

AVAILABILITY OF RENAL REPLACEMENT THERAPY IN CENTRAL AND EASTERN EUROPE

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During the past 15 years, deep political and economic changes have occurred in Central and Eastern Europe (CEE). New, independent countries have appeared on the map because of the partition of the former Soviet Union and the former Yugoslavia and Czechoslovakia. One significant area of change in the CEE region has been intensive reform of the healthcare systems in each country. In particular, renal replacement therapy (RRT) in most of these countries was underdeveloped during the so-called "real" socialism era. But enormous effort on the part of the nephrology communities, supported by the economic help of local, regional, and central authorities, has resulted in gradual progress in this matter. Both main RRT modalities (dialysis and renal transplantation) have evolved simultaneously in most of these countries but not always equally. In most CEE countries, RRT is available for all patients with end-stage renal disease. Still, an unsatisfactory level of RRT availability, despite the efforts of the nephrology community, continues to be a concern in Belorussia and Russia, where additional support from the healthcare system is required. The lowest rates of RRT are found in Albania, Moldova, and Ukraine, but reliable data from these countries are lacking. (*Ethn Dis.* 2009;19[Suppl 1]:S1-18–S1-22)

Key Words: Renal Replacement Therapy, Epidemiology

INTRODUCTION

It has now been almost 20 years since the Communist Party was overthrown in Poland, which led to the dissolution of the Soviet Bloc and brought about many changes in Central and Eastern Europe (CEE). New, independent countries appeared on the map of CEE because of the disintegration of the Soviet Union and Yugoslavia. Other countries regained full sovereignty and independence and initiated economic changes connected to the introduction of a free-market economy. Economic and social reforms went hand in hand with deep changes in the healthcare system. In most countries in the CEE region, renal replacement therapy (RRT) was underdeveloped during the socialist era,^{1–6} but enormous efforts on the part of nephrology communities, supported by financial help from local, regional, and central authorities, has resulted in progressive improvement in end-stage renal disease (ESRD) care. These changes have been described previously.^{2,4,7–9} The aim of the present study is to show the changes in RRT since 1996.

SUBJECTS AND METHODS

Data presented in this study were mainly collected from independent surveys performed in 1996, 1999, 2002, and 2006. Special questionnaires were completed by the members of the CEE Advisory Board in Chronic Renal Failure or persons involved in national renal registries. Some of the information was corrected or validated by using recent reports published by national renal registries^{10–16} or the European Renal Association–European Dialysis and Transplant Association (ERA-EDTA) Registry.¹⁷ Analysis is based on data collected from 16 countries: Bosnia and Hercegovina, Bulgaria, Be-

lorussia, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Macedonia, Poland, Romania, Russia, Serbia and Montenegro, Slovakia, and Slovenia. Reliable data are unavailable from Albania, Moldova, and Ukraine.

RESULTS AND DISCUSSION

Prevalence of RRT

The availability of RRT is compared in CEE countries from 1990 through 2004 in Table 1. During this period, the population of all CEE countries remained fairly static. Nevertheless, in every country progress in the availability of RRT was noted. In countries with well-developed RRT systems, like Croatia or Slovenia, the number of patients almost doubled and reached a level observed in developed Western European countries. The next group of countries, including the Czech Republic, Hungary, and Slovakia, experienced a 3-fold increase of patients during this period. In the last group, that is, countries with poor availability of RRT in 1990, the number of treated patients rose by a factor of 5 (Poland) to 20 (Romania). Nevertheless, only in half of the CEE countries is the number of RRT patients per million population (pmp) >400. Analyzing the situation in other countries, we see that Bulgaria achieved borderline values, while the situation in the Baltic countries (Estonia, Latvia, and Lithuania) and Romania looks promising. As in the past, Belorussia and Russia continue to have the worst availability of RRT, although they have made real progress.⁹

Dialysis vs Renal Transplantation

The main changes were noted in the development of dialysis therapy. This is well evidenced in the second part of

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Table 1. Availability of renal replacement therapy in Central and Eastern Europe, 1990 and 2004

Country	Population (Million)		Renal Replacement Therapy				Dialysis Therapy				Percentage of Diabetic Patients	
			Total		pmp		Total		pmp			
			1990	2004	1990	2004	1990	2004	1990	2004	1990	2004
Bosnia and Hercegovina	NA	7.76	NA	1863	NA	551	NA	1717	NA	448	NA	10.5
Bulgaria	8.4	7.76	1507	3037	194	391	1141	2637	147	340	7.4	10.7
Belorussia	10.0	10.32	312	1379	30	134	235	1243	23	120	6.5	7.0
Croatia	4.3	4.44	2153	3582	485	807	1487	2899	335	653	9.5	16.5
Czech Republic	10.2	10.22	2268	7743	223	758	1331	4504	130	441	31.0	32.0
Estonia	1.5	1.35	137	461	101	341	30	202	22	150	10.0	21.0
Hungary	10.6	9.98	1212	5107	121	512	962	3700	96	371	7.4	10.0
Latvia	2.5	2.31	261	722	113	313	78	379	34	164	12.0	11.1
Lithuania	3.8	3.39	194	1477	57	436	61	1089	18	321	14.0	17.6
Macedonia	2.1	2.04	969*	1108	475*	543	897*	1000	440*	490	11.3	7.9
Poland	38.6	38.12	3696	17,448	97	458	2340	12,443	61	326	11.7	21.8
Romania	22.8	21.68	330	6022	15	278	310	5311	14	245	8.3	18.3
Russia	148.3	144.17	7899*	14,720	55*	102	6075*	11,394	42*	79	2.0	5.0
Serbia and Montenegro	10.5	8.83	3300	2700	374	306	3020	2504	342	284	10.0	9.7
Slovakia	5.4	5.38	737	1586	137	295	694	1553	129	289	11.0	24.5
Slovenia	2.1	1.01	862	1736	429	864	695	1011	346	503	11.0	14.8

NA = not available, pmp = per million population.

* Data from 1998, the first year reliable and complete data were available.

Table 1. Consistent with previous observations, the dialysis population increased in most of the countries.⁹ However, at least a 2-fold increase in renal transplantations was achieved (Table 2). The best access to this form of RRT was seen in Slovenia and the Czech Republic; the Baltic countries, Hungary, and Poland also showed large increases. Unfortunately, in half of the countries analyzed, the development of renal transplantation is unsatisfactory. The worst availability of this mode of RRT is in Slovakia, Belorussia, Russia, and Serbia and Montenegro. Surprisingly, Russia showed a decrease in transplant numbers during the observed period. Most often renal grafts were from cadaveric donors; nevertheless, countries like Bosnia and Hercegovina, Macedonia, and Serbia and Montenegro had predominantly living donor programs. This is largely due to custom or religious practices. The results of renal transplantation in the CEE region were not analyzed; however, with the use of modern immunosuppressants, graft and patient outcomes are comparable to international results.¹⁸

Incidence Rate

The incidence rate of patients starting treatment during 1 year is a better measure of RRT availability than is the

prevalence rate. Progress achieved in this coefficient is shown in Figure 1. In 9 out of 16 CEE countries, the incidence rate is >100 pmp, and in another 4 it is

Table 2. Renal transplantation in Central and Eastern European countries, 1990 and 2004

Country	Patients Living with Functioning Kidney Graft				Number of Renal Transplants 2004	Percentage of Renal Transplantations From Living Donors, 2004
	Total		pmp			
	1990	2004	1990	2004		
Bosnia and Hercegovina	NA	146	NA	38.1	27	92.6%
Bulgaria	366	400	47.2	51.5	37	NA
Belorussia	77	136	7.5	13.2	15	NA
Croatia	675	683	152	154	117	6.0%
Czech Republic	937	3239	92	317	425	8.9%
Estonia	107	259	79	192	40	2.5%
Hungary	250	1364	25	137	296	NA
Latvia	183	343	79	148	61	0
Lithuania	133	388	39	114	73	NA
Macedonia	72*	108	35	53	17	100%
Poland	1356	5005	36	135	1067	2.5%
Romania	20	711	0.9	33	95	NA
Russia	5319*	3326	37	23	286	27.6%
Serbia and Montenegro	280	196	-	22	38	86.8%
Slovakia	43	33	8	6.1	21	9.5%
Slovenia	167	725	83	360	55	0

NA = not available, pmp = per million population.

* Data from 1998, the first year reliable and complete data were available.

84–90 pmp. Developed countries like the United Kingdom, Finland, the Netherlands, and Norway have approximately the same rates.^{17–19} As in most countries of the developed world, diabetic nephropathy has gradually overtaken other causes of ESRD. Table 1 shows that patients with diabetic nephropathy increased significantly during the analyzed period. In the Czech Republic and Poland, diabetic nephropathy is the most frequent cause of ESRD.^{12,17,20,21} Generally, dialysis patients are getting older, and the criteria for accepting older patients for RRT have changed dramatically, which could be another reason why the incident dialysis population is on the rise.^{7,20} A good example is Poland, where according to the most recent reports, nearly half (49.2%) of patients starting RRT in 2004 were aged ≥ 65 years.²⁰

Reimbursement Rate and Privatization of Dialysis

Expansion of dialysis rates is largely dependent on reimbursement policies and the availability of revenue. Reimbursement rates in selected countries in CEE and Western Europe are compared in Table 3. Countries with the highest expansion of RRT rates also showed increment and better reimbursement rates.^{22,23} Slovenia has the highest reimbursement rate, whereas it is lowest in Belorussia and Russia: \$60–\$70 per session (personal information). Lower reimbursement rates may be one of the reasons for the slow growth in ESRD care in some of these countries. In the past, money for new dialysis units came mainly from the public sector. Most ministries of health budgeted money specifically for the improvement and development of dialysis facilities. A good example of such a policy is Poland where the Program of Dialysis Improvement and Development, prepared by the nephrology community and based on central fundings, caused a 5-fold increase in RRT patients during the observed period.²⁰ But with access to

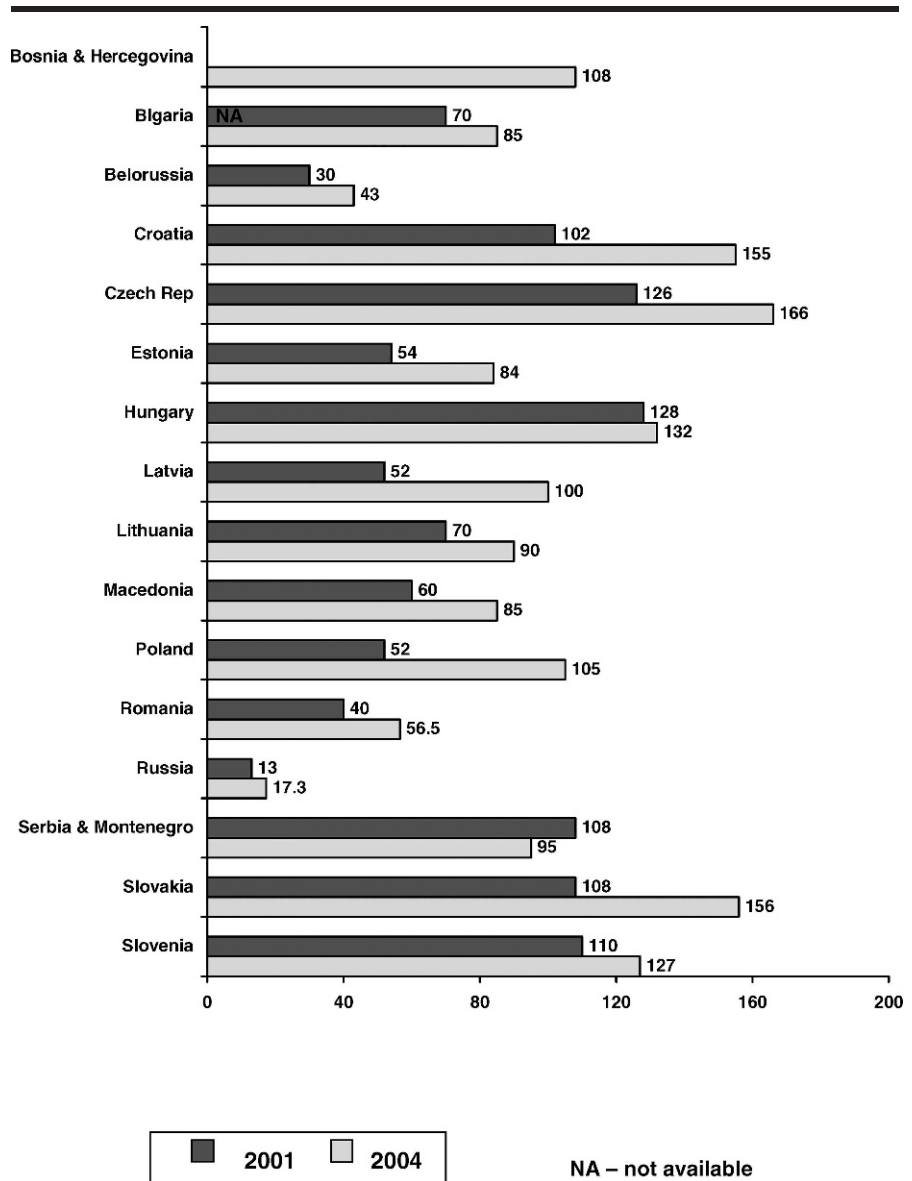


Fig 1. Changes in incidence rate in central and eastern countries between 2001 and 2004

RRT available to all patients with ESRD, the number of patients rose exponentially in these countries. With the reduction of the flow of funds from ministries of health at the beginning of this century, there has been a rapid growth of private dialysis facilities (Figure 2). The highest number of non-public dialysis units is found in Hungary and Slovakia. The group with the second highest number is Lithuania, Poland, and the Czech Republic

(30%–55%). There are also CEE countries with no nonpublic dialysis units at all, like Belorussia, Croatia, and Macedonia. In Bulgaria, only a few units were privatized as a kind of medical and economic experiment. Quick and intensive privatization was observed in Romania, where 17% of dialysis units were privatized in 2004.¹⁶ It is hoped that the privatization of dialysis units not only stimulates new investment and introduces modern dialysis techniques

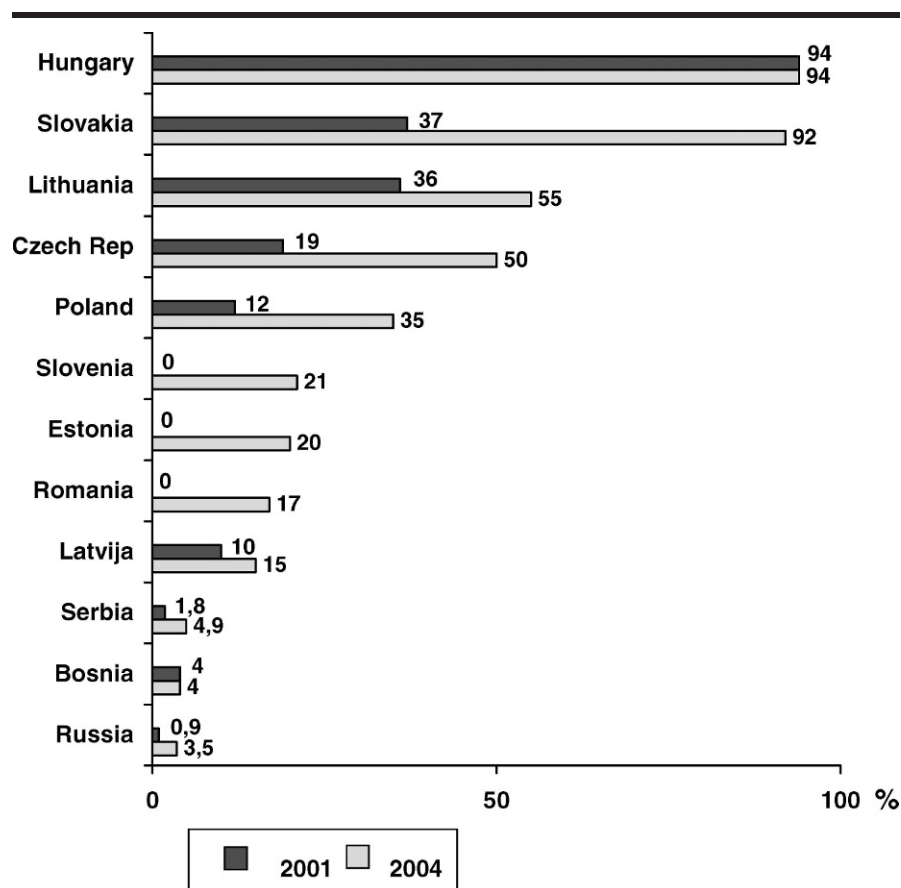


Fig 2. Percentage of patients treated in private (non-public) hemodialysis units

Table 3. Reimbursement rate for hemodialysis treatment in selected Central and Eastern European and Western European countries

Country	Hemodialysis Reimbursement Rate (\$)	Element Included in Reimbursement Rate		
		Erythropoiesis-stimulating Agents	Laboratory Tests	Transplantation
Central and Eastern Europe				
Slovenia	199	+	+	+
Czech Republic	149	-	-	-
Romania	148	+	+	+
Lithuania	125	-	+	-
Slovakia	119	-	-	-
Hungary	108	-	-	-
Poland	112	+	+	+
Western Europe				
France	368*/48/588	-	-	-
Italy	185	-	+	-
United Kingdom	161	-	+	-
Spain	157	-	+	-
Portugal	143	-	-	-

* Public units

but also encourages a more rational use of reimbursement funds.²⁴

Renal Registries

During the existence of the Eastern Bloc, in most CEE countries, national renal registries collaborated with the European Renal Association-European Dialysis and Transplant Association (ERA-EDTA) Registry. One exception was the former Soviet Union, which could account for the nonavailability of earlier data from Russia and post-Soviet countries. After the partition of unified Yugoslavia, 5 independent countries appeared, and gradually 5 new registries were established. This was also true of Czechoslovakia, where we now have independent countries with 2 separate renal registries. More or less in this same period, the ERA-EDTA Registry also changed its format for data collection. For this reason, at the beginning of the 1990s, real difficulty existed with collecting reliable data from the CEE region. Nevertheless, using special surveys conducted together with members of the CEE Advisory Board for Chronic Renal Failure, we were able to cover this gap and inform the international nephrology community of our problems and achievements.²⁻⁴

The current situation of the renal registries is shown in Table 4. Most of them are still using questionnaires aimed at gathering data about each center as a whole, but gradually more registries are introducing more reliable systems aimed at gathering data on individual patients as well.

Summary and Conclusions

During the past 20 years, RRT has developed quite dramatically in the CEE region and is widely available in most CEE countries. Though RRT modalities like dialysis and renal transplantation evolved simultaneously, the expansion of these programs differed vastly from country to country. Unsatisfactory levels are still seen in Belorussia and Russia, and additional support from

Table 4. Renal registries in Central and Eastern Europe

Country	Data Collection Manner		% of Collaborating Renal Units	Collaboration With ERA-EDTA Registry
	Center Questionnaire	Individual Patient Questionnaire		
Bosnia and Hercegovina	-	X	100	+
Bulgaria	X	-	100	+
Belorussia	X	-	100	-
Croatia	-	X	100	+
Czech Republic	X	-	96	+
Estonia	X	-	100	+
Hungary	X	-	100	-
Latvia	X	-	87	+
Lithuania	-	X	100	-
Macedonia	X	-	100	+
Poland	X	-	98	+
Romania	X	-	100	+
Russia	X	-	94	+
Serbia and Montenegro	X	-	68	+
Slovakia	X	-	52	+
Slovenia	-	X	100	+

the healthcare system in these countries is necessary. The lowest rates of RRT are seen in Albania, Moldova, and Ukraine, but reliable data from these countries are lacking.

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