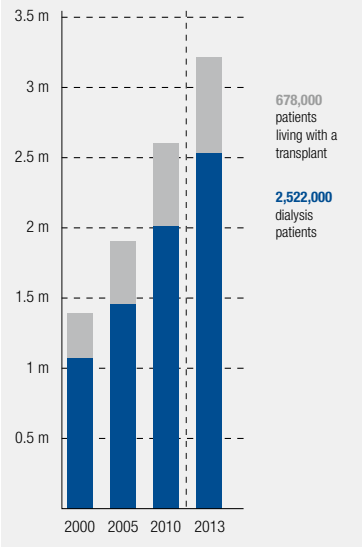
Annual Growth Rates	
World population	1.1%
ESRD	~6%
HD	6–7%
PD	~8%
Tx	4–5%

The number of patients being treated for ESRD globally was estimated to be 3,200,000 at the end of 2013 and, with a ~6% growth rate, continues to increase at a significantly higher rate than the world population.

Of these 3,200,000 ESRD patients, approximately 2,522,000 were undergoing dialysis treatment (haemodialysis (HD) or peritoneal dialysis (PD)) and around 678,000 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.

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 highest in Taiwan with

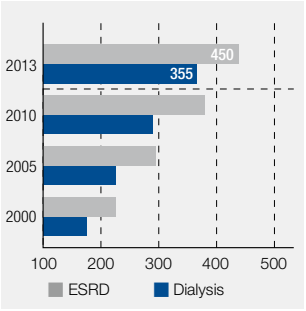


Development of ESRD patient numbers since 2000

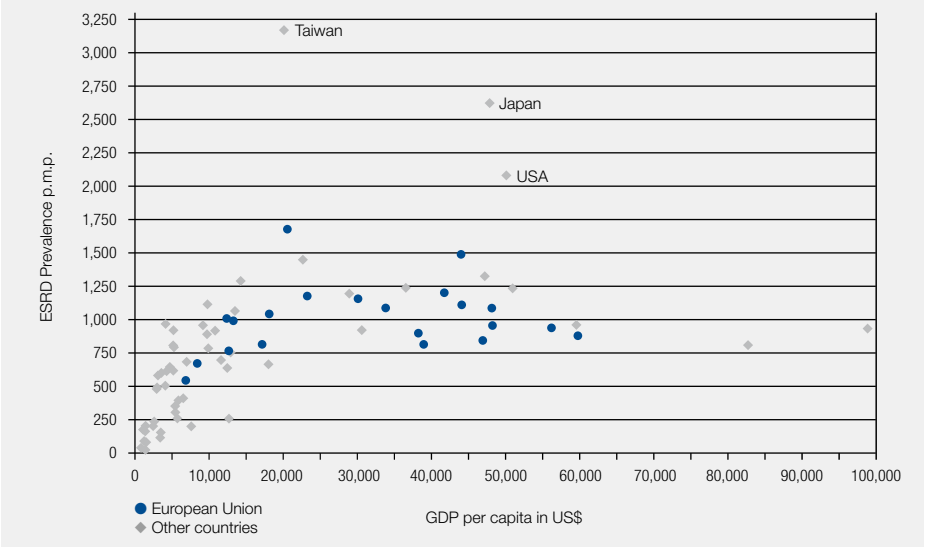
around 3,170 p.m.p., followed by Japan with around 2,620 p.m.p. and then the USA with around 2,080 p.m.p. It averages about 1,090 p.m.p. in the 28 countries that make up the European Union (EU). The much lower global average of 450 p.m.p. suggests that, from the global perspective, access to treatment 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 general increase in the numbers of people requiring care for ESRD as well as a gradual improvement in the access to the treatment.

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 US$ 10,000 per person per year.

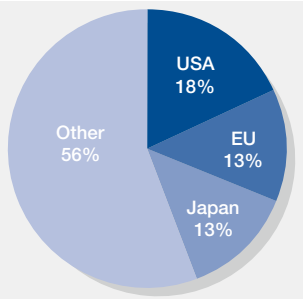
Development of global ESRD and dialysis prevalence values since 2000 (patients per million population)



2013 prevalence of ESRD patients



Global View of Dialysis Patients



Global: 2,522,000 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. Around 44% of all dialysis patients are treated in these 30 countries.

In fact, more than 50% of the global dialysis patient population is treated in just five countries – the USA, China, Japan, Brazil and Mexico. The different values for the prevalence of dialysis in the five countries with the largest dialysis patient populations, ranging from as little as 245 in China to 2,505 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 25% of global dialysis patients are treated in around 135 different countries representing around 43% of the world population (i. e. countries 16–150).

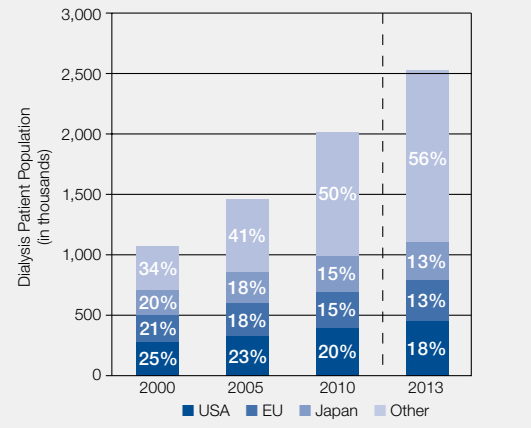
Regional distribution of dialysis patients compared to the general population

Countries ranked by dialysis population	Population (million)	% of world population	Dialysis patients (thousand)	% of total dialysis patients	Prevalence of dialysis (p.m.p.)
United States	318	4%	452	18%	1,420
China	1,352	19%	330	13%	245
Japan	126	2%	315	12%	2,505
Brazil	201	3%	116	5%	575
Mexico	117	2%	96	4%	820
Countries 6–15	1,769	25%	576	23%	325
Countries 16–150	3,039	43%	637	25%	210
Countries 151–240	186	2%			
Global	**7,108**		**2,522**		**355**

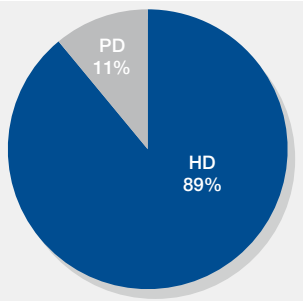
In the USA, Japan and the European Union, dialysis patient population growth rates between 2012 and 2013 were in a range of 1–4% and, as such, were significantly lower than growth rates in regions such as Asia, Latin America, the Middle East and Africa. This variation in growth rates may be partially explained by differences in demographics and the maturity of dialysis programmes, i. e. an increasing access to dialysis programmes in developing countries.

Extrapolation of patient populations based on current growth rates suggests an ongoing trend towards a change in the regional distribution of patients: a significantly higher proportion of patients will undergo dialysis treatment in Asia, Latin America, Eastern Europe, the Middle East and Africa in the future. This trend becomes particularly clear when present data is compared with corresponding data from the year 2000, 2005 and 2010.

Annual Regional Dialysis Population Growth Rates	
USA	3–4%
European Union	~2%
Japan	1–2%
Other	10–11%
Total	**6–7%**



Development of dialysis patient population split by geographical region

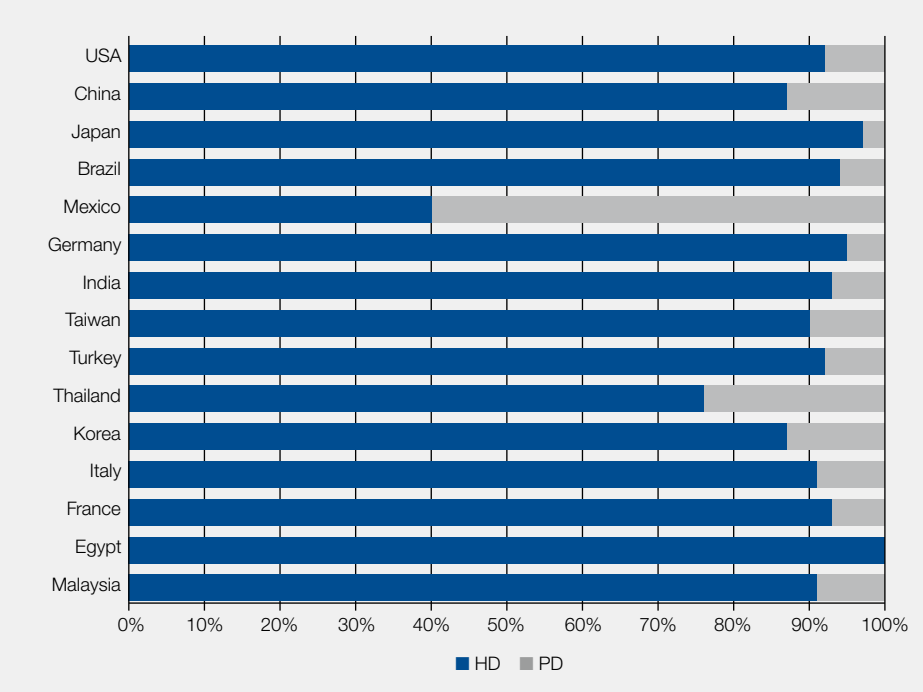


Global: 2,522,000 dialysis patients

At the end of year 2013, haemodialysis remained the most common treatment modality, with approximately 2,250,000 patients undergoing haemodialysis (89% of all dialysis patients) and around 272,000 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 and Thailand have a significantly higher proportion of PD patients, while Japan, Germany and Egypt have 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

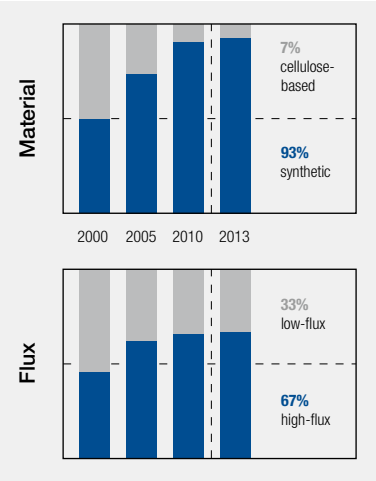


Global View of Haemodialysis Patients

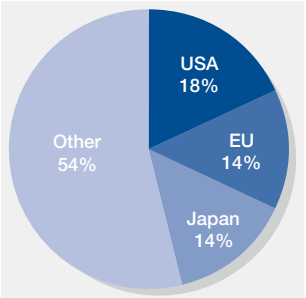
The global distribution and growth rate of haemodialysis patients strongly reflect the global distribution and growth rate of dialysis patients in general.

Most haemodialysis patients undergo treatment in dialysis centres. At the end of year 2013, it was estimated that the great majority of the 2,250,000 patients were treated in 35,000 centres worldwide with an average of 64 patients per centre. Further analysis reveals that ~40% of dialysis centres lie within the public sector or belong to healthcare organisations, while the remaining ~60% 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 44% are so in the European Union.

Analysis of the different dialyser types selected for the treatment of haemodialysis patients in 2013 and comparison with previous years showed a prevailing trend towards synthetic dialysis membranes and high-flux dialysers. Of all dialysers now utilised, around 93% contain a synthetic membrane and around 67% are high-flux, while the corresponding values in the year 2000 were only 50% and 46%, respectively.



Development of dialyser numbers by membrane type since 2000

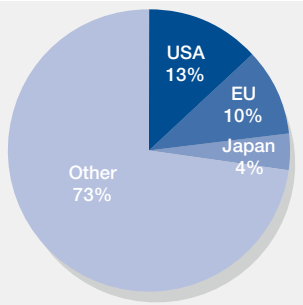


Global: 2,250,000 HD patients

Annual Regional HD Population Growth Rates	
USA	3–4%
European Union	~2%
Japan	1–2%
Other	10–11%
Total	**6–7%**

Global Patient and Centre Numbers	
HD patients	2,250,000
HD centres	35,000
Average number of patients per centre	**64**

Global View of Peritoneal Dialysis Patients



Global: 272,000 PD patients

Annual Regional PD Population Growth Rates	
USA	~6%
European Union	0–1%
Japan	~-4%
Other	10–11%
Total	**~8%**

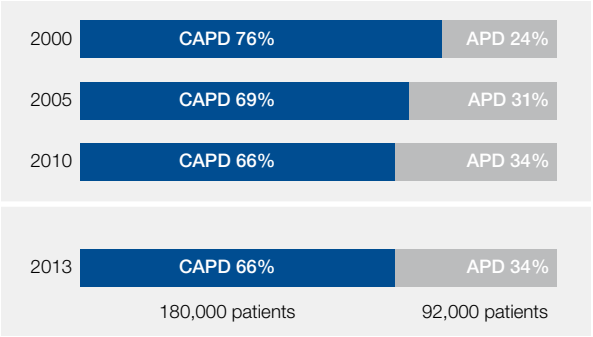
Annual PD System Growth Rates	
CAPD	~9%
APD	6–7%
Total	**~8%**

The regional distribution of peritoneal dialysis patients differs from both, HD patient share as well as dialysis patient share in general.

In contrast to some Asian as well as some Latin American countries, where peritoneal dialysis is relatively popular, in Japan only about 3–4% of the dialysis patients are treated with this treatment modality.

There has been a wide variation in regional growth rates for peritoneal dialysis in 2013. While in Japan the number of patients receiving PD treatment declined by ~4%, in the EU it was stable and USA showed a growth of 6%. However, this was still considerably lower than the average of the remaining countries worldwide with around 10–11% growth.

With an average of ~8%, growth rates in 2013 were slightly higher than the corresponding haemodialysis growth rates. Growth in peritoneal dialysis, this year was slightly lower in automated peritoneal dialysis (APD). Use of this modality increased by 6–7% compared to a ~9% increase for continuous ambulatory peritoneal dialysis (CAPD). 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.



Comparison of CAPD and APD patients numbers since 2000

The data presented here is derived from information consolidated from 150 countries worldwide.

All data referring to ESRD patients, unless labelled otherwise, refer to the end of year 2013.

Growth rates displayed are the 2012 to 2013 annual growth rates.

All data referring to the European Union (EU) describe the status as in year 2013 (i. e. 28 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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