



## Special report

# Blood and marrow transplantation activity in Europe 1996

A Gratwohl<sup>1</sup>, J Passweg<sup>1</sup>, H Baldomero<sup>2</sup> and J Hermans<sup>3</sup> for the European Group for Blood and Marrow Transplantation (EBMT)

Division of Hematology, <sup>1</sup>Department of Internal Medicine and <sup>2</sup>Department of Research, Kantonsspital Basel, Switzerland; and <sup>3</sup>Department of Medical Statistics, University of Leiden, The Netherlands

### Summary:

Transplant activity by members of the European Group for Blood and Marrow Transplantation (EBMT) and related European teams is reported for 1996 by indication, donor type and stem cell source. Bearing in mind reports from previous years, the annual numbers of transplants for each indication, transplant rates for each participating country, changes in transplant rates by indication and changes in donor types and stem cell sources are described. A total 14 593 blood or marrow transplants, performed in Europe by 382 teams from 31 countries, were reported in 1996. Of these, 4393 (30%) were allogeneic and 10 200 (70%) were autologous transplants. Of the autologous transplants, 978 (10%) were bone marrow derived, 9222 (90%) from peripheral blood stem cells or combined bone marrow and peripheral blood stem cell transplants. Of the allogeneic transplants, 3252 (74%) were bone marrow and 1141 (26%) were peripheral blood stem cell transplants. Main indications in 1996 were leukemias with 4961 transplants (34%), 70% allogeneic and 30% autologous; lymphomas with 5505 transplants (38%), 6% allogeneic and 94% autologous; solid tumours with 3484 transplants (24%), 1% allogeneic and 99% autologous; non-malignant disorders with 643 transplants (4%), 92% allogeneic and 8% autologous. There are major differences between countries. Transplant rates per 10m inhabitants per country ranged from 0 to >500 (median 202 per 10 m inhabitants). The most pronounced increase since 1990 for new indications in autologous transplants was observed in multiple myeloma and carcinoma of the breast. These data reflect recent changes and present status of blood and marrow transplantation in Europe. They provide a basis for patient counselling and health care planning.

**Keywords:** bone marrow transplantation; peripheral blood stem cell transplantation; epidemiology; transplant activity; Europe; coefficient of variation

Major developments have occurred in the field of hematopoietic stem cell transplantation since the first successful transplants from HLA-identical siblings in 1968.<sup>1,2</sup> The formerly experimental procedure has become established therapy for a vast number of congenital or acquired disorders of the hematopoietic system and for chemo- or radiosensitive malignancies.<sup>3-6</sup> Reduced transplant-related mortality has led to a widening of indications. The rapid increase in utilization of this technique over the past few years has been documented by the surveys of the International Bone Marrow Transplant Registry (IBMTR)<sup>7,8</sup> and annual transplant activity report of the European Group for Blood and Marrow Transplantation (EBMT).<sup>9-14</sup> Traditional bone marrow transplantation has been supplemented by transplantation of hematopoietic stem and progenitor cells from different stem cell sources and donor types. Blood and marrow transplantation today includes autologous and allogeneic transplants from bone marrow, peripheral blood, cord blood and, occasionally, fetal liver as a stem cell source. Donors for allogeneic transplants can be HLA-identical siblings, HLA-mismatched relatives or unrelated volunteers. The present report, the seventh of a series, summarizes transplant activity in Europe in 1996. It concentrates on the rapid changes in stem cell source, donor type and indications since 1990, when the EBMT activity survey was first introduced. Awareness of these changes is essential for correct interpretation of current data.

### Patients and methods

#### Activity survey

All EBMT members are requested to report their transplant numbers annually for the preceding year by indication, stem cell source and donor type (Table 1). The same questionnaire is sent to non-members, known to the investigators to perform transplants, and to teams made known to EBMT by national organisations, neighboring teams or hospital administrators. The first survey was conducted for 1990.<sup>9</sup> In 1993, all participating teams were additionally requested to report their transplant numbers selectively for 1973 and 1983. These data have been published.<sup>12</sup> Numbers of transplant patients rather than numbers of transplants are coun-

Correspondence: Prof Dr A Gratwohl, Kantonsspital Basel, Division of Hematology, Department of Internal Medicine, CH-4031 Basel, Switzerland

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**Table 1** Number of transplants performed in Europe in 1996 by indication, donor type and donor source

Indication	Donor source No. of transplants														
	Allogeneic								Autologous			Total			
	Family				Unrelated				BM only	PBPC only	BM + PBPC	Allo	Auto	Total	
	HLA-id		Non-id		twin		BM	PBPC							
	BM	PBPC	BM	PBPC	BM	PBPC	BM	PBPC							
<i>Leukemias</i>													3451	1510	4961
Acute myeloid leukemia															
1st complete remission	402	160	9	14	3	2	33	3	200	342	54	626	596	1222	
not 1st complete remission	185	101	22	24	1	1	114	17	91	92	19	465	202	667	
Acute lymphatic leukemia															
1st complete remission	203	51	5	4	1	1	59	7	90	114	9	331	213	544	
not 1st complete remission	244	76	40	54	1	1	176	14	47	83	4	606	134	740	
Chronic myeloid leukemia															
chronic phase	427	147	22	13	1	4	221	7	18	166	2	842	186	1028	
not 1st chronic phase	79	55	7	30	2	1	100	11	7	62	4	285	73	358	
Myelodysplastic syndrome	114	71	10	9	2	1	60	1	13	23	2	268	38	306	
Chronic lymphatic leukemia	16	10		1			1		11	55	2	28	68	96	
<i>Lymphoproliferative disorders</i>												333	5172	5505	
Myeloma	71	40	5	2	1	3	3		61	1653	30	125	1744	1869	
Hodgkin's lymphoma	12	12	1	1		1	2		123	755	58	29	936	965	
Non-Hodgkin lymphoma	97	58	1	5	2	4	9	3	184	2233	75	179	2492	2671	
<i>Solid tumors</i>												19	3465	3484	
Neuroblastoma	1	1						1	45	153	17	3	215	218	
Glioma									21	19	3		43	43	
Soft tissue sarcoma									8	87	6		101	101	
Germinal tumors	1	1				1			20	306	9	3	335	338	
Breast carcinoma	1	3							17	2175	17	4	2209	2213	
Ewing		1			1	1			3	161	2	3	166	169	
Other solid tumors	2	3						1	15	371	10	6	396	402	
<i>Non-malignant disorders</i>												590	53	643	
Severe aplastic anemia + Fanconi	137	29	8	5	1	1	26	9				216		216	
Thalassemia	96	6										102		102	
SCID	19	7	16	12			6	1				61		61	
Inborn errors	50	4	14	8			48	4				128		128	
Others	41	13	5	7	1		14	2	4	47	2	83	53	136	
<b>Total</b>	<b>2198</b>	<b>849</b>	<b>165</b>	<b>189</b>	<b>17</b>	<b>22</b>	<b>872</b>	<b>81</b>	<b>978</b>	<b>8897</b>	<b>325</b>	<b>4393</b>	<b>10200</b>	<b>14593</b>	

HLA-id = identical sibling donor; Non-id = family donor other than HLA-identical sibling; BM = bone marrow; PBPC = peripheral precursor blood cells; Both = bone marrow + peripheral precursor blood cells; Allo = total allogeneic transplants; Auto = total of autologous transplants.

ted omitting second, double, or re-transplants. Stem cell source has been included as a variation since 1991.

#### Participating teams

382 teams from 31 European countries and, by EBMT tradition, teams from Israel and Saudi Arabia report all consecutive allogeneic and autologous transplants. They are listed in the Appendix in alphabetical order of country, town, center and reporting physician. According to personal communications, no blood or marrow transplants were performed in 1996 in Albania, Andorra, Armenia, Azerbaijan, Bosnia-Herzegovina, Bulgaria, Cyprus, Georgia, Iceland, Latvia, Liechtenstein, Lithuania, Macedonia, Malta, Moldova, Monaco, Romania, San Marino, Ukraine and the Vatican.

#### Data validation

Reported data are entered in a computer file. Before data analysis, a printout is sent to each team for validation and

verification. In countries with a national transplantation agency or registry, data are compared with the respective national coordinators. Discrepancies between reports to the national agency and EBMT are corrected by contacting teams in question for rectification.

Eight teams reporting in 1995 failed to reply to the 1996 survey. These are listed in the Appendix as 'missing'. According to our estimate, the report covers 95% of all allogeneic and probably almost 90% of all autologous blood or marrow transplants performed in Europe in 1996.

#### Statistical analysis

Relative transplant activity per 10m inhabitants, ie transplant rate, was calculated for participating countries by computing the number of teams and transplants against the number of inhabitants, as taken from the *Fischer's Weltalmanach*<sup>15</sup> (Table 2). Calculations were made for all transplants and then separately for allogeneic, autologous and unrelated transplants.

The coefficient of variation (CV), defined as CV

**Table 2** Transplant rates per 10 million inhabitants in participating European countries in 1996

European transplantation data 1996														
Country	Pop. in mil.	Team numbers					Transplant numbers							
		Total	ALLO only	AUTO only	ALLO + AUTO	Per 10 mil.	BMT		ALLO		AUTO		UNREL	
							Total	Per 10 mil.	Total	Per 10 mil.	Total	Per 10 mil.	Total	Per 10 mil.
Austria	7.9	9		3	6	11.4	255	323	82	104	173	219	29	37
Belgium	10	15		3	12	15.0	463	463	137	137	326	326	34	34
Croatia	4.8	2		1	1	4.2	97	202	30	63	67	140	4	8
Czech Republic	10.3	8		4	4	7.8	277	269	57	55	220	214	8	8
Denmark	5.2	3		2	1	5.8	150	288	52	100	98	188	20	38
Estonia	1.6	1		1		6.3	8	50	0	0	8	50	0	0
Finland	5	5		2	3	10.0	185	370	70	140	115	230	30	60
France	57.4	45	1	13	31	7.8	2445	426	628	109	1817	317	120	21
Germany	81	54	2	19	33	6.7	2400	296	765	94	1635	202	248	31
Greece	10.3	5			5	4.9	143	139	64	62	79	77	3	3
Hungary	10.3	2			2	1.9	45	44	29	28	16	16	1	1
Iran	57.7	1			1	0.2	33	6	19	3	14	2	0	0
Ireland	3.5	2			2	5.7	47	134	35	100	12	34	12	34
Israel	4.9	3			3	6.1	312	637	117	239	195	398	8	16
Italy	57.7	54		19	35	9.4	2115	367	650	113	1465	254	85	15
Luxembourg	0.3	1			1	33.3	29	967	1	33	28	933	0	0
The Netherlands	15	13		6	7	8.7	492	328	212	141	280	187	37	25
Norway	4.3	2		1	1	4.7	70	163	35	81	35	81	15	35
Poland <sup>a</sup>	38.4	8	1		6	2.1	187	49	68	18	119	31	0	0
Portugal	9.9	4		1	3	4.0	179	181	62	63	117	118	4	4
Republic of Belarus	10.3	1			1	1.0	29	28	7	7	22	21	0	0
Russia	148.7	5		2	3	0.3	65	4	9	1	56	4	0	0
Saudi Arabia	16.9	1			1	0.6	16	9	15	9	1	1	0	0
Slovakia	5.3	3		2	1	5.7	70	132	19	36	51	96	0	0
Slovenia	2	1			1	5.0	9	45	6	30	3	15	0	0
Spain	38.9	60		25	35	15.4	1976	508	397	102	1579	406	58	15
Sweden	8.6	9		3	6	10.5	386	449	110	128	276	321	46	53
Switzerland	6.9	8		5	3	11.6	243	352	69	100	174	252	7	10
Turkey	57.2	8	1		7	1.4	102	18	70	12	32	6	0	0
United Kingdom <sup>a</sup>	57.6	46		12	33	8.0	1736	301	565	98	1171	203	184	32
Yugoslavia (Serbia + Montenegro)	10.4	3			3	2.9	29	28	13	13	16	15	0	0
Median						5.8		202		63		140		8
Total		382	5	124	251		14593		4393		10200		953	

<sup>a</sup>Includes one team with zero transplants in 1996.

(%) = (s.d./mean) × 100, was used as a measure of homogeneity among participating countries and to quantitatively assess consensus for certain indications as previously described.<sup>16,17</sup> The number of transplants per 10m inhabitants was calculated for each indication and European country with at least 100 transplants in 1995 and 1996. These include Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Italy, The Netherlands, Poland, Portugal, Spain, Sweden, Switzerland and UK. Indications considered were acute myeloid, acute lymphoid and chronic myeloid leukemia and myelodysplastic syndromes; Hodgkin's lymphoma, non-Hodgkin's lymphoma and multiple myeloma for lymphoproliferative disorders; neuroblastoma, germ cell tumors and carcinoma of the breast for solid tumors; severe aplastic anemia and thalassemia for non-malignant disorders. The coefficient of variation in transplant rates between these 16 countries was determined for all these indications and for each survey year since 1990.

Mean, median, range and coefficient of variation of numerical variables were calculated with the Excel spreadsheet. Regression analysis to evaluate changes over time and correlation to evaluate associations were applied where appropriate.

## Results

### Participating teams

382 participating teams from 31 countries reported to the survey in 1996. Since the first survey in 1990, numbers of participating teams has risen from 143 to 382, almost exclusively due to new teams starting transplant activities. The current report includes all teams reporting to the 1995 survey except for nine (response rate 98%).

The majority of teams, ie 251/382 (66%), do both allogeneic and autologous transplants, 124 (32%) of teams

restrict their activity to autologous, five (2%) to allogeneic transplants only (Table 2).

### Transplant figures

A total 14 593 transplants, 4393 allogeneic (30%) and 10 200 autologous (70%) were carried out in 1996. This represents an increase of 18% over 1995, when there were 12 101 transplants (3858 allogeneic, 8243 autologous). This increase is due to new teams (8% increase) and greater numbers of transplants by established teams.

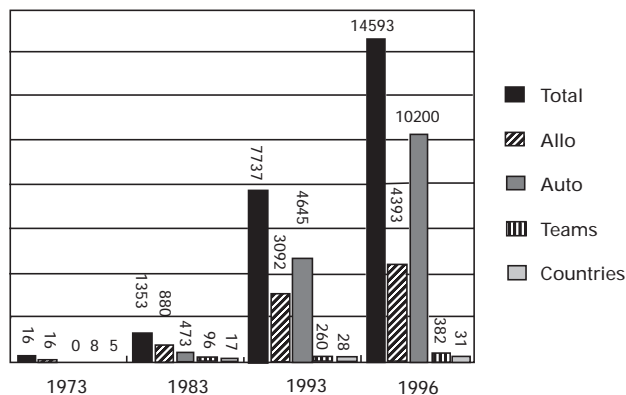
The rise in transplant activity with 16 transplants from 1973, 1353 transplants in 1983 and a further increase since 1990, is illustrated in Figure 1.

### Main indications

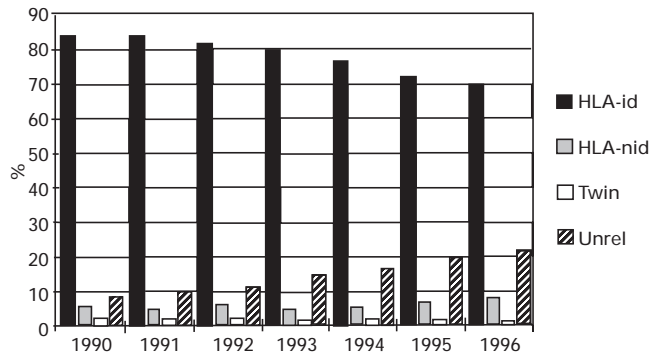
Indications for transplants in 1996 are listed in detail in Table 1. Main indications for the 14 593 patients were lymphomas with 5505 transplants (38%), 333 (6%) allogeneic and 5172 (94%) autologous; leukemias with 4961 transplants (34%), 3451 (70%) allogeneic and 1510 (30%) autologous; solid tumors with 3484 transplants (24%), 19 (1%) allogeneic and 3465 (99%) autologous and non-malignant disorders with 643 transplants (4%), 590 (92%) allogeneic and 53 (8%) autologous. The relative proportion of indications has remained constant for allogeneic transplants; there has been a shift in main indications for autologous transplants with an increase in solid tumors from 18% (377/2097) in 1990 to 34% (3465/10 200) of all autologous transplants in 1996 ( $P < 0.01$ ).

### Donor type

Of the 14 593 transplants in 1996, 4393 were allogeneic (30%) and 10 200 autologous (70%). For the 4393 allogeneic transplants, donors were an HLA-identical sibling (70%) for 3047 recipients, HLA non-identical family member (8%) for 354 recipients, syngeneic twin (1%) for 39 recipients and an unrelated, volunteer donor (22%) for 953 recipients. Changes in donor type for the allogeneic trans-



**Figure 1** Evolution of blood and marrow stem cell transplants in Europe since 1973, the year of the foundation of the European Group for Blood and Marrow Transplantation EBMT. The graph illustrates total transplants, allogeneic and autologous transplants, number of transplant teams and number of countries performing transplants.



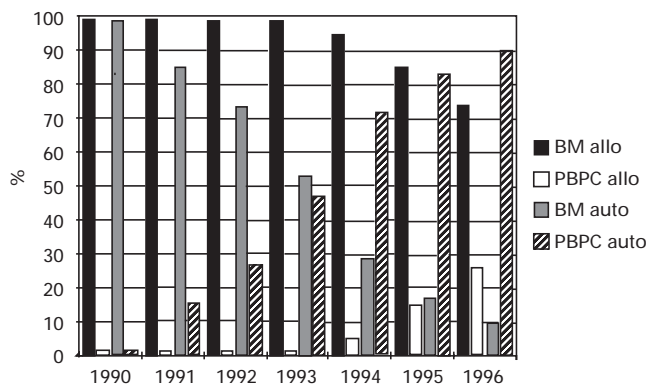
**Figure 2** Changes in donor type for allogeneic blood and marrow transplants between 1990 and 1996. Illustrated are the proportion of HLA-identical sibling, other family member, twin donor and unrelated volunteer donor transplants.

plants since 1990 are illustrated in Figure 2. The proportion of unrelated transplants has increased from less than 1% in 1983 to 181 (8.5%) in 1990 and 953 (22%) in 1996.<sup>12</sup> The most frequent indications for unrelated allogeneic transplants are chronic myeloid leukemia in chronic phase, acute leukemias beyond first complete remission and congenital disorders.

### Stem cell source

Of the 10 200 autologous transplants, 978 (10%) were bone marrow derived, 8897 (87%) from peripheral blood and 325 (3%) combined bone marrow and peripheral blood cells. In 1991, the proportion of autologous bone marrow-derived cells was 85%. This rapid shift in donor source is illustrated in Figure 3.

In 1991, no allogeneic peripheral blood stem cell transplants were reported. In 1996, 3252 (74%) of the 4393 allogeneic transplants were bone marrow derived, 1141 (26%) used peripheral blood stem cells. The proportion of unrelated peripheral blood stem cell transplants is low (81/953, 8%) compared to 28% for the HLA-identical sibling donors, 54% for related non-identical donors and 59% for



**Figure 3** Changes in donor source of blood and marrow transplants in Europe between 1990 and 1996. Percentages of bone marrow derived, or peripheral blood derived, stem cells are given separately for allogeneic and autologous transplants. Transplants of combined bone marrow and peripheral blood transplants are included in the peripheral blood transplants.

twin donors. This change, occurring since 1991, is illustrated in Figure 3.

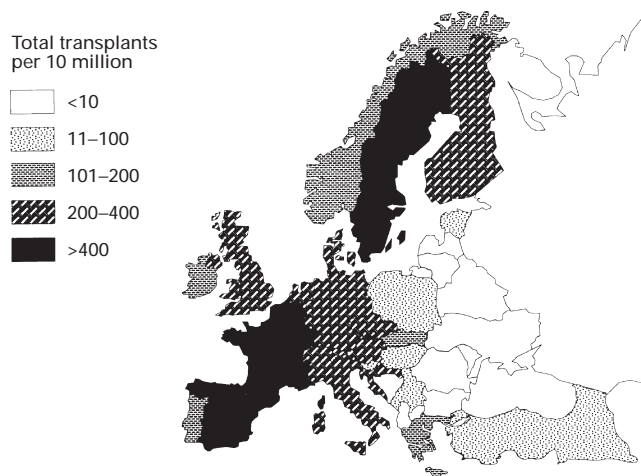
A total 71 allogeneic cord blood transplants were reported. This represents 2% of all allogeneic transplants in 1996. Detailed figures of cord blood transplants have only been collected since 1996.

#### Transplant rates per number of inhabitants

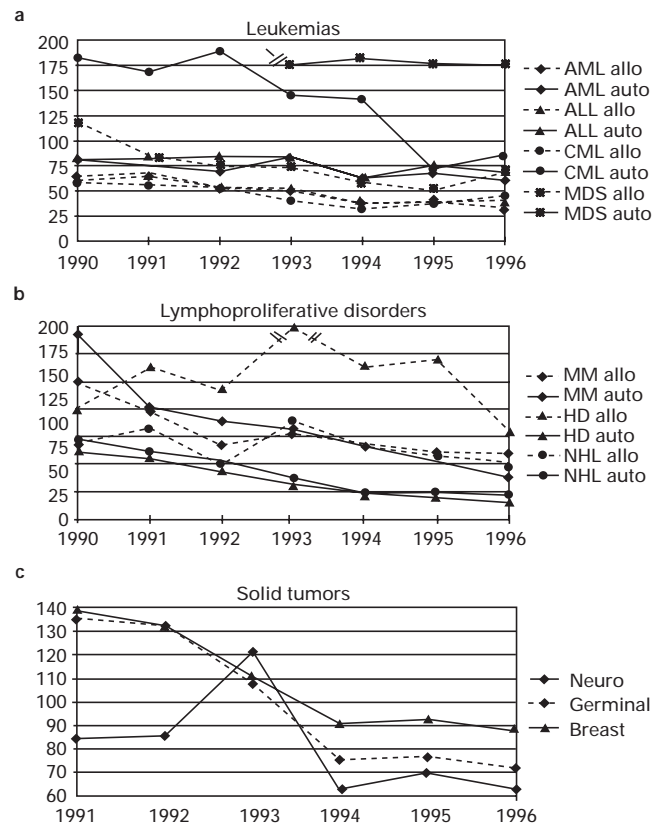
There are significant differences between participating countries, as shown in Table 2. The number of teams ranges from <1 to >10 per 10 m inhabitants. There is no significant correlation between the total number of transplants and the number of teams ( $r = 0.16$ ;  $P = 0.39$ ). Transplants per 10 m inhabitants (= transplant rates) range from <1 (several countries) to 967 (Luxemburg) with a median of 202 per 10 m inhabitants (median of those countries with transplants only) and is illustrated in Figure 4. In general, differences in transplant rates between participating countries are similar for total transplants as for allogeneic, autologous or unrelated transplants. The high numbers of transplants per 10 m inhabitants in Israel and Luxemburg is in part explained by a high referral rate of non-residents (personal communications).

#### Variation of transplant rates (coefficient of variation) by indication

The CVs and changes in CVs over time are illustrated for leukemias (Figure 5a), lymphoproliferative disorders (Figure 5b) and solid tumors (Figure 5c). In general, all CVs have dropped, indicating a progressive consensus. The lowest CVs for allogeneic transplants are found in acute myeloid leukemia (CV 33%), acute lymphoid leukemia (CV 41%) and chronic myeloid leukemia (CV 44%), for autologous transplants in Hodgkin's disease (CV 41%) and non-Hodgkin's lymphoma (CV 46%). The figures show that carcinoma of the breast, multiple myeloma and chronic myeloid leukemia have become indications for autologous transplantation over the last few years.



**Figure 4** Transplant rates per 10 m inhabitants in participating countries in 1996. Figures represent total number of all transplants, combined autologous and allogeneic transplants as <10 or unknown, 11–100, 101–200, 201–400 or >400 transplants per 10 m inhabitants.



**Figure 5** Changes in coefficient of variation (CV) in transplant rates for selected indications from 1990 to 1996. (a) Leukemias; (b) lymphoproliferative disorders; (c) solid tumors.

#### Discussion

The present report, the seventh of a series,<sup>9–14</sup> gives information on transplant numbers, transplant rates, stem cell sources, donor types and indications for blood and marrow transplants in Europe. It illustrates four major trends of the last 7 years. The number of transplants of blood and marrow progenitor cells is increasing rapidly, there is a shift from bone marrow to peripheral blood-derived cells in both autologous and allogeneic transplants, unrelated donor transplants are used increasingly and new indications for autologous transplants are emerging.

The report underlines the rapid evolution of blood and marrow transplantation from an experimental undertaking 30 years ago<sup>1,2</sup> to an established procedure today. More than 14 000 transplants were performed last year in Europe, an estimated total of 30 000 worldwide. This evolution appears unbroken despite increasing economic difficulties facing the health care system. The trend is likely to continue. Recent publications of prospective controlled randomized studies document the therapeutic benefit of high-dose therapy and autologous stem cell transplants.<sup>18–20</sup> Several studies are in progress. There is evidence to support the concept of an allogeneic graft vs tumor response.<sup>21</sup> Unrelated donor transplants have become an established procedure,<sup>22</sup> donor registries continue to grow and cord blood is emerging as an additional source of stem cells for patients without donors.<sup>23–25</sup>

There has been a rapid shift from bone marrow to peripheral blood in a short period. Only 10 years ago, almost all transplants were bone marrow derived. Autologous peripheral blood precursor cell collection is relatively easy. These transplants engraft rapidly and reliably.<sup>26</sup> Autologous bone marrow transplants will remain restricted to the few patients unable, or unwilling, to undergo peripheral harvesting. In the allogeneic setting, fear of excessive graft-versus-host disease and reluctance to use mobilization techniques has long precluded the use of peripheral blood precursor cells.<sup>27</sup> Single centre pilot studies and retrospective multicenter analyses have confirmed feasibility.<sup>28-31</sup> A prospective randomized controlled study showed more rapid recovery and no adverse effects on short-term outcome as compared to allogeneic bone marrow transplants.<sup>32</sup> Effects on long-term outcome, such as chronic graft-versus-host disease, relapse and survival, as well as effects of mobilization on donors are still unknown. If preliminary data are confirmed, donors will have the choice between bone marrow harvest with its risks from anesthesia, or peripheral blood donation and its mobilization risk.<sup>33</sup> Teams in many countries also offer this possibility to unrelated volunteer donors.<sup>22</sup>

The relative ease and safety of autologous peripheral blood transplants, with transplant-related mortality under 5%, has led to new indications.<sup>34</sup> Multiple myeloma has emerged as an indication for autologous transplantation, documented in prospective randomized trials and illustrated in this report.<sup>20</sup> Carcinoma of the breast is at present the most frequent single indication for autologous transplantation in solid tumors. Ongoing prospective randomized trials will help to determine its place. New, previously undermined indications, such as severe autoimmune disorders, are now under scrutiny.<sup>35,36</sup>

The current analysis confirms previously observed discrepancies between Western and Eastern Europe, partly reflecting differences in economic status.<sup>10</sup> It remains a challenge to supply modern medical technology to all countries, and it is comforting to note increasing activity in some Eastern European countries.

Varying prevalence of disease can explain differences in transplant rates for some indications, eg thalassemia. In contrast, prevalence does not differ significantly for most hematological malignancies.<sup>36</sup> Other reasons, including heterogeneity in medical opinion, can explain part of the differences. The CV in transplant rates provides an instrument for assessing consensus in an objective quantitative way.<sup>37</sup> During the observation period, CVs have decreased for most indications and lowest CVs are found for the indications recommended by expert panels.<sup>6</sup> The optimal time point for procedure remains debatable, eg should a transplant be performed in first or subsequent remission for a patient with acute myeloid leukemia. Answers to these questions depend on disease, patient and donor factors.

This report provides no information on outcome, for which data are being collected and will be reported with due follow-up.<sup>14</sup> Awareness of the most significant changes in recent years will be essential for analysis and interpretation of outcome. Knowledge of current activity and ongoing trends form a basis for health care planning and for

setting up guidelines and recommendations for patient counselling.

## Acknowledgements

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## Appendix 1996

List of transplant centres and numbers of transplants performed (numbers in brackets show total number of transplants followed by allografts/autografts)

*Albania: no report*

*Andorra: no report*

*Armenia: no report*

*Austria (9 teams; 255, 82/173)*

Graz, Universitäts-Kinderklinik, CIC 593, Ch Urban (6, 4/2)

Innsbruck, Universitätsspital, CIC 271, D Niederwieser (30, 12/18)

Linz, 1. Medizinische Abteilung, AO Krankenhaus, MA Friedrik (2, 0/2)

Linz, AOK der Elisabethinen, CIC 594, D Lutz (23, 4/19)  
Vienna, St Anna Kinderspital, CIC 528, H Gadner, C Peters (34, 18/16)

Vienna, Donauspital, CIC 767, W Hinterberger (18, 0/18)  
Vienna, Universitätsklinik für Innere Medizin I -AKH, CIC 227, P Kalhs, HT Greinix, (72, 41/31)

Vienna, Wilhelminerspital, CIC 828, H Ludwig (56, 1/55)  
Vienna, Hanusch-Krankenhaus, CIC 743, R Reisner (12, 0/12)

*Azerbaijan: no report*

*Republic of Belarus (1 team; 29, 7/22))*

Minsk, Hospital No. 9, CIC 801, N Milanovitch (29, 7/22)  
Minsk, Inst. Haematology, CIC 326, V Ivanov (missing)

*Belgium (15 teams; 463, 137/326)*

Antwerpen, AZ Middelheim, CIC 783, R de Bock (10, 0/10)  
Brugge, AZ St Jan, CIC 506, A van Hoof, D Selleslag (38, 12/26)  
Brussels, Children's University Hospital, CIC 644, C Devalck, E Sariban (6, 4/2)  
Brussels, Hôpital Erasme, CIC 596, W Feremans (20, 0/20)  
Brussels, Clinique Universitaire St Luc (Adults), CIC 234, A Ferrant (40, 15/25)  
Brussels, Institut Jules Bordet, CIC 215, P Stryckmans, L Debusscher (33, 16/17)  
Brussels, University Hospital, CIC 630, B van Camp, A Schots (41, 13/28)  
Brussels, Clinique Universitaire St Luc (Pediatrics), CIC 234, C Vermeylen (18, 8/10)  
Charleroi, Hôpital Notre-Dame, JL Canon, M André, (27, 4/23)  
Edegem, University Antwerpen, CIC 648, W Schroyens (16, 5/11)  
Gent, University Hospital, CIC 744, LA Noens (33, 15/18)  
Haine St Paul, Hôpital de Jolimont, CIC 234, A Delannoy, C Ravoet (11, 0/11)  
Hasselt, Virgajesse Ziekenhuis, Dr Janssen (missing)  
Leuven, University Hospital, CIC 209, MA Boogaerts (72, 19/53)  
Liège, University Hospital Sart-Tilman, CIC 726, Y Bégiun (70, 18/52)  
Roeselaere, H Hartziekenhuis, Van Aelst (missing)  
Yvoir, Clinique Universitaire de Mont-Godinne, C Doyen (28, 8/20)

*Bosnia-Herzegovina: no report*

*Bulgaria: no report*

*Croatia (2 teams: 97, 30/67)*

Zagreb, Hospital Merkur, CIC 309, B Jaksic (18, 0/18)  
Zagreb, Clinical Hospital Center, CIC 302, B Labar (79, 30/49)

*Cyprus: no report*

*Czech Republic (8 teams; 277, 57/220)*

Brno, Masaryk University Hospital, CIC 597, J Vorlicek (50, 1/49)  
Hradec Kralové, Charles University, CIC 729, S Filip, M Blaha (37, 0/37)  
Pilsen, Faculty Hospital, CIC 718, V Koza (73, 25/48)

Prague, University Hospital Motol (ped onco), P Kavan (31, 1/30)  
Prague, University Hospital Motol (ped haem), J Stary (13, 9/4)  
Prague, Institute of Hematology and Blood Transfusion, CIC 656, A Vitek, P Kobyłka (27, 21/6)  
Prague, Charles University, CIC 745, M Trneny (38, 0/38)  
Prague, Clinical Haematology, Charles University, CIC 318, T Kozak (8, 0/8)

*Denmark (3 teams; 150, 52/98)*

Aarhus, Amtssygehus, CIC 634, A Boesen (33, 0/33)  
Copenhagen, Rigshospitalet, CIC 206, N Jacobsen (97, 52/45)  
Copenhagen, Rigshospitalet, Peds, C Heilmann (4, 0/4)  
Copenhagen, Herlev Hospital, University, CIC 568, HE Johnson (20, 0/20)

*Estonia (1 team; 8, 0/8)*

Tartu, University Hospital, CIC 746, H Everaus (8, 0/8)

*Finland (5 teams; 185, 70/115)*

Helsinki, University Hospital, Dept Oncology, H Joensuu, T Wiklund (27, 0/27)  
Helsinki, University Hospital, Third Dept of Medicine, CIC 515, T Ruutu (69, 48/21)  
Helsinki, Children's Hospital, CIC 219, V Pihkala, J Vettenranta (24, 15/9)  
Tampere, University Hospital, CIC 635, M Lehtinen (27, 0/27)  
Turku, University Central Hospital, CIC 225, K Remes (38, 7/31)

*France (45 teams; 2445, 628/1817)*

Angers, Centre Hospitalier, CIC 650, N Ifrah (35, 8/27)  
Argenteuil, Centre Hospitalier, M Urbajtel (25, 8/17)  
Besançon, Hôpital Jean Minjot and Hôpital St Jacques (Adults & peds), CIC 233, P Hervé, J-Y Cahn, MN Cailleux, E Plouvier (75, 34/41)  
Brest, Centre Hospitalier, C Berthou (missing)  
Caën, Centre Hospitalier Régional, CIC 251, O Reman (missing)  
Clermont Ferrand, Centre Jean Perrin, CIC 273, M Legros (66, 8/58)  
Créteil, Hôpital H Mondor, CIC 252, JP Vernant (72, 37/35)  
Dijon, Centre Georges François Leclerc, F Mayer (2, 0/2)  
Dijon, Hôpital d'Enfants, D Caillot (46, 0/46)  
Grenoble, Centre Hospitalier, CIC 270, JJ Sotto, L Molina, F Nicolini (60, 10/50)  
Lille, Hôpital Claude Huriez, CIC 277, F Bauters, JP Jouet (110, 32/78)  
Lyon, Hôpital Edouard Herriot, CIC 671, D Fiere, E Archimbaud, A Belhabri, M Michallet (75, 21/54)  
Lyon, Centre Léon Bérard, CIC 241, T Philip (101, 0/101)  
Lyon, Hôpital Debrousse, CIC 806, N Philippe, G Souillet (31, 27/4)

Marseille, Inst Paoli-Calmettes, CIC 230, D Blaise (219, 21/198)  
Marseille Hôpital d'Enfants de la Timone, CIC 301, G Michel, C Coze (missing)  
Mulhouse, Hôpital du Hasenrain, P Henon, Becker (missing)  
Nantes, Hôpital St Jacques, CIC 253, JL Harousseau, N Milpied (155, 39/116)  
Nice, Hôpital de Cimiez, CIC 523, JG Fuzibet, N Gratecos (34, 5/29)  
Nice, Centre Antoine Lacassagne, A Thyss (13, 0/13)  
Paris, Hôpital Laennec, JM Andrieu, C Le Maignan (4, 1/3)  
Paris, Hôpital d'Instruction des Armées Percy, Clamart, T de Revel, G Nedellec (20, 4/16)  
Paris, Hôpital Cochin, F Dreyfus (22, 0/22)  
Paris, Hôpital Necker des Enfants Malades, CIC 210, A Fischer (39, 38/1)  
Paris, Hôpital St Louis (autologous), CIC 805, G Gisselbrecht (56, 0/56)  
Paris Hôpital St Louis (allogeneic), CIC 207, E Gluckman (58, 58/0)  
Paris Hôpital St Antoine, CIC 213, NC. Gorin L Fouillard (49, 15/34)  
Paris, Hôpital Pitié Salpêtrière, CIC 262, V Leblond (53, 18/35)  
Paris, Hôpital Tenon, JP Lotz (34, 0/34)  
Paris, Hôpital Robert Debré, P Rohrlich E Wilmer (24, 23/1)  
Paris, Hôpital Necker (adults), CIC 201, B Varet, C Bélanger, A Veil (54, 31/23)  
Paris, Hôtel Dieu, CIC 222, R Zittoun, B Rio (44, 14/30)  
Paris, Institut Curie (peds) CIC 702, JM Zucker, J Michon (28, 0/28)  
Paris, Institut Curie (ads/onko), CIC 702, P Pouillart, J Michon (67, 0/67)  
Pessac, Hôpital Haut-Lévêque, CIC 267, J Reiffers, Dr Fabères (107, 33/74)  
Poitiers, Hôpital Jean Bernard, CIC 264, A Sadoun (49, 15/34)  
Rennes, Hôpital Pontchaillou, C Dauriac (63, 17/46)  
Rennes, CHRU, Clinique Médical Infantile, E le Gall, V Gandemer (7, 1/6)  
Rouen, Centre Henri Becquerel, H Tilly (42, 10/32)  
St Cloud, Centre René Huguenin, M Janvier (21, 0/21)  
St Etienne, Hôpital Etienne, CIC 250, D Guyotat, J.L. Stephan (19, 6/13)  
Strasbourg, Hôpital de Hautepierre, B Lioure (94, 22/72)  
Strasbourg, Hospices Civils, Service de Péd. 5, P Lutz (11, 8/3)  
Strasbourg, Hôpital de Purpan, X CIC 624, M Attal (89, 26/63)  
Toulouse, Centre Claudius Régaud, H Roche, C Chevreau (18, 0/18)  
Tours, Hôpital Bretonneau, CIC 272, P Colombat (73, 0/73)  
Vandœuvre-les-Nancy, Hôpital d'Enfants, P Bordigoni (44, 16/28)  
Villejuif, Institut G Roussy (ads + peds), CIC 503, O Hartmann; CIC 666, JL Pico (119, 22/97)  
Villejuif, Hôpital Paul Brousse, MP Lemonnier, B Delmas (18, 0/18)

*Georgia: no report*

*Germany (54 teams; 2400, 765/1635)*

Augsburg, Zentralklinikum, G Schlimok (31, 1/30)  
Bad Saarow, Humaine Klinikum, G Schultze (28, 0/28)  
Berlin, Klinikum Charité, Kinderheilkunde, CIC 807, R Arnold (42, 20/22)  
Berlin, Universitäts-Klinik Benjamin Franklin, CIC 590, W Berdel (31, 5/26)  
Berlin, Universitäts-Klinik Charlottenburg, Virchow Klinikum (ads + peds.until 9.96), CIC 293, W Siegert, HJ Schmid (84, 34/50)  
Berlin, Universitäts-Klinik Charlottenburg, Virchow Klinikum (peds from 9/96), W Ebell (8, 8/0)  
Berlin, Universitäts-Klinik Charlottenburg, Virchow Klinikum (onco), CIC 518, B Dörken (35, 0/35)  
Dresden, Universitätsklinikum Carl Gustav Carus, CIC 808, G Ehninger (24, 9/15)  
Düsseldorf, Zentrum für Kinderheilkunde, CIC 651, S Burdach (23, 12/11)  
Düsseldorf, Medizinische Klinik, CIC 390, C Aul, A Heyll (43, 15/28)  
Erlangen, Universitäts-Klinik für Kinder und Jugendliche, CIC 809, JD Beck, J Greil (7, 1/6)  
Erlangen, Universität Erlangen-Nuremberg, CIC 809, M Gramatzki (32, 14/18)  
Essen, Evangelisches Krankenhaus Essen-Werden GmbH, W Heit (42, 0/42)  
Essen, Universitäts-Klinik (Haem), G Brittinger, M Uppenkamp (7, 0/7)  
Essen, Universitäts-Klinik (Onko), S Seeber, A Harstrick (53, 0/53)  
Essen, Universitäts-Klinik, CIC 259, UW Schaefer, DW Beelen, B Kremens (117, 102/15)  
Frankfurt AM, JW Goethe-Universität, CIC 297, D Hoelzer, H Martin (50, 11/39)  
Freiburg i.Br, Medizinische Universitätsklinik (ads.), CIC 810, J Finke, W Lange (185, 51/134)  
Freiburg i Br, Universitäts-Kinderklinik, CIC 591, C Niemeyer (12, 7/5)  
Greifswald, Ernst-Moritz-Arndt Universität, G Dölken (16, 0/16)  
Halle, Universitäts Klinik Kröllwitz, HJ Schmoll (11, 0/11)  
Hamburg, Eppendorf-Krankenhaus, CIC 614, AR Zander (93, 40/53)  
Hannover, Medizinische Hochschule, CIC 295, A Ganser, B Hertenstein (65, 22/43)  
Hannover, Medizinische Hochschule, Abt. Kinderheilkunde, CIC 295, A Reiter (16, 13/3)  
Heidelberg, Universitäts-Poliklinik, CIC 524, R Haas (191, 1/190)  
Homburg/Saar, Universität des Saarlandes, CIC 785, T Trümper (37, 6/31)  
Idar-Oberstein, Klinik für Hämato-Onkologie, CIC 592, AA Fauser (73, 64/9)  
Jena, Klinik für Innere Medizin II, CIC 533, HG Sayer, K Hoeffken (21, 0/21)  
Jena, Universitäts-Kinderklinik, CIC 750, F. Zintl, D. Fuchs (24, 13/11)

Karlsruhe, Städtisches Klinik, J Fischer (6, 0/6)  
 Kiel, Christian-Albrechts-Universität, CIC 256, N Schmitz (63, 19/44)  
 Köln, Kinderonkologie der Universitäts-Klinik, F Berthold (3, 0/3)  
 Köln, Universitäts-Klinik, CIC 534, H Tesch, Ch Scheid (32, 0/32)  
 Leipzig, Universitäts-Klinik, W Helbig, R Krahl (62, 21/41)  
 Lemgo, Klinikum Lippe, HP Lohrmann (2, 0/2)  
 Magdeburg, Otto-von-Guericke Universität, H-G Höffkes (12, 0/12)  
 Mainz, Medizinische Klinik der Universität, CIC 786, C Huber, K Kolbe (80, 13/67)  
 Mannheim, Klinikum, R Hehlmann (10, 0/10)  
 Marburg, Medizinisches Universitätsklinik, CIC 645, R Weide (33, 3/30)  
 München, Dr. V. Haunersches Kinderspital, R Haas (10, 9/1)  
 München, Klinikum Grosshadern, CIC 513, H-J Kolb (153, 64/89)  
 München, Kinderklinik Schwabing, S Müller-Weihrich (6, 4/2)  
 München, Städtisches Krankenhaus, Ch Nerl, N Fischer (12, 0/12)  
 Münster, Uni. Klinik, CIC 680, Th Büchner, H Ostermann, WE Berdel, J Kienast (27, 0/27)  
 Nürnberg, Klinikum, CIC 625, H Wandt (53, 13/40)  
 Oldenburg, Städtische Kliniken, CIC 749, B Metzner (34, 0/34)  
 Regensburg, Universitäts Klinikum, CIC 787, R Andreesen, A Reichle (57, 0/57)  
 Rostock, Universitäts Klinikum, CIC 585, M Freund, J Casper (17, 0/17)  
 Stuttgart, Olgahospital, Päd. Zentrum, CIC 701, J Treuner, E Koscielniak (7, 1/6)  
 Tübingen, Medizinische Universitäts-Klinik, CIC 223, L Kanz, W Brugger (143, 50/93)  
 Tübingen, Medizinische Universitäts-Klinik, Abteilung Pädiatrie, CIC 535, D Niethammer, T Klingelbiel (40, 27/13)  
 Ulm, Medizinische Universitäts-Klinik, CIC 204, D Bunjes (78, 44/34)  
 Ulm, Kinderklinik der Universität, CIC 296, W Friedrich (31, 27/4)  
 Wiesbaden, Deutsche Klinik für Diagnostik, CIC 311, R Schwerdtfeger (28, 21/7)

*Greece (5 teams; 143, 64/79)*

Athens, Hellenic Cancer Institute St Savas, CIC 751, A Efremidis (27, 3/24)  
 Athens, 'Aghia Sophia' Children's Hospital, CIC 752, S Graphakos (13, 10/3)  
 Athens, Evangelismos Hospital, CIC 751, D. Karakasis, A Skandalis, N Harhalakis, E Nikiforakis (46, 32/14)  
 Athens, Diagnosis and Therapy Centre 'Hygeia', Maroussi, CIC 643, G Karianakis (18, 9/9)  
 Thessaloniki, The George Papanicolaou General Hospital, CIC 561, AS Fassas (39, 10/29)  
 Athens, University, CIC 328, Y Rombos (missing)

*Hungary (2 teams; 45, 29/16)*

Budapest, National Institute of Hematology, CIC 504, E Kelemen, K Palocz, R Denes (20, 15/5)  
 Budapest, Szent Laszlo Hospital, CIC 739, T Masszi, P Reményi, G Kriván (25, 14/11)

*Iceland: no report*

*Iran (1 team; 33, 19/14)*

Tehran, Shariati Hospital, CIC 633, A Ghavamzadeh (33, 19/14)

*Ireland (2 teams; 47, 35/12)*

Dublin, St James's Hospital, CIC 257, SR McCann (32, 22/10)  
 Dublin, Our Lady's Hospital of Sick Children, Crumlin, CIC 774, A O'Meara (15, 13/2)

*Israel (4 teams; 312, 117/195)*

Jerusalem, Hadassah University Hospital, CIC 258, R Or, S Slavin (155, 94/61)  
 Petach-Tikva, Children's Medical Center, CIC 755, I Yaniv (27, 18/9)  
 Revohot, Kaplan Hospital, CIC 327, A Berribi, (missing)  
 Tel Aviv, University, Sheba Medical Center, CIC 754, I Ben-Bassat (130, 5/125)

*Italy (54 teams; 2115, 650/1465)*

Ancona, Ospedale Toarette, CIC 788, P Leoni, A Olivieri (38, 0/38)  
 Avellino, Giovanni di Guglielmo, CIC 789, E Volpe (6, 0/6)  
 Bari, Policlinico, CIC 649, V. Pavone, V Liso (24, 0/24)  
 Bergamo, Ospedale Riuniti, CIC 658, T Barbui (72, 10/62)  
 Bologna, St Orsola University, G Bandini, G Rosti, S Rizzi (139, 30/109)  
 Bologna, Clinica Pediatrica III; CIC 790, A Pession (21, 12/9)  
 Bolzano, Ospedale S, Maurizio, CIC 299, P Coser (44, 0/44)  
 Brescia, Ospedali Civili, CIC 288, T Izzi (12, 0/12)  
 Brescia, Università, CIC 741, F Porta (missing)  
 Cagliari, Ospedale Oncologica, CIC 791, G Broccia, P Dessalui (32, 0/32)  
 Cagliari, II Clinica Pediatrica, CIC 812, F Argioli, A Cao (12, 10/2)  
 Catania, Università, CIC 792, R Giustolisi, E Cacciola (7, 0/7)  
 Cremona, Medicina II, CIC 226, A Manna (20, 3/17)  
 Firenze, Policlinico di Careggi, CIC 304, A Bosi (62, 29/33)  
 Forlì, Morgagni-Pierantoni Hospital, CIC 298, D Amadori, B Dino (9, 0/9)  
 Genova, Ospedale S. Martino, CIC 217, A Bacigalupo, A Carella, G Santini (170, 80/90)

Genova, Istituto Giannina Gaslini, CIC 274, G Dini (35, 16/19)  
 Genova, Università, CIC 139, F Patrone (30, 0/30)  
 Milano, Istituto Scientifico HS Raffaele, CIC 813, C Bordignon (37, 9/28)  
 Milano, Istituto Nazionale Tumori, CIC 616, A Gianni (55, 0/55)  
 Milano, Università, CIC 265, G Lambertenghi Delilieri (33, 16/17)  
 Milano, Ospedale di Niguarda, CIC 294, P Marengo, R Caroli (17, 5/12)  
 Milano, Istituto Europeo di Oncologia, CIC 331, G Martignelli (33, 0/33)  
 Monza, Ospedale S. Gerardo, CIC 279, C Uderzo (20, 18/2)  
 Napoli, Università, CIC 766, B Rotoli, C Selleri, G De Rosa (21, 8/13)  
 Nuoro, Ospedale San Francesco, CIC 793, A Gabbas, A Palmas (5, 0/5)  
 Padova, Centro Leucemie Infantili, CIC 285, C Messina (22, 11/11)  
 Padova, Centro Oncologia Regionale, CIC 319, L Salvagno (missing)  
 Palermo, Trabianto Policlinico, CIC 814, A Cajazzo (22, 3/19)  
 Palermo, Ospedale V. Cervello, CIC 392, I Majolino (57, 15/42)  
 Parma, Università degli studi, CIC 245, V Rizzoli (10, 0/10)  
 Pavia, Policlinico S Matteo, CIC 286, C Bernasconi (64, 27/37)  
 Pavia, Policlinico St Matteo, CIC 557, F Locatelli (44, 28/16)  
 Pavia, Fondazione Clinica del Lavoro, CIC 771, P Pedrazzoli, G Robustelli della Cuna (31, 0/31)  
 Perugia, Silvestrini Hospital, CIC 815, A Amici (9, 6/3)  
 Perugia, Policlinico Monteluca, Università, CIC 794 MF Martelli, F Aversa (91, 53/38)  
 Perugia, Policlinico Monteluca, F Grignani (19, 0/19)  
 Pesaro, Ospedale, CIC 529, G Lucarelli (66, 60/6)  
 Pescara, Ospedale civile, CIC 248, P di Bartolomeo (55, 28/27)  
 Pisa, Istituto di Clinica Pediatrica, CIC 795, P Macchia (21, 8/13)  
 Pisa, St Chiara Hospital, CIC 320, P-F Franco (missing)  
 Ravenna, Ospedale civile, CIC 306, G Rosti (58, 0/58)  
 Reggio di Calabria, Azienda Ospedale 'Riuniti e Morelli', CIC 587, P Iacopino (53, 11/42)  
 Roma, Università S Eugenio, CIC 756, S Amadori, L Cudillo (53, 12/41)  
 Roma, Università 'La Sapienza', CIC 232, W Arcese, F Mandelli, G Meloni (101, 40/61)  
 Roma, Università Cattolica, CIC 307, S Cuore, S Sica, G Leone (26, 11/15)  
 Roma, Ospedale Bambino Gesù, CIC 796, G Deb (7, 0/7)  
 Roma, Ospedale S Camillo, CIC 287, A De Laurenzi (36, 11/25)  
 San Giovanni Rotondo, Hospital Casa Sollievo Sofferenza (Onco), CIC 314, G Lelli (23, 0/23)  
 San Giovanni Rotondo, Hospital Casa Sollievo Sofferenza (Hem), CIC 526, MM Greco (28, 1/27)  
 Siena, Ospedale Sclavo, CIC 321, F Lauria (5, 0/5)

Torino, S, Giovanni Antica Sede Hospital, CIC 322, M Airoldi (missing)  
 Torino, Ospedale S Giovanni, M Falda (60, 26/34)  
 Torino, Clinica Medica Università, CIC 231, M Aglietta (missing)  
 Torino, Dept. of Pediatrics, University, CIC 305, E Madon, R Miniero (25, 10/15)  
 Trieste, 1st per l'Infanzia Clinica Pediatrica, M Andolina, A de Manzini (15,11/4)  
 Udine, Policlinico Universitario, CIC 705, M Baccarani, R Fanin (60, 12/48)  
 Verona, Policlinico di Borgo Roma, CIC 623, G Perona (41, 10/31)  
 Verona Policlinico di Borgo Roma (onco), GL Cetto (missing)  
 Vicenza, Ospedale S Bortolo, CIC 797, R Raimondi, F Rodeghiero (32, 10/22)

*Latvia: no report*

*Liechtenstein: no report*

*Lithuania: no report*

*Luxemburg (1 team; 29, 1/28)*

Centre Hospitalier, M Dicato (29, 1/28)

*Macedonia: no report*

*Malta: no report*

*Moldova: no report*

*Monaco: no report*

*The Netherlands (13 teams; 492, 212/280)*

Amsterdam, Free University Hospital, CIC 588, G.M. Ossenkoppelle (54, 0/54)  
 Amsterdam, The Netherlands Cancer Institute, S Rodenhuis (39, 0/39)  
 Amsterdam, Emma Kinderziekenhuis, Academic Medical Center, CIC 247, H v den Berg, H Behrendt (5, 0/5)  
 Amsterdam, Emma Ziekenhuis, Academic Medical Center, CIC 247, J van der Lelie (21, 7/14)  
 Groningen, University Hospital, (onco), E de Vries (18, 0/18)  
 Leiden, University Medical Centre, CIC 203, J Vossen, R Willemze, WE Fibbe, JJ van Rood (98, 78/20)  
 Maastricht, University Hospital, CIC 565, HC Schouten (30, 4/26)  
 Nijmegen, University Hospital, CIC 237, A Schattenberg, T de Witte, J Groot, L Beek (86, 44/42)

Rotterdam, Dr Daniel den Hoed Cancer Center, CIC 246, JJ Cornelissen (58, 38/20)  
Rotterdam, University Hospital, CIC 508, MR Schipperus (10, 0/10)  
The Hague, Leyenburg Hospital, CIC 547, PW Wijermans, HL Haak (8, 0/8)  
Utrecht, Wilhelmina Kinderziekenhuis, CIC 247, ER de Graeff-Meeder, NM Wulffraat, M Bierings (8, 7/1)  
Utrecht, University Hospital, CIC 239, LF Verdonck (57, 34/23)

*Norway (2 teams; 70, 35/35)*

Oslo, Rikshospitalet, CIC 235, D Albrechtsen (39, 35/4)  
Oslo, The Norwegian Radium Hospital, CIC 782, S Kvaloy (31, 0/31)

*Poland (8 teams; 187, 68/119)*

Gdansk, Medical University, CIC 799, A Hellmann (21, 9/12)  
Katowice, Silesian Medical Academy, CIC 677, J Holowiecki (64, 14/50)  
Poznan, Medical Academy, CIC 730, J Hansz (30, 10/20)  
Poznan, Institute of Pediatrics, CIC 841, J Wachowiak (10, 10/0)  
Warsaw, Central Clinical Hospital; CIC 816 K Sulek (4, 2/2)  
Warsaw, Curie Institute, J Walewski (9 patients referred to CIC 677 and CIC 799)  
Wroclaw, University of Medicine, Dept. of Children, CIC 817, J Boguslawska-Jaworska (20, 6/14)  
Wroclaw, K Diuske Hospital, CIC 538, A Lange (38, 17/21)

*Portugal (4 teams; 179, 62/117)*

Lisbon, Instituto Portugues de Oncologia, CIC 300, M Abecasis, F Campilli (78, 23/55)  
Lisbon, Hospital de Santa Maria, CIC 636, J Alves do Carmo, F de Lacerda (41, 15/26)  
Porto, Instituto Português de Oncologia, CIC 291, F Campilho (54, 24/30)  
Porto, Hospital S Joao, CIC 329, F Principe (6, 0/6)

*Romania: no report*

*Russia (5 teams; 65, 9/56)*

Moscow, Institute of Biophysics, AE Baranov (8, 0/8)  
Moscow, Cancer Research Center, CIC 757, Y Chervonobab (11, 0/11)  
Moscow, Research Hematology Center of RAS, VG Savtchenko (8, 3/5)  
St. Petersburg, Research Institute of Hematology, CIC 724, KM Abdulkadirov (10, 2/8)  
St. Petersburg, All-Russia Centre of Lab. Biodozymetry, R Fedortseva (missing)  
St. Petersburg, City BMT, CIC 725, BV Afanasiev, L Zubarovskaya (28, 4/24)

*San Marino: no report*

*Saudi Arabia (1 team; 16, 15/1)*

Riyadh, Armed Forces Hospital, CIC 818, M Aldouri (16, 15/1)  
Riyadh, The King Faisal Hospital, CIC 397, P Ernst (missing)

*Slovakia (3 teams; 70, 19/51)*

Bratislava, 2nd Children's Clinic, University Hospital, J Lukac (8, 4/4)  
Bratislava, University Hospital, CIC 610, M Mistrik (25, 15/10)  
Bratislava, National Cancer Institute, CIC 560, P Fuchsberger (37, 0/37)

*Slovenia (1 team; 9, 6/3)*

Ljubljana, University Medical Centre, CIC 640, J Pretnar (9, 6/3)

*Spain (60 teams; 1976, 397/1579)*

Alicante, Hospital General, C Rivas-Gonzales (4; 0/4)  
Barcelona, Santa Cruce (peds), CIC 260, I Badell Serra, J Cubells-Riero, A Domingo Albos (18, 6/12)  
Barcelona, Santa Creu (ads), CIC 250, A Domingo Albos, C Sola (90, 13/77)  
Barcelona, Hospital Pilar, J Estape, JJ Grau (16, 0/16)  
Barcelona, Hospital Duran i Reynals, CIC 759, A Granena (64, 13/51)  
Barcelona, Hospital General 'Vall d'Hebron', CIC 583, A Julia Font (40, 7/33)  
Barcelona, Hospital M Infantil, CIC 527, J Ortega (33, 18/15)  
Barcelona, Hospital Clinic, CIC 214, E Montserrat, E Carreras (86, 43/43)  
Barcelona, Clinica Corachan, CIC 758, P Vivancos (11, 0/11)  
Barcelona, Instituto Dexeus, M Ribas-Mundo, A Domingo Albos (12, 0/12)  
Cadiz, Hospital del SAS de Jerez, A Leon (56, 1/55)  
Canary Isles, Hospital Insular Las Palmas, F Fernandez-Fuentes, J Gonzalez-San Miguel (7, 0/7)  
Canary Isles, Hospital Universitario de Canarias, Santa Cruz de Tenerife, L Hernandez Nieto, MT Hernandez Garcia (8, 0/8)  
Canary Isles, Hospital Nostra Senora del Pino, Las Palmas, JJ Malcorra, R Mataix, C Campo (31, 10/21)  
Cordoba, Hospital Reina Sofia, CIC 238, A Torres Gomez (33, 20/13)  
Cruces-Barakaldo, Hospital de Cruces, I Zuazua-verde (15, 0/15)  
Galdakao, Hospital, Dr Koldo-Atucha (6, 0/6)  
Granada, Hospital Virgen de la Nieves, JM de Pablos (25, 1/24)  
La Coruna, Hospital Materno Infantil Juan Canalejo, FJ Batlle, C Ramirez, P Torres, R Varela (22, 1/21)

Lérida, Hospital Arnan de Villanova, J Macia (9, 0/9)  
Lugo, Hospital Xeral-Calde, M Gonzales-Lopez (7, 0/7)  
Madrid, Clinica La Luz, H Cortés-Funes, J Hornedo (17, 0/17)  
Madrid, Hospital Universitario San Carlos, CIC 733, J Diaz Mediavilla, L Llorente (28, 0/28)  
Madrid, Hospital Ruber Internacional, J Diaz Mediavilla, (16, 0/16)  
Madrid, Hospital Gregorio Maranon, CIC 819, JL Diez Martin (6, 1/5)  
Madrid, Clinica Ruber, JM Fernandez-Ranada, Escudero (39, 0/39)  
Madrid, Hospital de la Princesa, CIC 236, JM Fernández Rañada, A Figuera, A Alegre (93, 43/50)  
Madrid, Clinica Puerta de Hierro, CIC 728, MN Fernandez (41, 18/23)  
Madrid, Hospital General La Paz, F Hernandez Navarro (79, 13/66)  
Madrid, Hospital Doce de Octubre (ads, peds, onco), J Lahuerta, J Lopez Perez, J Hornedo, H Cortés Funes (93, 4/89)  
Madrid, Hospital Nino Jesus, CIC 732, LM Madero (38, 15/23)  
Madrid, Hospital Univ. San Carlos, CIC 733, M Martin, E Diaz-Rubio, A Casado, JA Lopez-Martin (41, 0/41)  
Madrid, Clinica San Camillo, M Martin-Jimenez (12, 0/12)  
Madrid, Hospital La Paz Infantil, CIC 734, A Martinez-Rubio, A Sastre, P Garcia-Miguel (26, 8/18)  
Madrid, Hospital Ramon y Cajal, CIC 615, J Odriozola, J Pérez de Oteyza, J Lopez, J Garcia Larana (40, 8/32) and (peds) A Munoz Villa, E Otheo, MS Maldonado (17, 6/11)  
Madrid, Fundacion Jimenez Diaz, J Vincente Fernandez, L Barbolla (21, 0/21)  
Madrid, Hospital Militar Gomez Ulla, F Sancho-Cuesta (2, 0/2)  
Malaga, Hospital Regional, CIC 576, J Maldonado (43, 16/27)  
Murcia, Hospital Virgen de la Arrivxaca, CIC 323, R Candell Parra (12, 0/12)  
Murcia, Hospital General, CIC 735, V Vincente-Garcia, JM Moraleda, I Heras (39, 8/31)  
Oviedo, Hospital Covadonga, CIC 642, D Carrera Fernandez, C Rodriguez Pinto (18, 4/14)  
Palma de Mallorca, Hospital Son Dureta, CIC 722, J Besalduch, HS. Dureta (30, 6/24)  
Palma de Mallorca, Policlinica Miramar, J Besalduch, A Sampol (10, 1/9)  
Pamplona, Hospital Provincial de Navarra, CIC 577, J Gastearena, E Pérez Equiza, MJ Uriz Pascual (30, 0/30)  
Pamplona, Clinica Universitario de Navarra, CIC 737, J Rifon (10, 2/8)  
Pontevedra, Hospital Montecelo, CIC 549, M Constela (17, 0/17)  
Salamanca, Complejo Hospital, CIC 727, D Caballero (69, 15/54)  
San Sebastian, Hospital Nostra Senora de Aranzazu, CIC 598, J Marin (65, 5/60)  
Santander, Hospital Universitario M de Valdecilla, CIC 242, A Iriondo, E Conde, E Bureo, A Zubizarreta-Pina (64, 20/44)

Sant Cugat del Vallés, Hospital General de Catalunya, M Sureda-Gonzales (5, 0/5)  
Santiago de Compostela, Hospital Xeral de Galicia, CIC 570, JL Bello (13, 3/10)  
Sevilla, Hospital Universitario Virgen del Rocío, CIC 769, JM Rodriguez Fernandez (42, 14/28)  
Sevilla, Hospital Univ. Virgen Macarena, CIC 629, L Errazquin (missing)  
Valencia, Hospital Universitario La Fe (peds), CIC 653, V Castel, Dr Esquembre-Menor (16, 2/14)  
Valencia, Hospital Clinico Universitario, CIC 282, J Garcia-Conde, C Solano (90, 18/72)  
Valencia, Instituto Valenciano de Oncologia, V Guillen, J Palau (25, 0/25)  
Valencia, Hospital Universitario La Fe, CIC 663, MA Sanz, GF Sanz (74, 31/43)  
Valladolid, Hospital Rio Hortega, (missing)  
Vigo, Hospital Xeral-Cies, A Martinez-Dalmau (19, 0/19)  
Zaragoza, Hospital Miguel Servet, M Giralt, G Pérez-Lugmus, D Rubio-Félix (41, 3/38)  
Zaragoza, Clinico Universitario Lozano Blesa, A Tres, Palomera (42, 0/42)

*Sweden (9 teams; 386, 110/276)*

Goteborg, Medical Clinic, CIC 715, J Carneskog (42, 14/28)  
Goteborg, East Hospital, CIC 289, A Fath, S Rodjer (17, 8/9)  
Huddinge, Hospital, CIC 212, P Ljungman (90, 48/42)  
Linköping, University Hospital, CIC 740, G Juliusson (39, 3/36)  
Lund, University Hospital, CIC 283, AN Bekassy (53, 9/44)  
Örebro, Medical Center Hospital, CIC 738, U Tidefelt (8, 0/8)  
Stockholm, Karolinska Hospital, CIC 626, M Björkholm (27, 0/27)  
Umea, Norrland University Hospital, CIC 731, E Löfvenberg (20, 0/20)  
Uppsala, University Hospital, CIC 266, B. Simonsson, K Carlson (90, 28/62)

*Switzerland (8 teams; 243, 69/174)*

Aarau, Kantonsspital, CIC 316, M Wernli (13, 0/13)  
Basel, Kantonsspital, CIC 202, B Speck, A Gratwohl (33, 20/13)  
Bellinzona, Ospedale San Giovanni, F Cavalli, M Ghiellini (14, 0/14)  
Berne, Inselspital, CIC 221, A Tobler, K Leibundgut (28, 0/28)  
Geneva, Hôpital Cantonal Universitaire, CIC 261, B Chapuis, J Humbert (25, 20/5)  
Lausanne, CHUV, CIC 820, D Schapira, T Kovacovics, N Nenadov-Beck (52, 0/52)  
St Gallen, Kantonsspital, CIC 324, U Hess (13, 0/13)  
Zurich, University Hospital, CIC 208/CIC 646, J Gmür, R Stahel, R Seger (65, 29/36)

*Turkey (8 teams; 102, 70/32)*

Ankara, Ibn-Sina Hospital, CIC 617, H Koc (29, 17/12)  
Ankara, Hacettepe University, CIC 292, K Oezerkan (2, 2/0)  
Ankara, Childrens Hospital Hacettepe University, A Tuncer (missing)  
Balcali, Hospital, CIC 821, A Tanyeli (3, 2/1)  
Istanbul, Marmara University, Altunizade, CIC 714, T Akoğlu (6, 4/2)  
Istanbul, Cerrahpasa Medical School, CIC 761, B Ferhanoglu, T Soysal, Z Baslar (16, 13/3)  
Istanbul, Tip Fakultesi, CIC 762, G Gedikoglu (17, 10/7)  
Istanbul, Medical Faculty, CIC 760, Y Tangün (22, 18/4)  
Izmir, SSK Tepecik Hastanesi, S Gaglayan (7, 4/3)

*Ukraine: no report*

*United Kingdom (46 teams; 1736, 565/1171)*

Bangor, Gwynedd Hospital, CIC 736, H Parry (6, 0/6)  
Bath, Royal United Hospital, CIC 619, JG Smith (11, 0/11)  
Belfast, Royal Victoria Hospital, CIC 268, F Jones (21, 7/14)  
Belfast, City Hospital, CIC 753, TCM Morris (20, 1/19)  
Birmingham, Ladywood Middleway, CIC 781, PJ Darbyshire, MW Williams (26, 19/7)  
Birmingham, Queen Elizabeth Hospital, CIC 387, JA Holmes (41, 8/33)  
Birmingham, Heartlands Hospital, CIC 284, DW Milligan (30, 6/24)  
Blackpool, Victoria Hospital, NG Flanagan, Dr Kelsey (missing)  
Bournemouth, Royal Bournemouth Hospital, CIC 765, H Myint (12, 0/12)  
Bristol, Royal Hospital for Sick Children, CIC 386, JM Cornish (73, 63/10)  
Bristol, Southmead Hospital, J Hows, MG Rainey, CIC 628 (9, 0/9)  
Cambridge, Addenbrooke's Hospital, CIC 566, RE Marcus (57, 12/45)  
Cardiff, University of Wales, CIC 303, CH Poynton (70, 18/52)  
Clydebank, HCL International Medical Centre, CIC 317, D Spence (10, 6/4)  
Coventry, Walsgrave Hospital, R Harris (missing)  
Edinburgh, Royal Infirmary, CIC 228, AC Parker, PS Ganly, MJ Mackie, P Johnson (17, 5/12)  
Glasgow, Royal Infirmary, CIC 244, IM Franklin (64, 31/33)  
Glasgow, The Western Infirmary, CIC 325, T Fitzsimons, (missing)  
Harrow, Northwick Park Hospital, CIC 802, CDL Reid (0, 0/0)  
Leeds, General Infirmary; CIC 719, JA Child (47, 0/47)  
Leeds, St James's University Hospital, D Barnard CIC 254 (missing)  
Leicester, Royal Infirmary, CIC 713, RM Hutchinson (33, 14/19)  
Liverpool, Royal Liverpool University Hospital, CIC 501, RE Clark (52, 14/38)

London, Hammersmith and Charing Cross Hospital, CIC 205 & CIC 510, JM Goldman, D Samson (64, 54/10)  
London, University College Hospital, CIC 224, AH Goldstone (159, 31/128)  
London, Oncology Marrow Transplantation Group, CIC 263, PJ Gravett (8, 0/8)  
London, St George's Hospital, CIC 539, J Marsh, S Ball, EC Gordon-Smith (14, 9/5)  
London, The Royal London Hospital, Whitechapel, CIC 269, AC Newland (60, 11/49)  
London, King's College, CIC 763, A Pagliuca, GJ Mufti (33, 15/18)  
London, Royal Marsden Hospital, R Powles, J Mehta (158, 51/107)  
London, Royal Free Hospital, HG Prentice, M Potter (45, 24/21)  
London, St Bartholomew's Hospital, CIC 768, A Rohatiner (40, 2/38)  
London, Guy's Hospital, CIC 721, S Schey (33, 3/30)  
London, Institute of Child Health, CIC 243, P Veys, IM Hann (46, 40/6)  
Manchester, Christie Hospital, G Morgenstern (90, 5/85)  
Manchester, Royal Children's Hospital, CIC 521, AM Will (22, 18/4)  
Manchester, The Royal Infirmary, JA Yin (27, 15/12)  
Manchester, Trafford General Hospital, PA Carrington (14, 0/14)  
Newcastle upon Tyne, Royal Victoria Infirmary, CIC 276, SJ Proctor, P Taylor, A Cant, ADJ Pearson (65, 28/37)  
Nottingham, City Hospital, CIC 717, N Russell (70, 24/46)  
Oxford, John Radcliffe Hospital, Headington, CIC 255, TJ Littlewood, C Bunch, C Mitchell (36, 11/25)  
Plymouth, Derriford Hospital, CIC 823, MD Hamon (25, 4/21)  
Poole, Dorset Cancer Centre, CIC 580, A Bell (22, 4/18)  
Sheffield, Children's Hospital, CIC 778, E Vandenberghe, JS Lilleyman, AJ Vora (26, 7/19)  
Somerset, Taunton and Somerset Hospital, SA Johnson, S Rule (11, 0/11)  
Southampton, Royal South Hants Hospital, A Smith, A Duncombe (14, 3/11)  
Southampton, General Hospital, CIC 704, J Sweetenham, J Kohler (40, 0/40)  
Southampton, General Hospital (peds), J Kohler (4, 2/2)  
Stoke-on-Trent, North Staffordshire Royal Infirmary, P Chipping (5, 0/5)  
Wakefield, Pinderfield's General Hospital, CIC 764, C Galvin (6, 0/6)

*Yugoslavia (Serbia and Montenegro) (3 teams; 29, 13/16)*

Belgrade, Clinical Centre of Serbia, M Colovic (11, 5/6)  
Belgrade, Military Medical Academy, M Malesevic (11, 5/6)  
Novi SAD, Institute of Internal Diseases, CIC 655, D Pejcin (7, 3/4)

Latest changes: 11 March 98

Missing = no data received.