Chapter XI

International Comparisons of ESRD Therapy

Over the last decade a growing number of national and regional registries dealing with treated ESRD patients have been created. The existence of these registries allows an international comparison of incidence and prevalence rates, and a description of differences in the use of the various treatment modalities for patients treated for ESRD. The USRDS covers 93 percent of all patients treated for ESRD in the United States through mandatory counts of patients whose treatment is paid for by Medicare (see Chapter II). Several registries are equally or more complete (D'Amico 1995), many others are based on voluntary submission of data and are therefore less complete.

The international data in this chapter are based on reports from the following ESRD patient registries: the Australian and New Zealand Dialysis and Transplant Registry (ANZDATA), the Canadian Organ Replacement Register (CORR), the European Dialysis and Transplant Association (EDTA) Registry, and the registry of the Japanese Society of Dialysis therapy.

Treated ESRD Incidence Rate for Selected Countries, 1984-1993

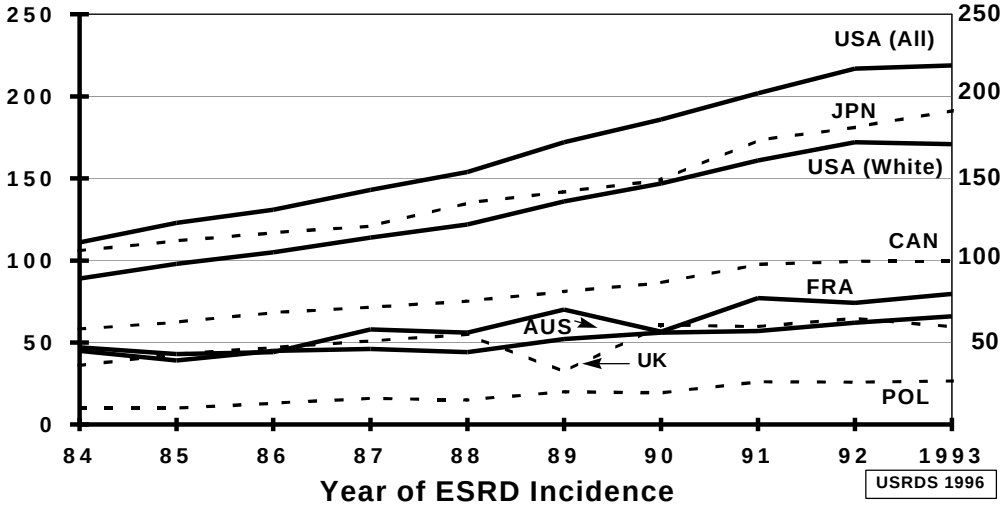

Figure XI -1

Treated ESRD incidence rates per million population (unadjusted) for Australia, Canada, selected European countries, Japan (dialysis patients only), and the U.S. (total and White Medicare patients only) for 1984-1993.

Treated ESRD Prevalence Rates (Unadjusted) per Million Population for Selected Countries, 1993

Country	Code	Prevalence Counts (n)	Rate PMP[1]
Japan[2]	JPN	134,298	1076
U.S.A.	USA	220,076	802
Spain	SPA	23,342	571
Canada	CAN	15,413	518
Sweden	SWE	4,934	509
Israel	ISR	2,692	476
Netherlands	NL	7,251	444
Austria	ÖST	3,402	440
France	FRA	30,676	409
Australia	AUS	7,546	403
West Germany	FRG	24,359	387
United Kingdom	UK	24,238	382
Italy	ITA	26,877	305
Czechoslovakia	CZE	3,881	159
Poland	POL	3,703	93

[1] Patients per million population

[2] Dialysis Patients only

Table XI-1

Incidence and Prevalence

During 1993 the number of patients registered as starting ESRD therapy per year was higher than in 1992 for all registries. Treated ESRD incidence rates (counts of new patients per million population) by year are shown in Figure XI-1. The patterns in growth were somewhat variable by country, although the percent increase per year was more similar than may be apparent in this figure, since the lines were almost parallel on a semi-logarithmic plot (Port 1995).

The United States and Japan have the highest

Percent of Prevalent Dialysis Patients Receiving CAPD or CCPD for Selected Countries, 1993

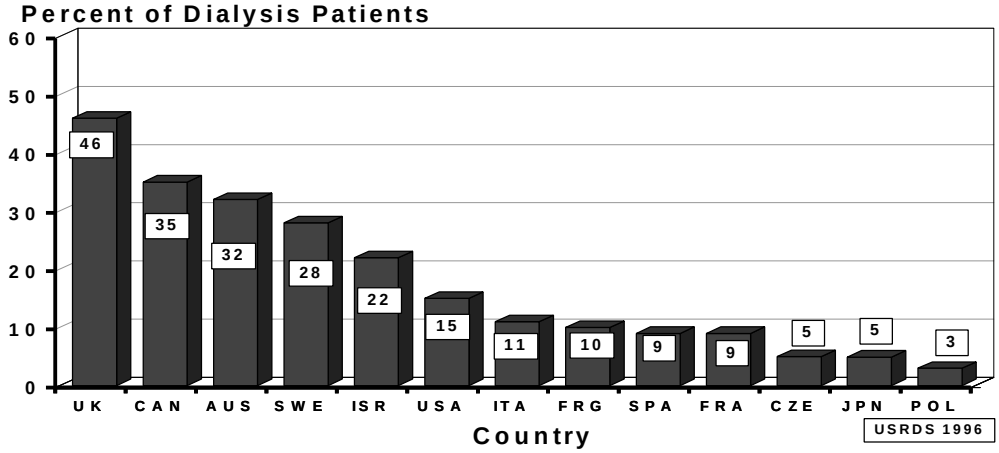

Figure XI-2

Percentage of all prevalent dialysis patients being treated with CAPD or CCPD in Australia, Canada, selected European countries, Japan, and in the U.S. on December 31, 1993. See table XI-1 for Country Codes.

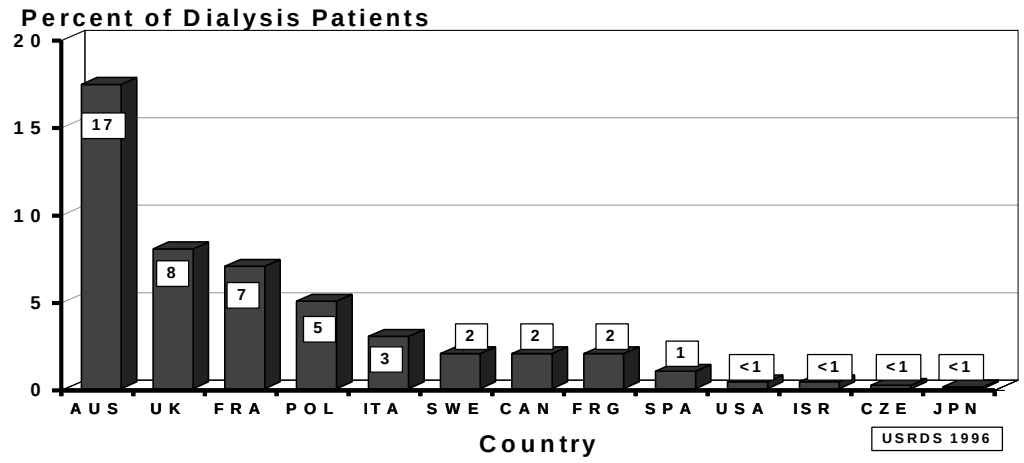

Figure XI-3

Percentage of all prevalent dialysis patients being treated with home hemodialysis in Australia, Canada, selected European countries, Japan and in the U.S. on December 31, 1993. The value for Canada now excludes self care hemodialysis patients (8.3 percent of prevalent dialysis patients in 1993). In previous USRDS Annual Data Reports, Canadian self care patients had been classified as home hemodialysis patients. See table XI-1 for Country Codes.

incidence rates of treated ESRD per million population. Canada had the next highest rate, which was by comparison approximately half as high as the overall figures for the United States in 1993. Incidence rates in European countries were lower. For better comparison with European countries, the United States incidence rates are shown not only for the total but also for the White-only (mostly of European descent) sub-population. These rates are not adjusted for international differences in age distributions. In the United States, the median age among new patients has increased from 55 years in 1980 to 63 years in 1993. Other countries have also had dramatic increases in median age (USRDS 1995). Treated ESRD incidence rates by country likely depend on differing acceptance practices for older patients and those with severe comorbid conditions such as diabetes.

The prevalence counts of ESRD patients alive and registered on therapy as of December 31, 1993 are described for selected countries in Table XI-1. This table also lists the point prevalence rates for treated ESRD patients per million population. Since these statistics include registered patients only, they reflect undercounts of the true patient populations in many registries. In Japan incidence rates were lower and point prevalence rates higher for treated ESRD as compared to corresponding numbers in the U.S. This observation suggests a better survival among Japanese ESRD patients, as has been reported in two previous studies (Held 1990; Held 1994).

Dialysis Modalities

The utilization of ESRD treatment modalities varies widely by country. CAPD and CCPD have become the most commonly used form of home dialysis. Figure XI-2 shows the percent of all prevalent dialysis patients treated by CAPD or CCPD on December 31, 1993 for selected countries in the order of highest to lowest percentage utilization. Figure XI-3 similarly describes patients on home hemodialysis as a percentage of all dialysis patients in decreasing order for selected countries. Note that the scale is less than half that used in Figure XI-2. Australia and the United Kingdom continue to be the countries with the greatest proportion of patients treated with home hemodialysis (17 and 8 percent respectively); however, even in these countries, the proportion of dialysis patients using this modality has declined considerably since 1984 (Figure XI-4). Figure XI-5 shows that the utilization of CAPD/CCPD increased in all the selected countries 1984 to 1993.

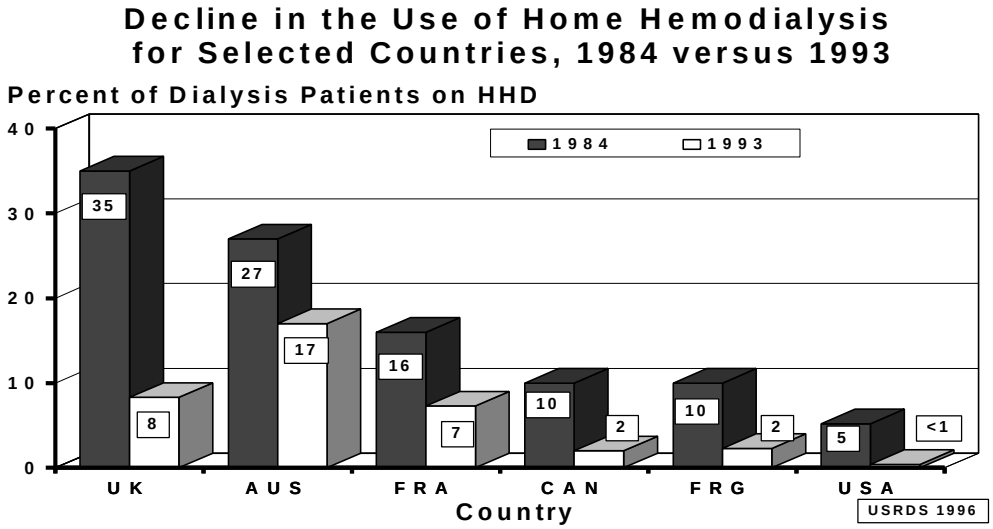

Figure XI-4

Percentage of total dialysis patients treated with home hemodialysis for Australia, Canada, selected European countries, Japan, and in the U.S. in 1984 and 1993. Only in Australia did the absolute count of home hemodialysis patients increase between 1984 and 1993. See table XI-1 for Country Codes.

Home dialysis therapies (home hemodialysis and CAPD/CCPD) account for 54 percent of all dialysis in the United Kingdom, for 49 percent in Australia and for 38 percent in Canada as compared to 16 percent in the U.S. and less than 9 percent in Poland and Czechoslovakia. Continuous peritoneal dialysis is by far the predominant mode of home dialysis therapy, except in France, where both modalities are used at almost the same frequency. Reasons for these differences in the approach to ESRD treatment modalities have been discussed recently (Nissenson).

Utilization of Transplantation

Although there has been a trend towards transplanting older patients (see Chapter VII), a small fraction are currently transplanted. Therefore, countries with higher proportions of older patients

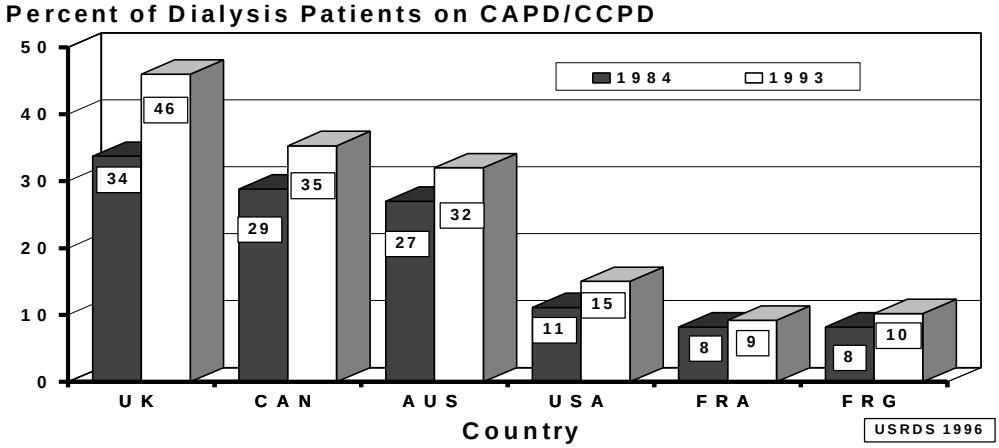

Figure XI-5

Percentage of total dialysis patients treated with CAPD or CCPD for Australia, Canada, selected European countries, Japan, and in the U.S. on December 31, 1984 and 1993 (Australian data for October 31, 1984). See table XI-1 for Country Codes.

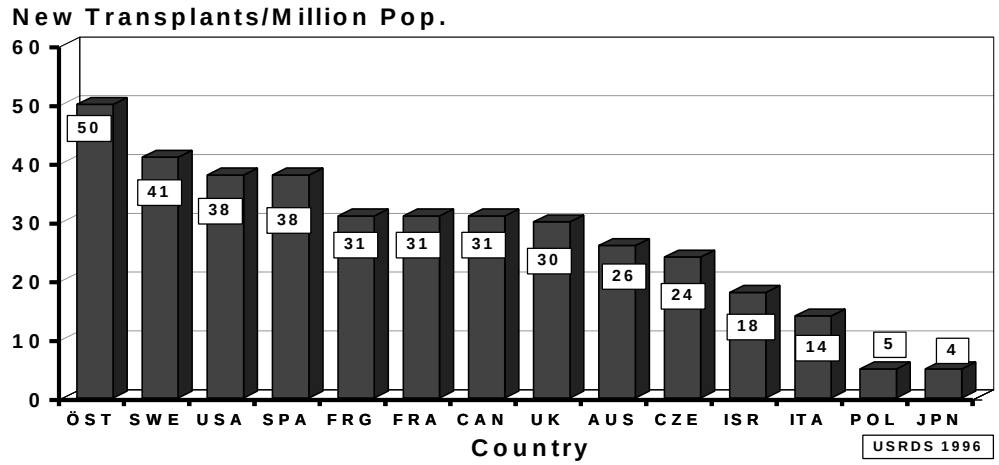

Figure XI-6

Transplantation rate (count of new renal transplants per million total population) in Australia, Canada, selected European countries, Japan, and in the U.S. during 1993. See table XI-1 for Country Codes.

would be expected to have a lower fraction of ESRD patients transplanted. To avoid the problem of variable acceptance of older patients for ESRD therapy, this report uses the general population as the denominator (Webb).

Figure XI-6 shows the transplantation rate as the number of patients receiving a renal transplant during 1993 per million total population for selected countries. Austria, Sweden, the United States, and Spain have the highest transplantation rates while Italy, Poland and Japan have low reported transplantation rates. Austria and Spain have been particularly successful at increasing their rates of transplantation, the reported rates have more than doubled in both countries since 1982. For Austria this dramatic increase may be related to an assumed consent law for cadaveric organ donation.

The results of a separate analysis assessing the percent of ESRD patients with functioning grafts on December 31, 1993, are shown in Figure XI-7 for selected countries. The rank order of countries in Figure XI-7 differs from that in Figure XI-6. The transplantation rates reflect in part the transplantation activity during 1993, while the fraction of ESRD patients with a functioning transplant indicates both the transplantation activity over several years and the graft survival. It is also possible that there may be an undercount of long-term survivors with a functioning renal transplant in certain countries.

Patient Survival

In a recent study, Held and coworkers compared survival among U.S. and Japanese dialysis patients and also reported the results for all ESRD patients combined (Held 1994). When the percentage of patients surviving was converted to a relative risk of death, the risk was more than two fold greater for corresponding U.S. dialysis patients in the adult age groups studied (45 - 54 and 55 - 64 years), both among male and female diabetic and nondiabetic patients. The results were overall similar when all ESRD patients (dialysis and transplant combined) were considered.

In another international comparison, five-year mortality rates were evaluated for all ESRD patients (combining dialysis *and* transplant patients), analyzing diabetic patients separately from nondiabetic patients and using many separate age categories. This analysis showed that the probability of survival in the United States was greater in pediatric patients and lower in patients over 24 years of age when compared to corresponding findings from the EDTA and the Japanese registries (Held 1990). These observations are striking because a relatively high fraction of U.S. patients receives a renal transplant which should lead to superior results (Port 1993). However, contrary to a recent report in the *New York Times* newspaper (Eichenwald), neither

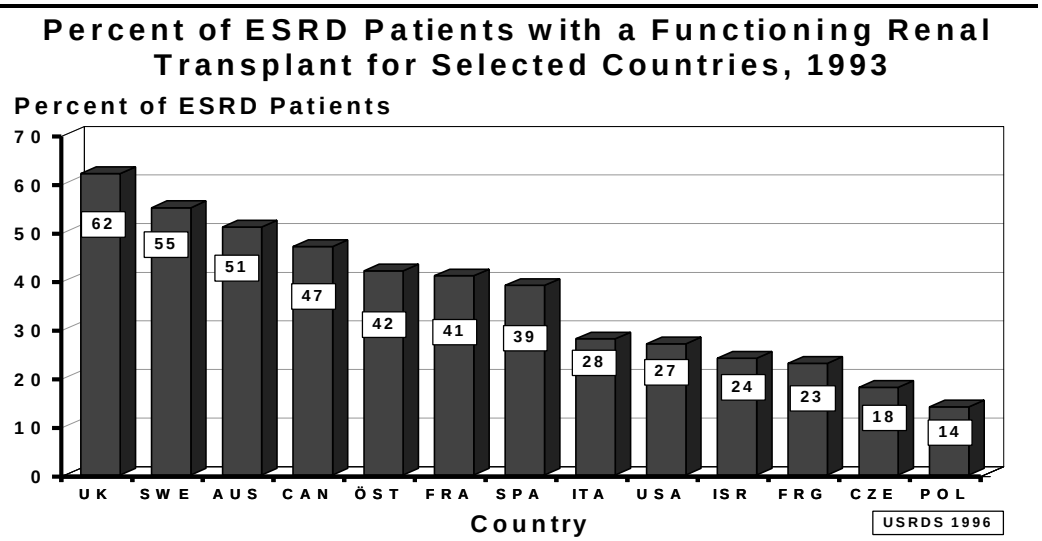

Figure XI-7

Percentage of all patients with treated ESRD with a functioning renal transplant on December 31, 1993 for Australia, Canada, selected European countries, Japan, and in the U.S. See table XI-1 for Country Codes.

of these analyses were adjusted for severity of illness. The analyses were adjusted for age, sex, and diabetes but not for other risk factors or comorbid conditions which influence patient survival. Additionally, if the completeness of ascertainment of deaths in ESRD patients varied by country or region, the reliability of these comparisons could be questioned.

Since large differences exist between countries in the utilization of treatment modalities and in the acceptance of patients, particularly for diabetics and older age groups, it is difficult to interpret such observed differences in mortality rates (Kjellstrand 1994). It is possible to attempt to adjust statistically for such differences in patient characteristics and comorbid conditions as in the recent CANUSA study. This study compared the survival of CAPD patients treated in 4 selected centers in the US with 10 centers in Canada (Canada-USA). The risk of death, after adjustment for age, sex, race and comorbid conditions, was 93-95 percent higher in the US centers. Similar statistical adjustment for patient characteristics and comorbid conditions was used in a study comparing patient survival between patients with treated ESRD in the USRDS and Lombardy Dialysis and Transplant Registry (Marcelli). In this study it was found that, although the lower mortality risk observed in the Italian patients was less pronounced when adjusted for demographic and comorbid factors, the adjusted mortality risk in Lombardy was still 29 percent lower than for US patients.

Future international comparative studies of survival will require a similar multivariate analysis with adjustment for patient characteristics, known risk factors and comorbid conditions. The accuracy of such adjustment is fundamentally dependent on the quality and uniformity of the data collected. There is increasing information about what data need to be gathered in order to predict mortality among dialysis patients (Wolfe 1995). Future studies of this type will mandate prospective data collection with close participation between collaborating registries.

Important insights have already been learned from international comparisons of different health care systems (Held 1990, Nissenson 1993) and health care delivery (Held 1992). More could be learned from future comparative studies of different approaches, health systems, and ESRD prescriptions.

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