

## Special report

# Haematopoietic stem cell transplantation (HSCT) in Europe 2002. Changes in indication and impact of team density. A report of the EBMT activity survey

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### Summary:

**This 2002 European Group for Blood and Marrow Transplantation (EBMT) activity survey concentrates on current status, increase and decrease in haematopoietic stem cell transplantation (HSCT) activity in Europe and investigates the association of transplant rates with team density. In 2002, there were 20 207 HSCT, 6915 allogeneic (34%), 13 292 autologous (66%) and 3947 additional re- or multiple transplants collected from 586 centres in 39 European countries. Main indications were leukaemias (6523 (32%; 76% allogeneic)); lymphomas (10 760 (53%; 92% autologous)); solid tumours (1913 (9%; 92% autologous)) and nonmalignant disorders (874 (4%; 92% allogeneic)). Compared to 2001, there were increases (>10%) for AML, ALL 1st CR, CML not 1st cP, MDS, SAA and CLL in allogeneic HSCT and for MDS, Ewing's sarcoma, soft-tissue sarcoma and ovarian cancer in autologous HSCT. Decreases (>10%) were observed in autologous HSCT for acute leukaemias beyond 1st CR, CML cP, glioma, breast cancer and lung cancer. Correlation of transplant rates (number of transplants per 10 million inhabitants) with team density (number of transplant teams per 10 million inhabitants) suggests different diffusion patterns for autologous compared to allogeneic HSCT. These data describe current practice for blood and marrow transplantation in Europe and give some hints about mechanisms involved in HSCT rates.**

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Haematopoietic stem cell transplantation (HSCT) has seen a rapid increase and substantial change over the last decade. It is an established therapy for many severe acquired or congenital disorders of the haematopoietic system and for chemosensitive, radiosensitive or immunosensitive malignancies. Haematopoietic stem cells from bone marrow, peripheral blood or cord blood are used as the stem cell source. They are derived for autologous use from the patients themselves. Donors for allogeneic HSCT include HLA-identical siblings, other family members or unrelated volunteers from one of the increasing worldwide donor pools or cord blood banks.<sup>1–4</sup>

There are many reasons for this increase of HSCT in Europe. It is based on increased numbers of HSCT in teams already active in 1990<sup>5</sup> as well as on an increase in transplant teams and an extension of transplant activity to countries with previously none or limited numbers of active transplant teams. Numbers of HSCT did not increase at the same rate for autologous and allogeneic HSCT. They did not increase for all indications alike.<sup>6,7</sup> Specifically, numbers of autologous HSCT for solid tumours declined after a peak in 1997 almost as rapidly as they had previously increased. They were substituted for by increasing numbers of autologous HSCT for lymphoproliferative disorders. For allogeneic HSCT, there remains a steady increase in transplants for all indications with one major exception. Numbers of transplants for CML have been declining since 1999.<sup>8,9</sup> Such changes in transplant numbers and transplant rates require explanations and warrant studies to examine the factors bringing about such changes. We had previously described a correlation between team density (number of transplant teams per 10 million inhabitants) and transplant rates (number of transplants per 10 million inhabitants).<sup>10</sup> We made use of the sequential European Group for Blood and Marrow Transplantation EBMT activity surveys to re-examine in more detail the dynamics of the diffusion of HSCT within European countries and the relationship between team density and changes in transplant activity. In parallel, we describe current status and the changes in indication from the preceding year.

## Patients and methods

### Data collection and validation

Data collection is based on the EBMT activity surveys introduced in 1990.<sup>5</sup> All EBMT members and affiliated nonmembers are requested annually to report on a survey sheet the numbers of new patients by indication, stem cell source and donor type. In addition, the form collects additional generic information on the numbers of additional re- or multiple transplants, on the percentage of cord blood HSCT and, since 1999, on the percentage of transplants with reduced-intensity conditioning (RIC HSCT).

The EBMT survey, which was adopted by the General Assembly as a mandatory self-reporting system, forms an integral part of a prospective quality assurance programme (<http://www.EBMT.org>). The latter includes revalidation of a computer print-out of entered data by reporting teams, crosschecking with national transplant registries and onsite visits.

### Teams

In all, 636 teams in 39 European countries were contacted for the 2002 report, of which 586 reported their numbers. In total, 24 reported to be inactive. This corresponds to a 92% return rate and includes 465 of the 473 active EBMT member teams. A total of 26 teams known by the investigators to have been performing HSCT in 2002 were also contacted, but chose not to reply or for unknown reasons failed to do so, despite several efforts to reach them. No major transplant team in Europe is missing from this list.

Teams contacted are listed in the Appendix in alphabetical order according to country, city and EBMT centre code. We received information that in 2002 no blood or marrow transplants were performed in these European countries: Albania, Andorra, Armenia, Azerbaijan, Bosnia-Herzegovina, Georgia, Iceland, Liechtenstein, Malta, Moldavia, Monaco, San Marino and the Vatican.

### Definitions

Transplants are defined as the infusion of haematopoietic stem cells following a conditioning regimen with the intention of replacing the existing haematopoiesis by injected stem cells.<sup>5</sup>

First transplants refer to the first transplantation of haematopoietic cells and full information is collected only for first transplants. Therefore, each patient is counted only once, regardless of the number of transplant procedures, thus preventing multiple reporting.

Additional procedures, such as re- or multiple transplants were collected in total, not specified by disease, to receive an estimate of the absolute number of HSCT procedures performed during the year 2002. Retransplants refer to a situation where recipients receive a second HSCT for relapse or rejection of the graft, multiple transplants refer to a planned programme of sequential HSCT. This is the same for allogeneic and autologous HSCT. Owing to its

design, the survey cannot distinguish between retransplants and sequential transplants for preceding autologous or allogeneic HSCT. The criteria for RIC HSCT were not defined but left to the individual institution since no consensus has yet been achieved.<sup>11</sup>

Donor lymphocyte infusions were not considered as transplants in this setting, although general information on the number of new patients treated with DLI was collected from all institutions.

### Team density, transplant rates and diffusion of technology

Transplant rates were defined as the number of HSCT per 10 million inhabitants. They were computed as previously defined for each year, disease indication, donor type and country. For each disease indication transplant rates were assessed for all HSCT and separately for autologous, allogeneic and unrelated HSCT and for RIC allogeneic HSCT, DLI and cord blood HSCT.<sup>10</sup> Transplant rates refer to the number of transplants in a given country compared to its own population. The survey cannot make adjustments for patients who cross borders and receive their HSCT in a foreign country.

Team density was defined as the number of transplant teams per 10 million inhabitants. Team density was calculated concerning teams performing both allogeneic and autologous HSCT and for teams performing autologous HSCT only.

Population data were obtained from the US census office (<http://www.census.gov>). We measured the diffusion of HSCT technology by comparing transplant rates and team density. Diffusion was defined as the dissemination of a technological innovation in a given social system over a particular period of time according to Roger's characterisation.<sup>12</sup>

### Statistical analysis

Different descriptive statistical methods were used to analyse the data. The mean, median and standard deviations of numerical variables were calculated on an Excel spreadsheet. The relationship between team size and total transplants was described with a Lorenz curve and the degree of inequality in the relative distribution was measured with the Gini coefficient. A Lorenz curve is a way of graphically presenting a distribution and the Gini coefficient is a numerical representation of the degree of inequality in a distribution that can be derived directly from the Lorenz curve and measures the area between the 45° line and the Lorenz curve.

Team density and transplant rates were calculated for the years 1995 and 2000 and compared by Pearson's correlation. The significance of the correlation coefficients was tested with a *t*-test.

In order to analyse the dynamic of the relationship between team density and transplant rates, we used a regression analysis of the type  $y = ax^b$ , where transplant rate is taken as dependent and 1/team density as independent variable. This nonlinear regression was then transformed to linear in the log/log space with the regression coefficients *a* and *b*. The significance of the

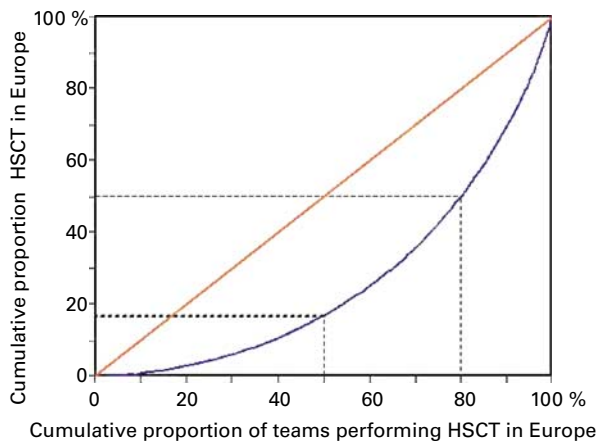
coefficient in the linear regression representing the change in correlation between team density and transplant rates, hence reflecting diffusion, as tested with a *t*-test.

## Results

### Participating teams

Of the 586 teams reporting HSCT in 2002, 331 (57%) did both allogeneic and autologous transplants, 230 (39%) restricted their activity to autologous and eight teams (1%) to allogeneic transplants only. In all, 17 teams (3%) reported not to have performed any transplants in 2002.

There was vast heterogeneity of the transplant teams with regard to size. Of all teams, 25% performed less than 10 HSCT in 2002, 6% (32 teams total) more than 100 HSCT. This unequal distribution and the cumulative proportion of HSCT transplants depending on the cumulative proportion of teams is shown in Figure 1. Teams are ranked along the horizontal axis by size (ie the number of HSCT performed in 2002). The vertical axis depicts the cumulative share of HSCT. The team in the middle of the axis represents the median and performed 25 transplants in 2002. Of all teams with transplant numbers below the median, 50% performed only about 17% of all HSCT in Europe. Of large teams, 20% performed 50% of all HSCT, vice versa. This inequality in distribution is reflected by the Lorenz curve. The deviation from equal distribution is measured by the Gini coefficient, which measures the area between the 45° line and the Lorenz curve. The Lorenz curve was highly skewed with a Gini coefficient of 0.48. With normal distribution, the Lorenz curve would follow the 45° line and the Gini coefficient would be zero. With maximum inequality one team would perform all transplants and the Gini coefficient would be 1.



**Figure 1** Numbers of HSCT by team size in Europe 2002. Data present cumulative proportion of teams (horizontal axis) and transplants (vertical axis). In all, 50% of smaller teams performed 17% of all HSCT. The 20% top size teams performed 50% of all HSCT. The red line illustrates an ideal 45° line by homogeneity. The blue line represents the Lorenz curve. The area between the red and blue lines represents the Gini coefficient or the degree of inhomogeneity (0.45).

### HSCT in 2002

**First transplants 2002.** A total of 20 207 first transplants, 6915 (34%) allogeneic and 13 292 (66%) autologous were carried out in 2002 (Table 1). This represents an increase of 539 transplants or an increase of 3% compared to 2001, when there were 19 668 first transplants (6426 allogeneic, 13 242 autologous). Numbers of allogeneic HSCT increased by 8% from 6426 in 2001 to 6915 in 2002; numbers of autologous HSCT plateaued (13 292 in 2002; 13 242 in 2001).

**Additional transplants 2002.** There were an additional 1268 retransplants (759 allogeneic/509 autologous) and 2679 multiple transplants (344 allogeneic/2335 autologous) performed at the same 586 institutions. Thus, there were a total 24 154 HSCT procedures, 8018 allogeneic (33%) and 16 136 autologous (67%) performed in 2002. This corresponds to an increase of 4% in retransplants compared to 2001 or in 53 retransplants (+86 allogeneic/−33 autologous) more and to an increase of 18% in multiple transplants compared to 2001 or in 408 multiple transplants (171 allogeneic/237 autologous) more. There was a clear increase in additional HSCT over the last years and there were more multiple procedures performed for autologous than for allogeneic transplants. In contrast, there were more retransplants in allogeneic HSCT than in autologous HSCT. The survey, however, cannot distinguish either retransplants for previous failed autografts or failed allografts.

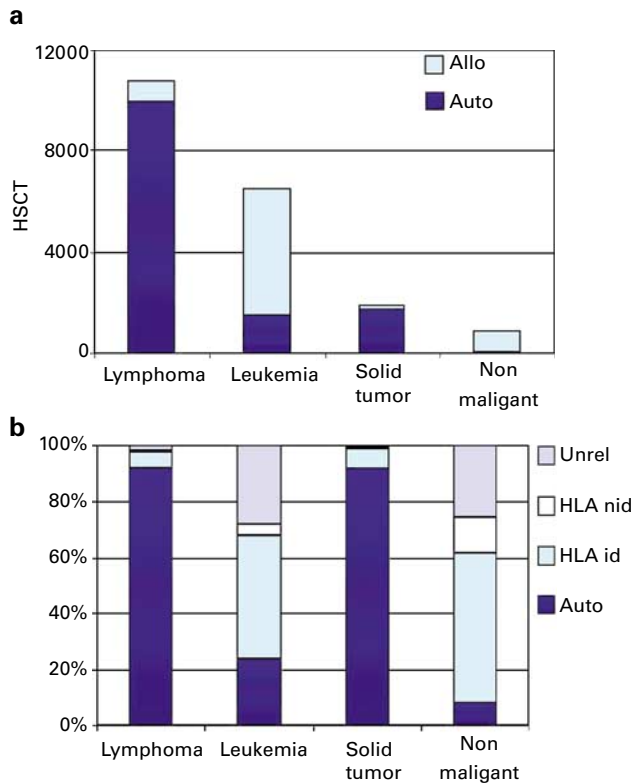
**Indications for first transplants 2002.** Specific information on disease, subtype of disease or stage as indications for HSCT is listed in detail by donor type and stem cell source in Table 1. In summary, as illustrated in Figure 2, main indications in 2002 (Figure 2a) were *lymphoproliferative disorders* with 10 760 patients (53%), 860 patients with allogeneic HSCT (8%), 9900 with autologous HSCT (92%); *leukaemias* with 6523 patients (32%), 4984 patients with allogeneic (76%), 1539 with autologous (24%) HSCT; *solid tumours* with 1913 patients (9%), 159 with allogeneic HSCT (8%), 1754 with autologous HSCT (92%) and *nonmalignant disorders* with 874 patients (4%), 805 with allogeneic HSCT (92%), 69 with autologous HSCT (8%). The latter, autologous HSCT for nonmalignant disorders predominantly include patients with autoimmune disorders. An additional 137 patients, 107 with allogeneic HSCT and 30 with autologous HSCT were listed as 'other indications'.

**Proportions of RIC allogeneic HSCT.** Since 2000, information has been collected on the percentage of RIC allogeneic HSCT in participating teams. Within this short period of time, RIC increased from 1436 in 2000 to 1927 in 2002. Compared to 2001, there was an increase of 162 or 9%. This parallels the overall increase in allogeneic HSCT. The trend appears to be stabilizing; a total of 28% of allogeneic HSCT were RIC HSCT.

**Donor type in 2002.** Of the 20 207 first transplants in 2002, 34% were allogeneic and 66% were autologous transplants.

**Table 1** Number of patients treated in Europe during the year 2002 with a first haematopoietic stem cell transplant listed by indication, donor type and stem cell source

	<i>Donor source</i>													
	<i>No. of patients</i>													
	<i>Allogeneic</i>						<i>Autologous</i>						<i>Total</i>	
	<i>Family</i>			<i>Unrelated</i>			<i>BM only</i>	<i>PBPC only</i>	<i>BM + PBPC</i>	<i>Allo</i>	<i>Auto</i>	<i>Total</i>		
	<i>HLA-id</i>		<i>Non-id</i>		<i>Twin</i>									
<i>BM</i>	<i>PBPC</i>	<i>BM</i>	<i>PBPC</i>	<i>BM</i>	<i>PBPC</i>	<i>BM</i>	<i>PBPC</i>	<i>BM only</i>	<i>PBPC only</i>	<i>BM + PBPC</i>	<i>Allo</i>	<i>Auto</i>	<i>Total</i>	
<i>Leukaemias</i>														
Acute myeloid leukaemia														
1st complete remission	252	490	3	29	4	8	77	123	93	721	23	986	837	1823
Not 1st complete remission	103	301	9	70	1	3	161	266	27	122	5	914	154	1068
Acute lymphatic leukaemia														
1st complete remission	158	196	9	16	3	3	102	119	35	167	4	606	206	812
Not 1st complete remission	138	172	11	46	3	2	173	164	10	64	2	709	76	785
Chronic myeloid leukaemia														
Chronic phase	194	244	7	8	1	2	127	104		6		687	6	693
Not 1st chronic phase	31	113	2	12	1	1	58	81		22		299	22	321
Myelodysplastic syndrome	92	241	2	30			109	133	5	39	2	607	46	653
Chronic lymphatic leukaemia	11	123	2	3		1	11	25	3	183	6	176	192	368
<i>Lymphoproliferative disorders</i>														
Myeloma	32	192		1		8	20	44	15	4336	25	297	4376	4673
Hodgkin's lymphoma	15	43	1	4			12	10	57	1294	39	85	1390	1475
Non-Hodgkin's lymphoma	74	255	2	18	1	4	41	83	63	4023	48	478	4134	4612
<i>Solid tumors</i>														
Neuroblastoma	2			1	1				30	242	2	4	274	278
Glioma		1							1	48	1	1	50	51
Soft-tissue sarcoma	1	6							1	115	3	7	119	126
Germinal tumours		2							2	319	3	2	324	326
Breast cancer		13				1				315	1	14	316	330
Ewing	2	1		1				1	5	246	5	5	256	261
Lung cancer										25		0	25	25
Ovarian cancer		10								96	3	10	99	109
Renal cancer	4	68		3				5		10		80	10	90
Melanoma	1	1		1						1		3	1	4
Colon cancer		8		1						2		9	2	11
Other solid tumours	3	17				1	1	2	8	263	7	24	278	302
<i>Nonmalignant disorders</i>														
Severe aplastic anaemia + Fanconi	160	75	8	16	3	1	59	33				355	0	355
Thalassaemia	104	44	7	9			17	5				186	0	186
SCID	27	1	17	23			20	11	1	3		99	4	103
Inborn errors	39	9	7	23			52	23				153	0	153
Autoimmune disease	4	3	1				3	1	3	59	3	12	65	77
Others	44	23	2	7			20	11		30		107	30	137
<b>Total</b>	<b>1491</b>	<b>2652</b>	<b>90</b>	<b>322</b>	<b>18</b>	<b>35</b>	<b>1063</b>	<b>1244</b>	<b>359</b>	<b>12 751</b>	<b>182</b>	<b>6915</b>	<b>13 292</b>	<b>20 207</b>



**Figure 2** Main indications and donor type of HSCT in Europe 2002. (a) Absolute numbers of HSCT by donor type and main indication. Allo = allogeneic HSCT; auto = autologous HSCT. (b) Relative proportion of donor type by main indication. Unrel = unrelated HSCT; HLA-nid = nonidentical family donor; HLA-id = HLA-identical sibling donor; auto = autologous HSCT.

The distribution of autologous and allogeneic transplants differed for the main indications (Figure 2b). For the leukaemias, 76% of the transplants were allogeneic and 24% autologous; for the lymphoproliferative disorders 8% were allogeneic and 92% autologous; for the solid tumours 8% were allogeneic and 92% autologous, and for the nonmalignant disorders 92% were allogeneic and 8% autologous. The proportion of allogeneic/autologous HSCT was similar compared to 2001 for all main indications, except for leukaemias. There is a trend towards more allogeneic HSCT (73% in 2001, 76% in 2002)

Within the main indications, there were further differences depending on subtype and stage of disease, as listed in Table 1. For example, there were more allogeneic than autologous transplants for acute lymphoid leukaemias. There were more transplants in 1st complete remission for acute myeloid leukaemia; for acute lymphoid leukaemias, there were more allogeneic transplants at later stages of the disease.

For the 6915 allogeneic first transplants, donors were an HLA-identical sibling for 4143 (60%) of the recipients, other family members for 412 (6%) of the recipients, a syngeneic twin for 53 (1%) of the recipients and an unrelated volunteer donor for 2307 (34%) of the recipients. The proportion of donor type among the allogeneic HSCT was similar compared to 2001, but with a continuing

**Table 2** Indications with major increase (>10%) or decrease (<10%) in HSCT numbers from 2001 to 2002<sup>a</sup>

Change	Allogeneic	Autologous
Increase >10%	AML, all indications ALL 1st CR CML not 1st CP MDS CLL SAA	MDS Soft-tissue sarcoma Ewing's sarcoma Ovarian cancer
Decrease >10%	—	AML not 1st CR ALL not 1st CR CML cP Glioma Breast cancer Lung cancer

<sup>a</sup>Restricted to indications with over 100 HSCT.

increase of unrelated HSCT from 2064 to 2307. Alternative donors were primarily used for patients with leukaemias or nonmalignant disorders.

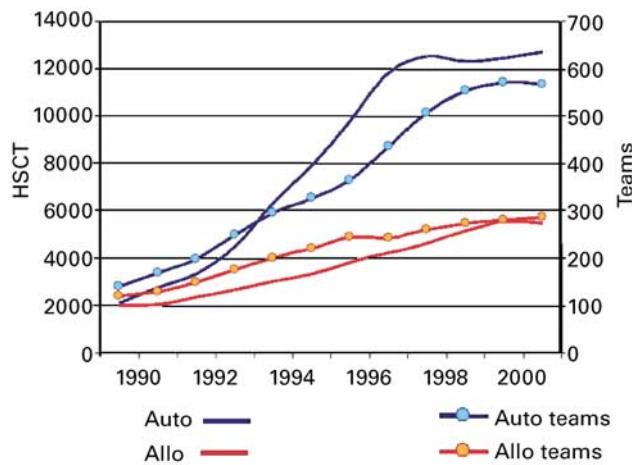
**Stem cell source in 2002.** Of the 13 292 autologous first transplants, 359 (4%) were bone marrow derived, 12 751 (97%) from peripheral blood stem cells or from combined bone marrow and peripheral blood stem cell transplants (Table 1). This reflects a further decline in the use of bone marrow for autologous HSCT. The last two groups are summarised in tables and figures as peripheral blood stem cell transplants. Of the 6915 allogeneic first transplants, 38% were bone marrow and 62% were peripheral blood stem cell transplants. In the allogeneic setting, the proportion of peripheral blood as stem cell source varied depending on donor type. The proportion of peripheral blood as stem cell source was 64% for HLA-identical sibling donor transplants, 78% for HSCT from other family members, 66% for twin donors and 54% for unrelated donors. A total of 162 allogeneic HSCT were cord blood transplants in 2002. This corresponds to 2% of all allogeneic transplants.

#### Changes in indications from 2001 to 2002

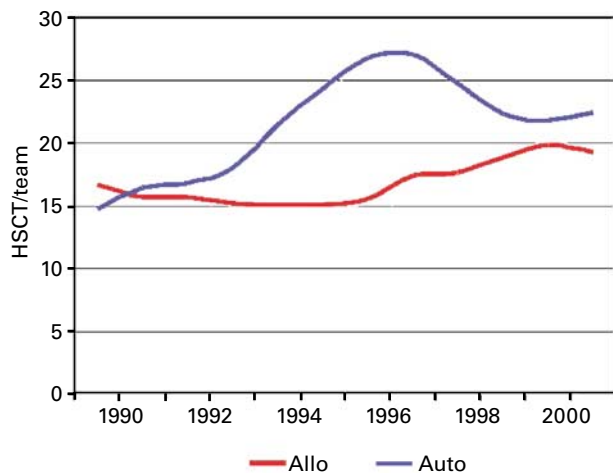
There were some changes in indications compared to the year 2001 (Table 2). A more than 10% increase in allogeneic HSCT was observed for AML, ALL 1st CR, CML not 1st cP, MDS, CLL and SAA and in autologous HSCT for MDS, soft-tissue, sarcoma, Ewing's sarcoma and ovarian cancer. A decrease of over 10% was noted in autologous HSCT for acute leukaemias not in 1st CR, CML cP, breast cancer, lung cancer and glioma. There was no decrease >10% in allogeneic HSCT in any group. The changes in CML are worth noting. There is no longer a decrease in allogeneic HSCT for CML but a change from HSCT in a chronic to a more advanced phase. Also worth noting are a small but significant number of allogeneic HSCTs for patients with solid tumours, specifically renal cell cancer, ovarian cancer, colon cancer and breast cancer.

Changes in transplant activity 1990–2002

The total numbers of transplants increased from 4 234 HSCT in 1990 to the current numbers as illustrated in Figure 3. There were similar numbers of autologous and allogeneic HSCT in 1990.<sup>10</sup> Allogeneic HSCT increased at an annual rate of about 10%. Autologous HSCT showed a rapid increase in the early 1990s and then levelled off from 1997 onwards. The numbers of teams performing autologous or allogeneic HSCT showed a similar pattern with a steady accrual of teams performing allogeneic HSCT and a rapid increase in autologous HSCT teams in the early 1990s. As a consequence, numbers of HSCT per team increase slightly at a slow steady pace for allogeneic HSCT but showed a peak in 1997 for autologous HSCT and then declined (Figure 4). Increase and decrease were different

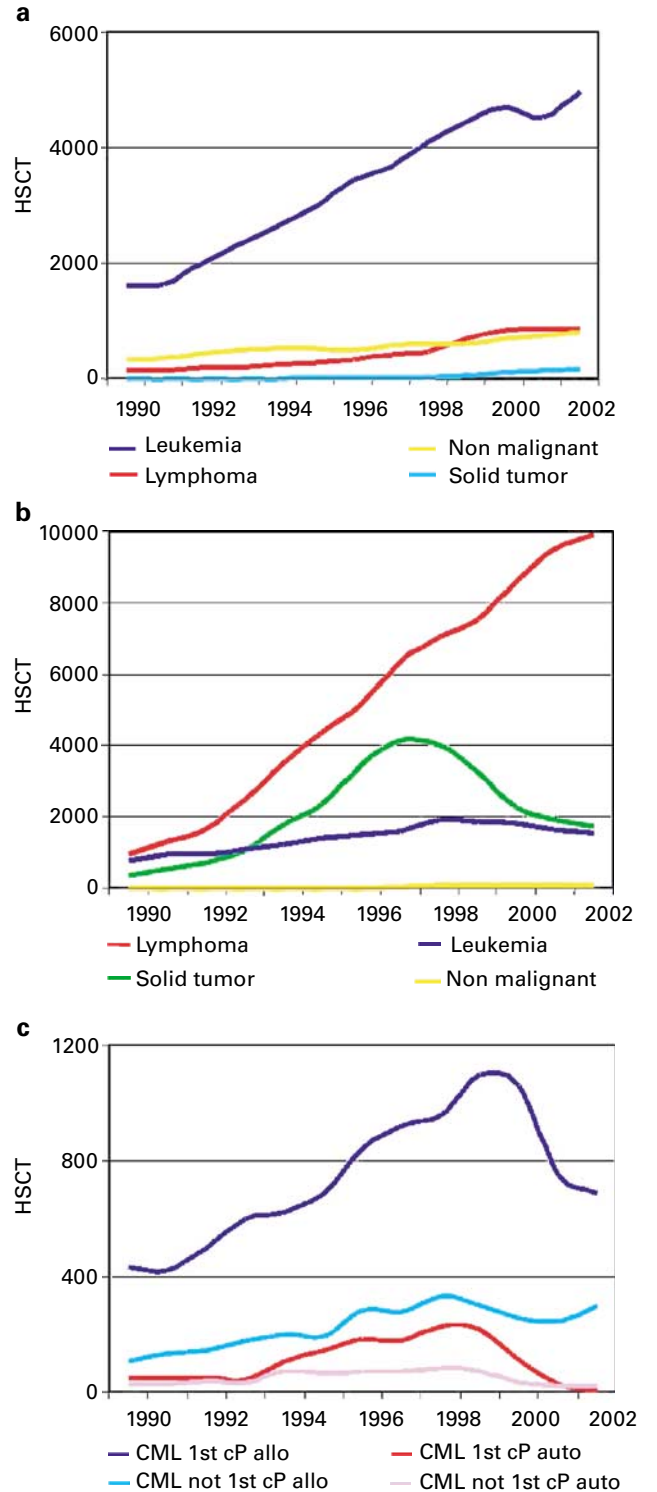


**Figure 3** Increase in HSCT and in teams in Europe from 1990 to 2002. Auto = autologous HSCT; allo = allogeneic HSCT. Auto teams = teams performing autologous HSCT (includes teams performing allogeneic HSCT). Allo teams = teams performing allogeneic HSCT (includes teams performing autologous HSCT).



**Figure 4** Numbers of HSCT per team in Europe from 1990 to 2002. Allo = number of allogeneic HSCT/team (median). Auto = number of autologous HSCT/team (median).

depending on indication and donor type (Figure 5). There was a steady, steep increase for leukaemias in allogeneic HSCT, interrupted only once in 2000/2001, a slow increase for nonmalignant indications and for lymphoproliferative disorders and a low activity for solid tumours (Figure 5a).



**Figure 5** Trends in indication for HSCT in Europe 1990–2002. (a) Allogeneic HSCT. (b) Autologous HSCT. (c) Chronic myeloid leukaemia.

A similar steady, steep increase was observed for lymphoproliferative disorders in autologous HSCT. Leukaemias and solid tumours showed increase and decrease and few HSCTs were performed for nonmalignant diseases (Figure 5b). Of specific interest is the development in CML, which showed a rapid decline in allogeneic HSCT since the year 2000 and an almost complete disappearance of autologous HSCT for this indication. However, in 2002, numbers of allogeneic HSCT for CML in the advanced phase increased again to the same numbers as observed during the peaks in 1999 (Figure 5c).

### Team density and diffusion of HSCT

In order to understand better the dynamic of transplant numbers and team numbers, as shown in Figures 3 and 4, we assessed transplant rates and team density (Figures 6 and 7) and calculated the correlation between transplant rates and team density in the years 1990, 1995 and 2000 for all countries. While the correlation was significant at a 99.0% confidence level in each year for auto HSCT –

confirming a previous finding for the years 2001<sup>10</sup> – the relationship was only significant for allo-HSCT in the year 1990 (data not shown).

The above results suggest that the diffusion of autologous HSCT and the diffusion of allogeneic HSCT did not follow the same pattern. We therefore analysed the dynamics of HSCT with a regression analysis of the type  $y = ax^b$ .

The regression with nine countries showed a good fit for autologous HSCT with a  $R^2$  of 0.8969, which indicates that the diffusion of this technology is strongly driven by team density (Figure 8a). The regression analysis showed only a marginal correlation ( $R^2$  of 0.1425) for allogeneic HSCT with an explained variance of only 14.25% (Figure 8a).

The results of the linear regression analysis confirm that they are significant for both technologies (Figure 8b). This leads to the straightforward conclusion that the growth rate of both auto- and allo-HSCT transplant rate depends linearly on the growth rate of 1/team density.<sup>1</sup> The linear association was loose for allogeneic HSCT with a different pattern of presentation, suggesting that the diffusion is driven by other factors as well.

### Discussion

This present analysis of the annual EBMT activity survey from the year 2002 yields some clarifying, but at the same time, surprising results. HSCT is an established therapy in Europe with over 20 000 such interventions annually in all major European countries.<sup>6,7</sup> Allogeneic HSCTs continue to increase with an annual rise of 5–10%, autologous HSCT plateaued at a high level. This superficially stable picture reveals much more heterogeneity when looked at in more detail. There are some rapid changes within individual indications. Moreover, thanks to an overview covering more than a decade, some mechanisms underlying these changes can be identified.

The most important statement with regard to indications is reflected by the fact that no single subgroup showed a decline in transplant numbers for allogeneic HSCT. A strong increase of more than 10% over the previous year was observed for all leukaemias and aplastic anaemia. Specifically, the decline in transplant rates for CML came to a halt and more transplants are now performed for CML in advanced phase than ever before.<sup>8,9,13–15</sup> Concerning autologous HSCT, more heterogeneity was observed. Some indications showed a strong increase, others a strong decrease. As such, breast cancer is no longer the most frequent indication for an autologous HSCT.<sup>16–18</sup> Numbers alone do not explain the reasons behind these changes. Numbers, however, leave room for interpretation. These indications with a marked increase in allogeneic HSCT were those considered as accepted indications in the field.<sup>4,6,19</sup> The extension might be due to integration of new patient categories, for example, patients at higher age within the context of RIC transplant programmes.<sup>20</sup> There is indeed a continued increase in RIC HSCT and almost one-third of allogeneic HSCTs in the year 2002 were such procedures.<sup>11,20</sup>

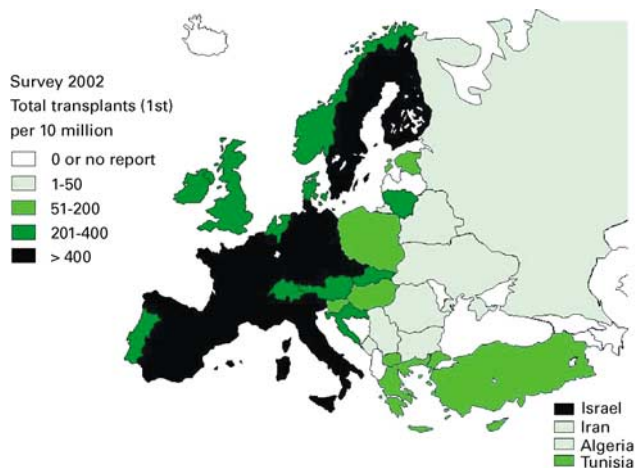


Figure 6 Transplant rates in participating European countries in 2002.

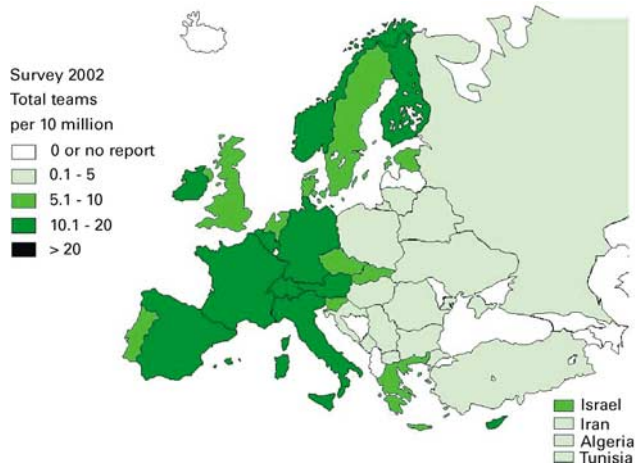
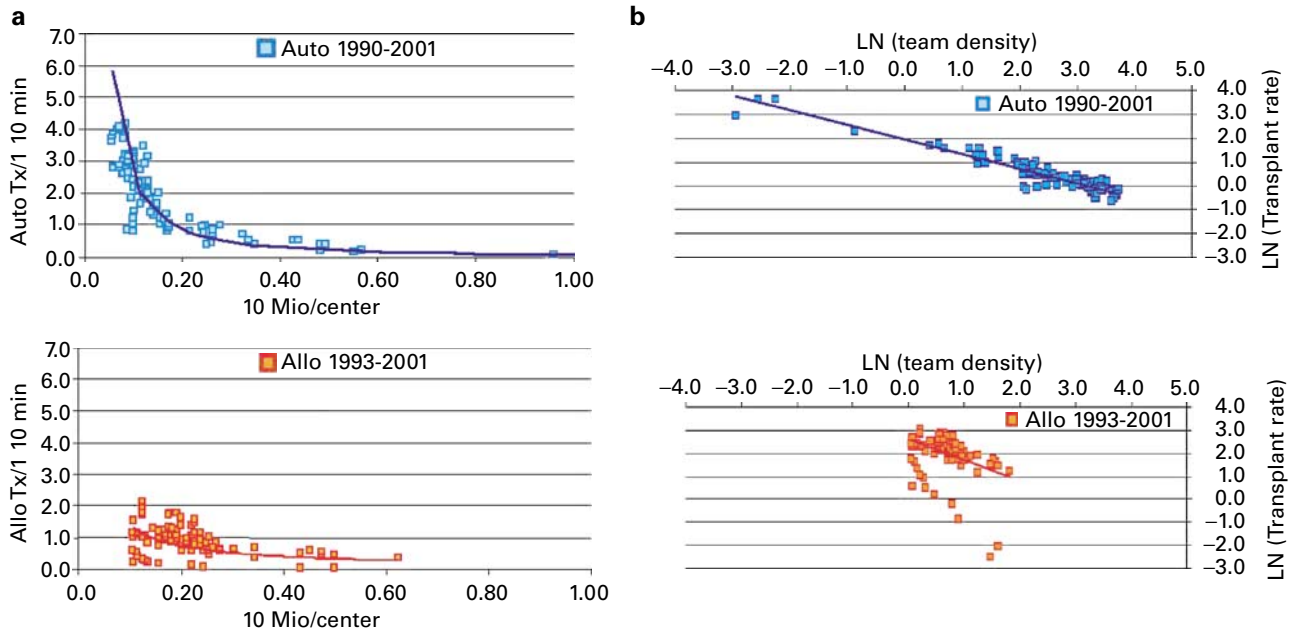


Figure 7 Team densities in participating European countries in 2002.



**Figure 8** Correlation between team density and transplant rates. (a) The graph illustrates transplant rates and the inverse of team density, for example, number of inhabitants per centre for nine selected countries in the years 1990, 1995 and 2001. Top in blue: autologous HSCT;  $y = 23.924x^{-1.4823}$ ;  $R^2 = 0.9051$ ; bottom in red: allogeneic HSCT;  $y = 13.567x^{-0.8865}$ ;  $R^2 = 0.1425$ . (b) Double logarithmic representation of inverse transplant rates and inverse team density, as presented in (a). The optical presentations visualise different diffusion patterns.

The changes in indications and the increases or decreases are more difficult to explain for autologous HSCT. Some increases might reflect situations with established indications, for example, Ewing's sarcoma,<sup>21–23</sup> some decreases might relate to ending of collaborative group study protocols.<sup>24–28</sup> Prospective controlled studies are still urgently needed for many of the disease indications. Moreover, despite several studies the situation remains unclear with regard to breast cancer. This ambiguity is illustrated by two recent publications and an editorial in the year 2003.<sup>16–18</sup> Few indications overall in solid tumours can be regarded as accepted indications outside clinical study protocols.

In this report, we strove for a better understanding of dynamics in the changes of indications for HSCT. We had previously found a clear correlation between team density and transplant rates.<sup>10</sup> We therefore looked at the pattern in diffusion of technology. This process in health-related technology in general is defined as the progress of a technical innovation in a given social system over time and encompasses instruments, equipment, drugs and procedures, as well as organisations supporting the delivery of such care.<sup>29–33</sup> This process of diffusion takes place in stages and a number of factors can facilitate or slow down this process. Economics are usually one main key factor.

In this analysis, we found a clear correlation between team density and transplant rates. This relationship was highly significant and almost linear in a logarithmic regression for autologous HSCT over the whole observation period of a decade. It was still present, but to a much lesser extent and with a skewed distribution for allogeneic HSCT. In addition, it was more pronounced for the year 1990 than for 2000 (data not shown).

These findings warrant an explanation. There are potential hypotheses to explain these differences. Most likely is that patients with defined and accepted indications, such as in allogeneic HSCT, find their way to the transplant centres independent of numbers of transplant teams. Patients with allogeneic HSCT are treated in higher numbers in the few centres available in a given country or distributed in lower numbers to the many centres. In addition, patients with clear indications for allogeneic HSCT may crossborder to centres nearby and alter the pattern of distribution. There is no way of detecting such crossborder transplants in this activity survey. Such changes across the border might be fewer for autologous HSCT. Furthermore, teams for autologous HSCT might be using their infrastructure for additional indications in autologous HSCT. This is less likely to be carried out for allogeneic HSCT. Alternatively, simple innovations spread faster than complex technologies or innovations must correspond to patients' needs. Specialists in health-care economics are now challenged to provide answers to these open questions.

As usual, the EBMT activity survey gives no results on outcome. These data are published separately and with longer follow-up. It describes current practice of HSCT specialist teams in Europe and provides a basis for health-care administrators, transplant specialists and patients for their decision-making.

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## Appendix 2002

List of transplant centres in 2002 (numbers show total number of patients with first transplants (*total number of transplants*) followed by the allografts/autografts):

**Albania:** no report

**Andorra:** no report

**Armenia:** no report

**Algeria** (one team; 129 (130), 106/23)

Alger, Centre Pierre et Marie Curie, CIC 703, R Hamladji (129 (130), 106/23)

**Austria** (15 teams; 309 (395), 119/190)

Graz, Karl Franz University Hospital (onco), CIC 278, H Samonigg, M (0 (0), 0/0)

Graz, Karl Franz University Hospital (hem), CIC 308, W Linkesch (49 (65), 12/37)

Graz, Universitäts-Kinderklinik (hem, onco), CIC 593, Ch Urban (7 (9), 3/4)

Innsbruck, Universitätsspital (hem, onco), CIC 271, G Gastl, D Nachbaur (37 (52), 18/19)

Innsbruck, Universitätsspital, Internal Medicine (onco), CIC 516, E Woell (1 (1), 0/1)

Klagenfurt, General Hospital Klagenfurt, D Geissler, M Heistingner (7 (9), 0/7)

Linz, AO Krankenhaus (onco), 1 Medizin, MA Fridrik (2 (2), 0/2)

Linz, AOK der Elisabethinen, Internal Medicine, CIC 594, D Lutz, O Krieger (35 (51), 7/28)

Salzburg, LKA Salzburg (onco), CIC 356, H Hausmaninger (9 (12), 0/9)

Vienna, AKH, Universitätsklinik für Innere Medizin I (onco), CIC 227, HT Greinix, P Kalhs (80 (84), 58/22)\*\*

Vienna-Lainz, Krankenhaus der Stadt Wien-Lainz, 5. Med Onko, K Geissler, E Ulsperger (0 (0), 0/0)

Vienna, St Anna Kinderspital (hem, onco), CIC 528, H Gadner, C Peters (32 (41), 21/11)

Vienna, Hanusch-Krankenhaus (hem, onco), CIC 743, E Pittermann, E Koller (17 (21), 0/17)

Vienna, Donauspital, CIC 767, W Hinterberger (10 (12), 0/10)

Vienna, Wilhelminenspital (hem, onco), CIC 828, H Ludwig (24 (37), 0/24)

**Azerbaijan:** no report

**Republic of Belarus** (three teams; 50 (52), 15/35)

Minsk, Belorussian Center (hem, onco, peds), CIC 591, O Aleinikova (25 (27), 4/21)

Minsk, Hospital No. 9, N Milanovitch (25 (25), 11/14)

Minsk, Institute of Haematology, V Ivanov\*

**Belgium** (24 teams; 510 (628), 190/320)

Aalst, OLV Ziekenhuis, E Wouters (inactive)

Antwerpen, Stuivenberg ZH, CIC 339, P Zachée (26 (42), 3/23)

Antwerpen-Edegem, University Antwerpen (hem), CIC 339:2, W Schroyens (16 (20), 3/13)

Antwerpen, AZ Middelheim, CIC 783, R de Bock (9 (10), 0/9)

Brugge, AZ St Jan (hem), CIC 506, D Selleslag, A Van Hoof, J Van Droogenbroeck, K Van Eygen (35 (46), 18/17)

Brussels, Institut Jules Bordet and the Children's University Hospital, CIC 215, D Bron, E Sariban, C Devalck, A Ferster (55 (66), 26/29)

Brussels, Clinique universitaire St Luc (hem, ads), CIC 234, A Ferrant (43 (46), 24/19)

Brussels, Clinique Universitaire St Luc (peds), CIC 234, C Vermeylen (19 (20), 11/8)

Brussels, Hôpital Erasme (hem), CIC 596, W Feremans, A Kentos, M Lambermont, A Deweiwere (20 (26), 0/20)

Brussels, University Hospital (hem, onco), CIC 630, B Van Camp, A Schots (34 (37), 14/20)

Brussels, The Clinic of Europe, CIC 779, C Dubois, C Laurent, S Marichal (0 (0), 0/0) not started yet.

Brussels, Cliniques Universitaires St Luc, (onco), M Symann (2 (3), 0/2)

Brussels, Institute Edith Cavalle Marie Depage (onco), C Vanhaelen (inactive)

Charleroi, Hopital Notre-Dame (hem, onco), CIC 349, M André (11 (14), 1/10)

Gent, University Hospital (hem, ads, peds), CIC 744, LA Noens (32 (33), 25/7)

Haine St Paul, Hôpital de Jolimont (hem), CIC 234, A Delannoy (11 (14), 0/11)

Hasselt, Virgajesse Ziekenhuis (hem), CIC 632, D Vanstraelen, Dr Janssen (18 (19), 0/18)

Jumet, Hôpital Civil de Jumet, A Duvivier\*

Leuven, University Hospital Gasthuisberg (hem, ads, peds), CIC 209, MA Boogaerts, P Vandenberghe, J Maertens (72 (86), 33/39)

Liège, CHR La Citadelle (hem, onco), CIC 353, B De Prijck (10 (12), 0/10)

Liège, University Hospital Sart-Tilman (hem), CIC 726, Y Béguin (47 (68), 22/25)

Liège, Centre Hospitalier St Joseph (hem), L Longree (inactive)

Roeselare, H Hartziekenhuis (hem, onco), CIC 646, F Van Aelst, J Tytgat, J Demol (13 (18), 4/9)

Yvoir, Clinique universitaire de Mont-Godinne (hem), CIC 234, C Doyen (37 (48), 6/31)

**Bosnia-Herzegovina:** no report

**Bulgaria** (one team; 10 (11), 1/9)

Sofia, University of Hospital 'Queen Johanna' (peds, hem-onco), CIC 346, D Bobev (10 (11), 1/9)

**Croatia** (two teams; 103 (109), 30/73)

Zagreb, Clinic Hospital 'Mercur', CIC 159, B Jaksic, H Minigo (31 (33), 5/26)

Zagreb, Clinical Hospital Center, CIC 302, B Labar, D Nemet, M Mrcic (72 (76), 25/47)

**Cyprus** (one team; 12 (12), 0/12)

Nicosia Makarios Hospital III (hem), CIC 575,  
N Papaminas (12 (12), 0/12)

**Czech Republic** (10 teams; 440 (531), 141/299)

Brno, Masaryk University Hospital (ads, peds, hem,  
onco), CIC 597, J Vorlicek, J Mayer, Z Koristek (71 (83),  
18/53)

Hradec Kralové, Charles University (hem), CIC 729,  
S Filip, M Blaha (52 (52), 18/34)

Olomouc, University Hospital (hem, onco), CIC 574,  
K Indrák (49 (59), 14/35)

Pilsen, Faculty Hospital (hem, onco), CIC 718, V Koza  
(67 (82), 30/37)

Prague, Clinical Haematology, Charles University,  
CIC 318, T Kozak (47 (59), 0/47)

Prague, Thomayer Memorial Hospital, CIC 375, J Abra-  
hamova, J Nepomucka (5 (6), 0/5)

Prague, University Hospital Motol (peds, hem), CIC 656,  
J Stary, E Kabickova (18 (20), 18/0)

Prague, University Hospital Motol (peds, onco),  
E Kabickova, CIC 656 (26 (39), 0/26)

Prague, Institute of Hematology and Blood Transfusion,  
CIC 656, A Vitek, P Kobyłka (51 (55), 43/8)

Prague, Charles University, CIC 745, M Trneny (54 (76),  
0/54)

**Denmark** (three teams; 180 (201), 58/122)

Aarhus, Amtssygehus (hem), CIC 634, E Segel (47 (51),  
0/47)

Copenhagen, Rigshospitalet (hem), CIC 206, N Jacobsen  
(114 (127), 58/56)

Copenhagen, Herlev Hospital (hem), University, CIC 568,  
HE Johnsen (19 (23), 0/19)

**Estonia** (one team; 17 (18), 3/14)

Tartu, University Hospital (hem, onco), CIC 746,  
H Everaus, A Kaare (17 (18), 3/14)

**Finland** (seven teams; 282 (302), 105/177)

Helsinki, Children's Hospital, CIC 219, U Pihkala,  
S Vettenranta (27 (30), 20/7)

Helsinki, University Hospital, Third Department of  
Medicine, CIC 515, T Ruutu (109 (110), 67/42)

Helsinki, University Hospital (onco), CIC 833, H Joensuu,  
R Janes (8 (8), 0/8)

Kuopio, Department of Medicine, University Hospital,  
CIC 369, E Jantunen, T Nousiainen (37 (38), 0/37)

Oulu, University Central Hospital (hem, onco), CIC 690,  
P Koistinen, T Turpeenniemi-Hujanen (28 (28), 0/28)

Tampere, University Hospital (ads, peds), CIC 635,  
E Koivunen, T Lehtinen, R Silvennoinen, M Arola  
(30 (38), 0/30)

Turku, University Central Hospital, CIC 225, K Remes  
(43 (50), 18/25)

**France** (80 teams; 2979 (3769), 758/2221)

Amiens, CHU d'Amiens, B Desablens (inactive)

Angers, Centre Hospitalier, CIC 650, N Ifrah, S François  
(62 (74), 22/40)

Angers, Paul Papin, Dr Gamelin\*

Argenteuil, Centre hospitalier, M Urbajtel (19 (22), 0/19)  
Besançon, Hôpital Jean Minjot and Hôpital St Jacques  
(ads, peds), CIC 233, P Hervé, J-Y Cahn, E Plouvier  
(70 (85), 28/42)

Bobigny, Hôpital Avicenne (hem), P Casassus\*

Bordeaux, CHU Hôpital de Bordeaux Enfants, Y Perel  
(inactive)

Brest, Centre Hospitalier, C Berthou (53 (69), 5/48)

Caen, Centre Hospitalier Régional, O Reman (18 (23), 0/18)

Caen, Hôpital Cote de Nacre (peds hem onco), P Boutard  
(3 (3), 0/3)

Caen, Centre Régional François Baclesse, AM Peny  
(25 (31), 0/25)

Clamart, Hôpital d'Instruction des Armées Percy, CIC 665,  
T de Revel, G Nedellec (26 (53), 3/23)

Clermont Ferrand, Centre Jean Perrin and CHU Hotel  
Dieu (ads, peds), CIC 273, J-O Bay, F Dèmeocq, P Travade  
(101 (140), 19/82)

Clichy, Hôpital Beaujon, J Brière\*

Colmar, Hôpital civil, B Audhuy (13 (14), 0/13)

Corbeil Essonne, Hôpital Gilles de Corbeil, A Devidas  
(8 (11), 0/8)

Créteil, Hôpital H Mondor (hem), CIC 252, C Cordonnier,  
M Kuentz (58 (62), 29/29)

Dijon, Hôpital d'Enfants, D Caillet (58 (76), 0/58)

Dunkerque, Centre Hospitalier (hem), M Wetterwald  
(10 (13), 0/10)

Grenoble, Centre Hospitalier A Michallon (ads, allo peds),  
CIC 270, JJ Sotto, F Garban, P Drillat (61 (87), 26/35)

Grenoble, Centre Hospitalier (auto peds), D Plantaz,  
M Bost (8 (8), 4/4)

Lille, Hôpital Claude Huriez, CIC 277, F Bauters, JP Jouet  
(93 (121), 37/56)

Lille, Hôpital Jeanne de Flandre, Dr Nelken (4 (4), 0/4)

Lille, Centre Oscar Lambret (onco), Dr Depadt,  
Dr Defachelles (17 (24), 0/17)

Lille, Centre Hospitalier Saint Vincent, N Cambier  
(7 (9), 0/7)

Limoges, Centre Hospitalier Dupuytren (ads., hem),  
CIC 977, D Bordessoule, P Turlure (38 (44), 0/38)

Lyon, Centre Léon Bérard, CIC 241, P Biron, T Philip  
(53 (69), 0/53)

Lyon, Hôpital Edouard Herriot, CIC 671, M Michallet,  
A Thiebaut, F Nicolini (56 (74), 34/22)

Lyon Sud (Pierre Benite), Centre Hospitalier, B Coiffier\*

Lyon, Hôpital Debrousse, N Philippe, C Galambrun,  
Y Bertrand (30 (32), 29/1)

Marseille, Inst. Paoli-Calmettes, CIC 230, D Blaise  
(235 (337), 22/213)

Marseille, Hôpital d'Enfants de la Timone (onco), CIC 301,  
C Coze, JL Bernard ((13 (20), 0/13)

Meaux, Centre Hospitalier de Meaux, C Soussain (14 (14),  
0/14)

Metz, Thionville Hôpital Notre-Dame de Bon-Secours  
(hem), V Dorvaux, B Christen\*

Montpellier, CHU de Montpellier Hôpital Arnaud de  
Villeneuve, F Bernard (4 (4), 1/3)

Montpellier, Centre Rég. De Lutte contre de Cancer,  
M Fabbro, J-B Dubois (14 (14), 0/14)

Montpellier, CHR Lapeyronie (hem), CIC 926, JF Rossi  
(91 (99), 14/77)

- Mulhouse, Hôpital du Hasenrain, M Ojeda, Ph Hénon (15 (16), 0/15)  
Nantes, Hotel Dieu (hem), CIC 253, JL Harousseau, N Milpied (143 (188), 38/105)  
Nice, Hôpital de l'Archet 1, CIC 523, JP Cassuto, N Gratecos (54 (78), 19/35)  
Nice, Fondation Lenval (peds), Dr Soler, Dr De Ricaud\*  
Nice, Centre Antoine Lacassagne, A Thyss (18 (28), 0/18)  
Paris, Hôpital Necker (ads, hem), CIC 160, B Varet, C Bélanger, A Veil (62 (64), 33/29)  
Paris, Hôpital Necker des enfants malades, CIC 201, A Fischer (35 (41), 33/2)  
Paris, Hôpital St Louis (hem allo, ads, peds), CIC 207 + CIC 748, E Gluckman, H Esperou, A Baruchel, M-F Auclerc (88 (91), 87/1)  
Paris, Hôpital St Louis (auto), CIC 805, G Gisselbrecht (54 (54), 0/54)  
Paris, Hôpital St Louis (auto-leuk), CIC 960, H Dombret, L Degos, P Rousselot\*  
Paris, Hôpital St Louis (auto immuno-Hem), J-C Brouet, B Anruf, J-P Femand (60 (62), 0/60)  
Paris, Hôpital St Antoine (hem), CIC 213, C Gorin, L Fouillard (38 (50), 5/33)  
Paris, Hôpital D'enfants Armand-Trousseau, CIC 213, G Leverger, A Auvrignon, L Douay (6 (7), 0/6)  
Paris, Hôtel Dieu (hem), CIC 222, J-P Marie, B Rio (47 (61), 14/33)  
Paris, Hôpital Pitié Salpêtière (hem), CIC 262, J-P Vernant, V Leblond, N Dhedin (94 (101), 43/51)  
Paris, Institut Curie (ads/onco/peds), CIC 702, J Michon\*  
Paris, Hôpital Tenon (onco), CIC 747, JP Lotz (27 (54), 0/27)  
Paris, Hôpital Robert Debré, P Rohrlich, E Vilmer (24 (24), 24/0)  
Paris, Hôpital Européen GP, JM Andrieu, C Le Maignan (15 (23), 0/15)  
Paris, Hotel Dieu (onco), Professor Bernadou, L Chauvenet (5 (5), 0/5)  
Paris, Hôpital Cochin, F Dreyfus, M Quarre (35 (38), 0/35)  
Pessac, Hôpital Haut-Lévêque, CIC 267, J Reiffers (108 (145), 35/73)  
Poitiers, Hôpital la Miletrie, CIC 264, M Renaud (71 (95), 13/58)  
Pontoise, Hospital René Dubois (onco), CIC 961, Y Kernéis, F Moruan (17 (23), 0/17)  
Reims, Hopital Robert Debré (hem, onco), CIC 959, B Pignon, C Himberlin (25 (32), 0/25)  
Rennes, Hôpital Pontchaillou, C Dauriac, T Lamy\*  
Rennes, CHRU, Clinique Médical Infantile, E Le Gall, V Gandemer (7 (8), 4/3)  
Rouen, Centre Henri Becquerel, H Tilly, P Lenain (74 (89), 11/63)  
Rouen, Hôpital Charles Nicolle, P Tron (15 (16), 11/4)  
St Cloud, Centre René Huguenin, CIC 551, M Janvier (6 (8), 0/6)  
St Etienne, Hôpital Etienne, D Guyotat, JL Stephan\*  
Strasbourg, Hôpital de Haute-pierre, B Lioure (92 (108), 19/73)  
Strasbourg, Hospices Civils, Service de Pédiatrie 5, P Lutz (13 (16), 5/8)  
Toulouse, Hôpital de Purpan (hem), CIC 624, M Attal, J-C Nogaro (128 (141), 27/101)  
Toulouse, Hôpital de Purpan (peds), CIC 624, H Rubie\*  
Toulouse, Centre Claudius Régaud, H Roche, C Chevreau (8 (18), 0/8)  
Tours, Hôpital Bretonneau (onco), CIC 272, P Colombat (69 (69), 0/69)  
Valenciennes, Hosp. De Valenciennes, M Simon\*  
Vandœuvre-les-Nancy, Hôpital d'Enfants, P Bordigoni (43 (46), 32/11)  
Vandœuvre-les-Nancy, CHU Nancy-Brabois (hem auto), P Lederlin, F Witz (57 (85), 0/57)  
Villejuif, Institut G Roussy (peds), CIC 503, O Hartmann, D Valteau-Couanet (53 (105), 0/53)  
Villejuif, Institut G Roussy (ads, hem), CIC 666, J-H Bourhis, C Boccaccio, J-M Vantelon (108 (141), 32/76)  
Villejuif, Hôpital Paul Brousse, B Delmas-Marsalet (3 (3), 0/3)
- Georgia:** no report
- Germany** (104 teams; 3617 (4684), 1416/2201)  
Aachen, Universitätsklinikum RWTH (hem, onco), Med Klinik IV, CIC 348, R Osieka, G Gehbauer (9 (12), 0/9)  
Augsburg, Zentralklinikum (hem, onco), Med Klinik II, G Schlimok, M Sandherr (28 (36), 5/23)  
Bad Saarow, Humaine Klinikum, G Schultze, H Fuss (21 (21), 1/20)  
Berlin, Charité Virchow Klinikum d HU Campus Charité Mitte (hem, onco), CIC 293, W Siegert, K Possinger, O Rick (18 (18), 0/18)  
Berlin, Charité Campus Virchow Klinikum (hem, onco), CIC 807, B Dörken, R Arnold (90 (102), 53/37)  
Berlin, Charité Virchow Klinikum der HU (peds), CIC 336, W Ebell, G Gaedicke (30 (36), 25/5)  
Berlin, HELIOS Klinikum Berlin, Robert- Rössle Klinik (hem, onco), CIC 518, B Dörken, L Wolf (24 (24), 0/24)  
Berlin, Universitäts-Klinik der FU Benjamin Franklin (hem, onco), CIC 590, W Knauf, E Thiel (47 (63), 14/33)  
Berlin, Krankenhaus Neukölln (hem, onco), AC Mayr, C Kerschgens (0 (0), 0/0)  
Bielefeld, Krankenanstalten Gilead (hem, onco), U Kruempelmann, R Kolloch (6 (7), 0/6)  
Bielefeld, Franziska Hospital (hem, onco), HJ Weh, A Zumsprekel (7 (8), 0/7)  
Bochum, Knappschaftskrankenhaus (onco), U Graeven, W Schmiegel (14 (22), 0/14)  
Bonn, Medizinische Klinik und Poliklinik 1, T Sauerbruch, I Schmidt-Wolf, A Glasmacher (32 (68), 0/32)  
Bonn, Universitäts Kinderklinik (hem, onco), U Bode, C Hasan (8 (8), 0/8)  
Braunschweig, Städtisches Klinikum (hem, onco), CIC 674, B Wörmann, J Haessner (21 (26), 0/21)  
Bremen, Zentralkrankenhaus St Jürgen, CIC 602, CR Meier, H Rasche (23 (26), 0/23)  
Bremen, DIAKO, T Wolff, KH Pflüger (17 (32), 0/17)  
Chemnitz, KH Küchwald, F Fiedler, G Geissler (28 (32), 0/28)  
Cottbus, Carl-Thiem Klinikum, Med Klinik II, H Steinhauer, N Peter (21 (31), 0/21)

- Dessau, Städtisches Klinikum Dessau (hem, onco), A Florschütz, M Plauth (inactive)
- Dortmund, St Johannes Hospital (hem, onco), H Plelken, M Nahler (1 (2), 0/1)
- Dresden, Universitätsklinikum Carl Gustav Carus (hem, onco), CIC 808, G Ehninger, M Bornhäuser (138 (163), 87/51)
- Duisburg, St Johannes Hospital, CIC 519, C Aul, J Anhuf (27 (35), 0/27)
- Düsseldorf, Heinrich-Heine Universität; Medizinische Klinik (hem, onco), CIC 390, R Haas, G Kobbe (81 (104), 30/51)
- Düsseldorf, Heinrich-Heine Universität; Zentrum für Kinderheilkunde, CIC 651, U Göbel, D Dilloo (21 (56), 12/9)
- Erlangen, Universität Erlangen-Nuremberg (hem, onco), Med Klinikum III, CIC 809, M Gramatzki, J-R Kalden (25 (31), 6/19)
- Erlangen, Universitäts-Klinik für Kinder und Jugendliche, CIC 809, W Rascher, W Holter, J Beck, D Stachel (16 (18), 12/4)
- Essen, Universitäts-Klinik (ads, peds), CIC 259, UW Schaefer, DW Beelen, B Kremens V Runde, W Havers, O Basu (163 (170), 150/13)
- Essen, Evangelisches Krankenhaus Essen-Werden GmbH, CIC 784, W Heit, M Wattad (50 (52), 0/50)
- Essen, Universitäts-Klinik (hem), U Dührsen, R Noppeney (9 (11), 0/9)
- Essen, West German Cancer Center, S Seeber, P Bojko (49 (108), 0/49)
- Frankfurt a.M., Universitätsklinikum dJW Goethe (hem, onco peds), CIC 138, T Klingebiel, D Schwabe (19 (21), 12/7)
- Frankfurt a.M., JW Goethe-Universität (ads), CIC 297, D Hoelzer, H Martin (64 (74), 31/33)
- Frankfurt, KH Nordwest, A Knuth, E Jäger (1 (1), 0/1)
- Freiburg i.Br., Universitätsklinik (ads, hem, onco), Med Klinik I, CIC 810, J Finke, R Mertelsmann (120 (140), 59/61)
- Freiburg i.Br., Universitäts-Kinderklinik (hem, onco), CIC 810, C Niemeyer, U Kontny, U Duffner (22 (22), 19/3)
- Giessen, Universitätskinderklinik (hem, onco), CIC 326, A Reiter, W Wössmann (14 (16), 10/4)
- Göttingen, Georg-August Universität (hem, onco), CIC 552, B Glass, L Trümper (52 (64), 19/33)
- Greifswald, Ernst-Moritz-Arndt Universität (ads + peds), CIC 530, G Dölken, W Krüger (37 (47), 13/24)
- Gütersloh, Städtkrankenhaus (hem, onco), R Depenbusch, C Gropp (2 (3), 0/2)
- Hagen, Kath. Krankenhaus (hem, onco), CIC 536, H Eimermacher, W Rethwisch (13 (24), 0/13)
- Halle, Martin Luther Universität (hem, onco, ads), CIC 338, H-J Schmoll, H Wolf (27 (55), 4/23)
- Halle, Martin Luther Universität (hem, onco, peds), CIC 654, S Burdach, A Wawer (13 (24), 4/9)
- Hamburg, KH St George (hem, onco), CIC 153, P Dreger, N Schmitz, B Seyfarth (39 (48), 0/39)
- Hamburg, Allgemeines Krankenhaus Altona (hem, onco), CIC 366, D Braumann, H Salwender (32 (41), 0/32)
- Hamburg, Eppendorf-Krankenhaus (hem, onco, ads, peds) CIC 614, AR Zander (122 (128), 104/18)
- Hamburg, Eppendorf-Krankenhaus (hem, onco, ads), Med Klin II, CIC 673, D Hossfeld (24 (26), 0/24)
- Hameln, Kreiskrankenhaus Hameln (hem, onco), H Schmidt (7 (9), 0/7)
- Hamm, St Marien Hospital (hem, onco), H Dürk, B Schmid (12 (17), 0/12)
- Hannover, Medizinische Hochschule (hem, onco, ads), CIC 295, A Ganser, B Hertenstein (83 (109), 50/33)
- Hannover, Medizinische Hochschule (hem, onco, peds), CIC 295, K Welte, K Sykora (18 (23), 16/2)
- Hannover, KH Siloah, CIC 342, H Kirchner, M Sosada (11 (12), 0/11)
- Heidelberg, Ruprecht-Karls Universitäts-Poliklinik (hem, onco), CIC 524, AD Ho, H Schäfer (154 (223), 24/130)
- Homburg/Saar, Universität des Saarlandes (hem, onco), CIC 785, J Schubert, M Pfreundschuh (58 (74), 14/44)
- Idar-Oberstein, Klinik für Hämato-/Onkologie, CIC 592, AA Fauser, M Kiehl, N Basara (48 (60), 41/7)
- Jena, Klinik der FSU (hem, onco), Innere Medizin II, CIC 533, HG Sayer, K Hoeffken (47 (60), 22/25)
- Jena, Klinikum der FSU (hem, onco), Universitäts-Kinderklinik, CIC 750, F Zintl, D Fuchs (19 (20), 15/4)
- Kaiserslautern, Westpfalz-Klinikum (hem), CIC 357, F-G Hagmann, H Link (9 (18), 0/9)
- Karlsruhe, Städtisches Klinikum (hem, onco), CIC 290, J Fischer, T Kubin (10 (20), 0/10)
- Kassel, Städtische Kliniken (hem, onco), E Steinhauer, M Wolf (3 (5), 0/3)
- Kiel, Christian-Albrechts-Universität (hem, onco), CIC 256, M Kneba (51 (61), 12/39)
- Köln, Universitäts-Klinik (ads, peds), CIC 534, V Diehl, Ch Scheid, F Berthold, T Simon (60 (75), 12/48)
- Krefeld, Klinikum Krefeld, Med Klinik III, S Helmer, T Frieling (3 (4), 0/3)
- Leipzig, Universitäts-Klinik (hem, onco), CIC 389, D Niederwieser, R Krahl, W Pönisch (107 (117), 68/39)
- Lemgo, Klinikum Lippe, HP Lohrmann (7 (8), 0/7)
- Lübeck, Med Universität (ads, peds), CIC 367, J Fem, T Wagner, S Peters, P Bucsky, Ch Schultz (20 (22), 0/20)
- Lübeck, Städtisches KH Sud (hem, onco), Dr Heer-Sonderhoff, S Fetscher (12 (12), 0/12)
- Magdeburg, Otto-von-Guericke Universität (hem, onco), CIC 359, A Franke, M Koenigsmann (19 (28), 0/19)
- Magdeburg, Städt. Klinikum Magdeburg (hem, onco), E Kettner, B Bilsing (2 (2), 0/2)
- Mainz, Johannes-Gutenberg-Universität (hem), Med. Klin. III, CIC 786, C Huber, K Kolbe (69 (76), 32/37)
- Mannheim, III Med. Klinik, R Hehlmann, J Hastka (8 (9), 0/8)
- Marburg, Med. Universitätsklinik der Philipps Universität (hem, onco), CIC 645, A Neubauer, J Beyer (53 (72), 23/30)
- Minden/Westfalen, Med. Klinik (hem, onco), H Bodenstein, HJ Tischler (14 (16), 0/14)
- Mönchengladbach, KH Maria Hilf II, D Kohl, H-E Reis (9 (11), 0/9)
- Munich, Klinikum Grosshadern der LMU (ads, hem, onco) CIC 513, H-J Kolb, W Hiddemann (119 (141), 75/44)
- Munich, Klinikum Innenstadt der LMU (peds, hem, onco), CIC 513, C Bender-Götze (19 (20), 11/8)
- Munich, SKH München-Harlaching, CIC 664, R Hartenstein, R Munker (13 (20), 0/13)

- Munich, Städt Krankenhaus Schwabing (hem, onco, peds), P Emmerich, L Stengel-Rutkowski (3 (3), 2/1)
- Munich, Klinikum Innenstadt der LMU, C Straka, D Schlöndorff (30 (49), 0/30)
- Munich, SKH München-Schwabing (hem, onco), Ch Nerl, N Fischer, C Waterhaus (17 (28), 0/17)
- Munich, Klinikum rechts der Isar (hem, onco), CIC 558, C Peschel, Cv Schilling (37 (53), 4/33)
- Münster, Westfälische Wilhelms-Universitäts Kinderklinik (hem, onco), CIC 505, H Jürgens, M Paulussen, J Vormoor (27 (29), 14/13)
- Münster, Westfälische Wilhelms-Universitäts Klinik (hem, onco), Innere Med., CIC 680, W Berdel, J Kienast (88 (109), 34/54)
- Neuss, Lukaskrankenhaus (hem, onco), P Czygan, J Streuss (0 (0), 0/0)
- Nürnberg, Städt Klinikum (hem, onco), CIC 625, H Wandt, W Gallmeier, K Schäfer (56 (65), 20/36)
- Oldenburg, Klinikum Oldenburg (hem, onco), CIC 749, B Metzner, H Illiger (54 (89), 0/54)
- Potsdam, Klinikum Ernst von Bergmann (hem, onco), A Haas, R Pasold (16 (22), 0/16)
- Regensburg, Universitäts Klinikum (hem, onco), CIC 787, E Holler, R Andreesen, A Reichle (96 (131), 42/54)
- Rostock, Universitäts Klinikum (hem, onco), CIC 585, M Mathias, M Freund, J Casper (45 (62), 23/22)
- Siegen, St Marien Krankenhaus (hem, onco), CIC 135, T Gaska, W Gassmann (11 (17), 0/11)
- Stuttgart, Robert-Bosch-Krankenhaus (hem, onco), CIC 145, S Martin, W Aulitzky (29 (39), 0/29)
- Stuttgart, Olgahospital (hem, onco), Pädiatrisches Zentrum, CIC 701, J Treuner, E Koscielniak (4 (5), 0/4)
- Stuttgart, Bürgerhospital, W Grimminger, H Mergenthaler (11 (14), 0/11)
- Stuttgart, Diakonissen Krankenhaus, E Heidemann, J Kaesberger (8 (15), 0/8)
- Stuttgart, Katharinenhospital (onco), J Schleicher, H-G Mergenthaler (9 (18), 0/9)
- Tübingen, Medizinische Universitäts-Klinik (hem, onco), CIC 223, L Kanz, H Einsele, C Faul (100 (162), 39/61)
- Tübingen, Medizinische Universitäts-Klinik (hem, onco), Abteilung Pädiatrie, CIC 535, J Greil, D Niethammer (31 (34), 20/11)
- Ulm, Medizinische Universitäts-Klinik (hem, onco), CIC 204, H Döhner, D Bunjes (106 (141), 46/60)
- Ulm, Kinderklinik der Universität, CIC 204, W Friedrich, K Debatin, A Schultz (31 (36), 30/1)
- Wiesbaden, Deutsche Klinik für Diagnostik, CIC 311, R Schwerdtfeger, M Schleining, H Baurmann (64 (73), 57/7)
- Wiesbaden, Dr Horst-Schmidt Klinikum (hem, onco), CIC 586, N Frickhofen, B Jung (17 (36), 0/17)
- Wuppertal, Klinikum Wuppertal GmbH (hem, onco), A Raghavachar (3 (3), 0/3)
- Würzburg, Universitätsklinikum Würzburg (hem, onco, ads), CIC 712, K Wilms, F Weissinger (27 (41), 0/27)
- Würzburg, Universitätsklinikum Würzburg (peds), P Schlegel, P Speer (8 (10), 0/8)
- Greece** (11 teams; 198 (228), 78/120)
- Alexandroupolis, Thrace University Medical School (Haem), CIC 681, G Bourikas, D Pantelidou (3 (3), 0/3)
- Athens, Laikon General Hospital, CIC 328, Y Rombos, D Boutsis, V Kalotychoy (14 (14), 0/14)
- Athens, Medical Center (hem), CIC 603, A Pigadito (4 (5), 0/4)
- Athens, University of Athens, CIC 604, I Dervenoulas\*
- Athens, Evangelismos Hospital (hem), CIC 622, D Karakassis, A Skandalis, N Harhalakis, E Nikiforakis (38 (50), 20/18)
- Athens, Diagnosis and Therapy Centre 'Hygeia' (hem), Maroussi, CIC 643, G Karianakis (15 (15), 5/10)
- Athens, Hellenic Cancer Institute St Savas (onco), CIC 751, A Efremedis, M Stamatellou, K Papanastassiou, M Pouli (29 (38), 2/27)
- Athens, 'Aghia Sophia' Children's Hospital, CIC 752, S Graphakos (29 (30), 17/12)
- Crete, University Hospital of Heraklion (peds, hem-onco), CIC 352, M Kalmanti (0 (0), 0/0) not started yet
- Patras, University Medical School (hem), CIC 281, NC Zoumbos, M Tiniakou (9 (10), 4/5)
- Thessaloniki, The George Papanicolaou General Hospital (hem), CIC 561, AS Fassas (57 (63), 30/27)
- Hungary** (four teams; 158 (165), 40/118)
- Budapest, National Medical Centre (hem), CIC 504, A Poros, A Barta, E Torbagyi (38 (41), 11/27)
- Budapest, Szent Laszlo Hospital, CIC 739, T Masszi, P Reményi, G Kriván (77 (81), 23/54)
- Miskolc, Postgraduate Medical School (peds), CIC 599, N Kalman, G Marton (17 (17), 6/11)
- Pécs, University of Pécs, Internal Medicine, CIC 682, H Losonczy, M Dávid, Á Szomor (26 (26), 0/26)
- Iceland** (one team; 0 (0), 0/0)
- Reykjavik, National University Hospital (hem), CIC 605, S Reykdal (0 (0), 0/0) starting 2003
- Iran** (two teams; 169 (170), 130/39)
- Shiraz, Nemazee Hospital (hem, onco), CIC 188, M Ramzi (27 (28), 27/0)
- Teheran, Shariati Hospital (hem, onco), CIC 633, A Ghavamzadeh (142 (142), 103/39)
- Ireland** (seven teams; 120 (128), 61/59)
- Cork, University Hospital, P Cotter\*
- Dublin, St James's Hospital (hem), CIC 257, SR McCann (75 (81), 45/30)
- Dublin, St Vincent's Hospital (hem, onco), CIC 541, J Crown, K Murphy (10 (12), 0/10)
- Dublin, Our Lady's Hospital of Sick Children, Crumlin, CIC 774, A O'Meara (28 (28), 16/12)
- Dublin, Mater Hospital (hem), B Otridge (7 (7), 0/7)
- Galway, University College Hospital, M Murray\*
- Limerick, Regional Hospital, M Cahill (0 (0), 0/0)
- Israel** (six teams; 401 (467), 185/216)
- Haifa, Rambam Medical Center (hem, ads, peds), CIC 345, J Rowe (110 (131), 43/67)
- Jerusalem, Hadassah University Hospital (ads, peds), CIC 258, R Or, S Slavin (114 (133), 73/41)
- Petach-Tikva, Children's Medical Center, CIC 755, J Stein (33 (38), 21/12)

Revohot, Kaplan Hospital (hem), CIC 327, A Berribi (12 (13), 0/12)

Tel Aviv, Sourasky Medical Center, CIC 161, E Naparstek (14 (19), 7/7)

Tel Hashomer, Chaim Sheba Medical Center (hem ads, peds) CIC 754 + CIC 572, A Nagler, A Shimoni, A Toren, H Golan, B Bielorai (118 (133), 41/77)

**Italy** (97 teams; 3351 (4275), 998/2353)

Alessandria, SS Antonio e Biagio e C Arrigo (hem), CIC 825, A Levis, A Allione, M Pini, F Salvi (20 (28), 4/16)

Ancona, Nuovo Ospedale Torrette (hem), CIC 788, P Leoni, A Olivieri (48 (61), 10/38)

Avellino, AOS Giovanni Di Guglieimo (hem), CIC 789, E Volpe, N Cantore (24 (26), 2/22)

Avezzano, Ospedale Civile di Avezzano, F Recchia (3 (3), 0/3)

Aviano, CRO Aviano (onco), CIC 162, M Michieli, M Rupolo, M Mazzucato, F Lollo (21 (24), 0/21)

Bari, Università degli Studi di Bari (hem), CIC 649, V Pavone, V Liso (26 (26), 5/21)

Bergamo, Ospedale Riuniti, CIC 658, T Barbui, A Rambaldi (85 (108), 18/67)

Bologna, St Orsola-Malpighi (hem, onco), CIC 240, G Bandini, F Bonifazi, M Baccarani (141 (163), 41/100)

Bologna, St Orsola-Malpighi, Oncologia Medica, CIC 657, A Martoni, C Zamagni (10 (15), 0/10)

Bologna, Poli. S Orsola, Clinica pediatrica III, CIC 790, A Pession (19 (23), 9/10)

Bolzano, Ospedale S Maurizio (hem), CIC 299, M Casini, P Fabris, P Coser (32 (63), 3/29)

Brescia, Ospedali Civili, CIC 288, T Izzi, G Rossi, C Almici (39 (66), 0/39)

Brescia, Università degli Studi di Brescia (peds), CIC 741, F Porta, A Ugazio (18 (24), 15/3)

Brindisi, Ospedaliera 'A Di Summa', Perrino Hospital (hem), CIC 920, G Quarta, S Pinna (11 (11), 0/11)

Cagliari, Ospedale A Businco (hem), CIC 791, P Dessalvi (31 (37), 11/20)

Cagliari, BMT Center, CIC 811, G La Nasa, L Contu, (14 (17), 8/6)

Cagliari, Ospedale per le Microcitemie (peds), CIC 812, F Argioli, A Cao (11 (11), 10/1)

Catania, Ospedale Ferrarotto (hem), CIC 792, R Giustolisi, G Milone (56 (58), 17/39)

Cremona, Ospedale Maggiore (hem), Medicina II, CIC 226, S Morandi, C Bergonzi (8 (13), 0/8)

Cuneo, Hospital S Croce E Carle (hem), CIC 606, A Gallamini, M Grasso (24 (31), 4/20)

Ferrara, St Anna Hospital (hem), CIC 330, G Castoldi, F Lanza, S Moretti, GM Rigolin, R Spanedda (20 (20), 0/20)

Firenze, Ospedale di Careggi (hem), CIC 304, A Bosi (73 (78), 19/54)

Firenze, Azienda Ospedale, 'A Meyer', CIC 600, L Faulkner (9 (9), 3/6)

Forli, Morgagni-Pierantoni Hospital (onco), CIC 298, GL Frassinetti, D Amadori (5 (9), 0/5)

Genova, Università, CIC 139, F Patrone, A Ballestrero (44 (59), 0/44)

Genova, Ospedale S Martino (hem), CIC 217, A Bacigalupo, G Santini (121 (142), 89/32)

Genova, Istituto Giannina Gaslini, CIC 274, G Dini (29 (49), 10/19)

Genova, Ist Nat. per la Ricerca s. Cancro (onco), CIC 340, M Venturini, R Rosso (0, 0/0)

Latina, Ospedale S Maria Goretti, A De Blasio, E Zappone (13 (17), 0/13)

Lodi, Ospedale Maggiore Lodi, G Nalli, V Fregoni (inactive)

Messina, Policlinico Universitario (onco), CIC 669, V Pitini (11 (12), 0/11)

Milano, Ospedale di Niguarda (onco ST), CIC 184, S Siena, P Pedrazzoli, R Schiavo (47 (55), 6/41)

Milano, Ospedale Maggiore di Milano, CIC 265, G Lambertenghi Delilieri (38 (50), 22/16)

Milano, Ospedale Fatebenefratelli e Oftalmico (onco), CIC 269, A Scanni, C Bianchi, D Pedretti (2 (2), 0/2)

Milano, Ospedale di Niguarda (hem), CIC 294, P Marengo, R Cairoli (58 (65), 13/45)

Milano, Istituto Europeo di Oncologia, CIC 331, G Martinelli (70 (149), 1/69)

Milano, Ist Clinico Humanitas (hem-onco), CIC 354, A Santoro, L Castagna (84 (134), 8/76)

Milano, Ist Nazionale Tumori di Milano (onco, peds), CIC 616, R Luksch (31 (59) 0/31)

Milano, Istituto Nazionale Tumori, CIC 616, A Gianni (81 (147), 18/63)

Milano, S Carlo Borromeo Hospital (onco), CIC 683, L Tedeschi (2 (2), 0/2)

Milano, Istituto Scientifico HS Raffaele, CIC 813, M Bregni (59 (107), 21/38)

Modena, University of Modena (hem, onco), CIC 543, F Narni, A Donelli, R Sabbatini (27 (48), 7/20)

Monza, Ospedale S Gerardo (peds), CIC 279, C Uderzo (24 (26), 18/6)

Monza, Ospedale S Gerardo de' Tintori, CIC 544, P Pioltelli, E Pogliani (45 (59), 13/32)

Napoli, Div. Di Oncologia, CIC 313, C Battista, G Pacilio, B Chiurazzi, G Iodice (8 (8), 1/7)

Napoli, Hospital 'Pausilipon' (hem peds), V Poggi, M Ripaldi (11 (12), 4/7)

Napoli, Cardarelli Hospital (hem), CIC 607, F Ferrara (46 (46), 0/46)

Napoli, Università Federico II (hem), CIC 766, B Rotoli, C Selleri, G De Rosa (41 (43), 14/27)

Noale, Civic Hospital (onco), CIC 563, O Vinante, G Azzarello (12 (14), 5/7)

Nuoro, Ospedale San Francesco (hem), CIC 793, A Gabbas, A Palmas (11 (17), 0/11)

Orbassano, Ospedale San Luigi Orbassano, CIC 378, G Saglio, A Guerrasio (37 (43), 2/35)

Padova, Centro Leucemie Infantili, CIC 285, C Messina, S Cesaro, L Zanesco, S Varotto (27 (38), 12/15)

Padova, Centro Oncologia Regionale, CIC 319, S Aversa, S Monfardini (10 (15), 0/10)

Palermo, Ospedale V Cervello (hem), CIC 392, R Scimè, A Cavallaro (56 (68), 24/32)

Palermo, Ospedale 'La Maddalena' (hem, onco), CIC 692, M Musso, F Porretto, A Crescinanno (45 (72), 9/36)

Palermo, Uni degli studi di Palermo (hem), CIC 814, G Mariani (8 (10), 0/8)

Parma, Cattedra di Ematologia, Univ. of Parma, CIC 245, V Rizzoli (10 (18), 1/9)

Parma, Azienda Ospedaliera Di Parma, (onco), CIC 364, V Franciosi, S Cascinu, G Vasini (9 (18), 1/8)  
 Pavia, Policlinico S Matteo (hem), CIC 286, EP Alessandrino (63 (78), 19/44)  
 Pavia, Policlinico St Matteo (hem, onco, peds), CIC 557, F Locatelli (84 (95), 72/12)  
 Pavia, Policlinico St Matteo (onco), CIC 562, E Ascari, M Danova (20 (23), 0/20)  
 Pavia, Fondazione S Maugeri (onco), CIC 771, A Zambelli, G Robustelli della Cuna (14 (14), 1/13)  
 Perugia, Policlinico Monteluca (onco), CIC 573, AM Liberati, FGrignani (13 (16), 0/13)  
 Perugia, Policlinico Monteluca (hem), Università, CIC 794, MF Martelli, F Aversa, A Tabilio (103 (114), 36/67)  
 Perugia, Silvestrini Hospital, A Amici (0 (0), 0/0) starting 2003  
 Pesaro, Ospedale San Salvatore, CIC 529, G Visani, G Lucarelli (49 (49), 38/11)  
 Pescara, Ospedale Civile (hem), CIC 248, P di Bartolomeo (41 (41), 26/15)  
 Piacenza, Ospedale Civile (hem, onco), CIC 163, L Cavanna (12 (15), 1/11)  
 Pisa, St Chirara Hospital (ads, onco) CIC 320, C Bengala (15 (15), 0/15)  
 Pisa, University of Pisa (Ads hem, peds hem + onco), CIC 795, P Macchia, M Petrini (54 (62), 17/37)  
 Ravenna, Ospedale Civile (hem, onco), CIC 306, G Rosti (35 (53), 0/35)  
 Reggio di Calabria, Azienda Ospedale 'Riuniti e Morelli', CIC 587, P Iacopino (76 (100), 33/43)  
 Reggio Emilia, Arcispedale S Maria Nuova (hem), CIC 660, L Gugliotta (24 (31) 6/16)\*\*  
 Rimini, Ospedale Infermi Rimini (hem, onco), P Fattori (7 (8), 0/7)\*\*  
 Rionero in Vulture, Ospedale Oncologico Regionale, CIC 185, N Di Renzo (10 (11), 0/10)  
 Roma, Università 'La Sapienza', CIC 232, W Arcese, F Mandelli, G Meloni (103 (107), 39/64)  
 Roma, Ospedale S Camillo (hem), CIC 287, I Majolino, A Locasciulli (62 (70), 18/44)  
 Roma, Università Cattolica (hem), CIC 307, S Cuore, S Sica, G Leone (49 (57), 12/37)  
 Roma, Ospedale Bambino Gesù (hem), CIC 315, G De Rossi (10 (10), 7/3)  
 Roma, Università S Eugenio (hem), CIC 756, S Amadori, L Cudillo (40 (44), 16/24)  
 Roma, Ospedale Bambino Gesù (onco), CIC 796, A Donfrancesco (13 (19), 0/13)  
 San Giovanni Rotondo, Hospital Casa Sollievo Sofferenza (onco), CIC 314, M Aieta (1 (1), 0/1)  
 San Giovanni Rotondo, Hospital Casa Sollievo Sofferenza (peds), CIC 350, P Paolucci, M Pastore (5 (5), 0/5)  
 San Giovanni Rotondo, Hospital Casa Sollievo Sofferenza (hem), CIC 526, AM Carella, G Beltrami, AM Carella (Jr), M Greco (63 (84), 23/40)  
 Siena, Ospedale Sclavo (hem), CIC 321, F Lauria (28 (31), 5/23)  
 Taranto, Ospedale Nord (hem), CIC 332, P Mazza, G Palazzo, B Amurri (79 (85), 14/65)

Taranto, Ospedale SS Annunziata, Dr Pezzella (inactive)  
 Torino, S Giovanni Antica Sede Hospital, CIC 322, M Airoidi\*  
 Torino, Azienda Ospedaliera S Giovanni, CIC 231, M Falda, F Locatelli (76 (88), 28/48)  
 Torino, Ospedale Regina Margherita (peds), CIC 305, E Madon, F Fagioli (48 (49), 20/28)  
 Torino, Ospedale Mauriziano Umberto 1, IRCC, CIC 377, M Aglietta, A Capaldi; F Carnevale (28 (33), 11/17)  
 Torino, Ospedale S Giovanni (hem), CIC 696, M Boccadoro, M Massaia, C Tarella, B Benedetto, D Caracciolo, A Pileri (68 (110), 10/58)  
 Trieste, Istituto per l'Infanzia, Clinical Pediatrica, CIC 525, M Andolina (12 (13), 12/0)  
 Udine, Policlinico Universitario (hem), CIC 705, R Fanin (88 (114), 34/54)  
 Venezia, Ospedale Civile Riuniti di Venezia (hem), CIC 502, T Chisesi, M Vespignani, M Chinello (15 (23), 0/15)  
 Verbania Pallanza, Ospedale di Verbania, M Bersi (2 (2), 0/2)  
 Verona, Policlinico di Borgo Roma (hem, onco), CIC 623 + CIC 514, G Perona, F Benedetti, G Cetto (48 (56), 13/35)  
 Vicenza, Ospedale S Bortolo (hem), CIC 797, R Raimondi, F Rodeghiero (35 (37), 9/26)

**Latvia:** no report

**Liechtenstein:** no report

**Lithuania:** (one team; 23 (25), 8/15)

Vilnius, University Hospital Santariskiu Klinikos (hem), I Trociukas (23 (25), 8/15)

**Luxemburg** (two teams)\*

Centre Hospitalier, M Dicato\*

Esch-Alrette, Hopital de la Ville Esch/Alzette, CIC 545, F Le Moine\*

**Macedonia:** (one team; 21 (22), 8/13)

Skopje, Medical Faculty (hem), CIC 381, B Georgievski (21 (22), 8/13)

**Malta:** no report

**Moldova:** no report

**Monaco:** no report

**Netherlands** (14 teams;) 626 (681), 235/391)

Amsterdam, Academic Medical Center (ads, peds), CIC 247, J van der Lelie, H van den Berg (peds) (38 (42), 10/28)

Amsterdam, Free University Hospital (onco), E van der Wall (inactive)

Amsterdam, Free University Hospital (hem), CIC 588, GJ Ossenkoppele (70 (80), 12/58)

Amsterdam, The Netherlands Cancer Institute, S Rodenhuis J Baars (23 (35), 0/23)

Enschede, The Medisch Spectrum Twente, CIC 360, Dr Schaafsma (18 (18), 0/18)

Groningen, University Hospital (hem), CIC 546, E Vellenga (45 (45), 0/45)

The Hague, Leyenburg Hospital, CIC 547, PW Wijermans (20 (24), 0/20)

Leiden, University Medical Centre (ads, peds), CIC 203, R Willemze, M Egeler (87 (93), 56/31)  
Maastricht, University Hospital (hem, onco), CIC 565, HC Schouten, J Wagstaff (39 (40), 15/24)  
Nieuwegein, St Antonius Hospital, CIC 200, D Biesma, G Veth, O de Weerd (10 (10), 0/10)  
Nijmegen, University Hospital (ads, peds, onco), CIC 237, A Schattenberg, L Beex, P Hoogerbrugge (90 (90), 53/37)  
Rotterdam, Dr Daniel den Hoed Cancer Center, CIC 246, JJ Cornelissen (74 (75), 23/51)  
Utrecht, University Hospital (hem, ads, peds), CIC 239, LF Verdonck, NM Wulfraat, (101 (118), 66/35)  
Zwolle, Isala Kliniecken/Sophia Ziekenhuis, CIC 548, M von Marwijk Kooy (11 (11), 0/11)

**Norway** (five teams; 144 (145), 39/105)  
Bergen, Haukelands Sjukhus, P Ernst (9 (9), 0/9)  
Oslo, Rikshospitalet, CIC 235, D Albrechtsen, L Brinch (66 (67), 39/27)  
Oslo, The Norwegian Radium Hospital (onco), CIC 782, S Kvaloy (29 (29), 0/29)  
Oslo, Ullevals Sjukhus (haem), F Wisslöf, J-M Tangen (18 (18), 0/18)  
Trondheim, St Olavs Hospital, J Hammerstrom, A Waage (22 (22), 0/22)

**Poland** (15 teams; 627 (697), 227/400)  
Gdansk, Medical University (hem), CIC 799, A Hellmann (51 (52), 22/29)  
Katowice, Silesian Medical Academy (hem), CIC 677, J Holowiecki (127 (148), 50/77)  
Krakow, Jagiellonian University C MUJ (hem), CIC 553, A Skotnicki (42 (44), 7/35)  
Lodz, Medical University of Lodz (hem), CIC 171, T Robak (19 (19), 0/19)  
Lublin, Children's University Hospital (hem, onco), CIC 678, J Kowalczyk (26 (27), 14/12)  
Lublin, University Medical School (hem, onco), CIC 695, A Dmoszynska, M Wach, A Walter-Croneck, W Legiec (35 (36), 0/35)  
Poznan, Institute of Pediatrics, CIC 641, J Wachowiak (21 (22), 19/2)  
Poznan, K Marcinkowski University (hem), CIC 730, M Komarnicki (59 (65), 22/37)  
Warsaw, Institute of Haematology and Blood Transfusion, CIC 693, B Marianska, L Konopka, B Nasilowska (14 (14), 2/12)  
Warsaw, Maria Skłodowska-Curie, Centre of Oncology, CIC 800, J Walewski (37 (40), 0/37)  
Warsaw, Central Hospital Military Medical Academy (hem, onco), CIC 816, P Rzepecki, K Sulek, C Szczylik (29 (36), 8/21)  
Warsaw, Central Clinical Hospital (hem, onco), CIC 954, W Wiktor-Jedrzejczak, A Deptala, M Rokicka (45 (63), 18/27)  
Wroclaw, K Diuske Hospital, CIC 538, A Lange (52 (54), 26/26)  
Wroclaw, Medical Academy (hem), CIC 699, K Kuliczkowski (7 (7), 0/7)  
Wroclaw, University of Medicine (peds, hem, onco), CIC 817, A Chybicka (63 (70), 39/24)

**Portugal** (six teams; 220 (260), 83/137)  
Coimbra, University Hospital, CIC 164, N Costa (19 (19), 0/19)  
Lisbon, Instituto Portugues de Oncologia, CIC 300, M Abecasis, F Leal Costa (56 (61), 24/32)  
Lisbon, Hospital de Santa Maria, CIC 636, J Alves do Carmo, F de Lacerda (39 (43), 26/13)  
Lisboa, Hospital de St Antonio dos Capuchos, CIC 826, A Botelho de Sousa (24 (25), 0/24)  
Porto, Instituto Portugues de Oncologia, CIC 291, P Pimentel, F Campilho (57 (87), 33/24)  
Porto, Hospital S Joao, CIC 329, JE Guimaraes, F Principe (hem. onco) (25 (25), 0/25)

**Romania**: (three teams; 9 (9), 0/9)  
Bucharest, Fundeni University Hospital (hem), CIC 296, AD Moicean, D Colita, C Arion (2 (2), 0/2)  
Targu-Mures, Sectia Clinica de Hematologie, CIC 178, I Benedek (4 (4), 0/4)  
Timisoara, University of Medicine (Ill peds Hem/Onco), CIC 174, M Serban (3 (3), 0/3)

**Russia** (14 teams; 178 (192), 60/118)  
Ekaterinburg, City Hospital No. 7, LB Filatov (4 (4), 1/3)  
Ekaterinburg, Regional Hospital No. 1, TS Konstantinova, VA Shalaev (10 (12), 1/9)  
Moscow, Russian Children's Hospital (hem), CIC 694, A Maschan, E Skorobogato, E Pachanov (26 (28), 16/10)  
Moscow, Cancer Research Center, CIC 757, V Ptusckin (20 (20), 0/20)  
Moscow, Institute of Biophysics, AE Baranov (6 (7), 2/4)  
Moscow, Cancer Research Center peds Hem/onco, G Mentrevich (11 (11), 2/9)  
Moscow, Research Hematology Center of RAS, VG Savtchenko (29 (35), 14/15)  
Novosibirsk, Insitute of Clinical Immunology, CIC 376, I Lisukov (10 (10), 0/10)  
Samara, Regional Hospital, VA Rossiev (18 (18), 1/17)  
St Petersburg, Clinical Center for Advanced Medical Tech, CIC 370, E Podoltseva, V Soldatenkov, O Rysanyanskaya\*  
St Petersburg, Military Medical Academy (hem), CIC 520, A Novik\*  
St Petersburg, Research Institute of Hematology, KM Abdulkadirov (7 (7), 4/3)  
St Petersburg, State Pavlov Medical University (hem), CIC 725, BV Afanassiev, L Zubarovskaya (37 (40), 19/18)  
Yaroslavl, City Hospital No. 8, VA Lapin\*

**San Marino**: no report

**Slovakia** (four teams; 109 (116), 33/76)  
Bansra Bystrica, Roosevelt Hospital (hem), CIC 333, I Markuljak, E Kralikova (14 (20), 0/14)  
Bratislava, National Cancer Institute, CIC 560, J Lakota (53 (53), 8/45)  
Bratislava, University Hospital (hem), CIC 610, M Mistrik (33 (34), 22/11)  
Bratislava, University Hospital, 2nd Children's Clinic, CIC 684, J Lukac (9 (9), 3/6)

**Slovenia** (one team; 34 (38), 14/20)

Ljubljana, University Medical Centre (hem), CIC 640, J Pretnar (34 (38), 14/20)

**Spain** (76 teams; 1792 (1935), 455/1337)

Alicante, Hospital General, C Rivas-Gonzales (15 (15), 0/15)

Barcelona, Hospital Clinic (hem, onco), CIC 214, E Montserrat, E Carreras (83 (89), 30/53)

Barcelona, Santa Creu I Sant Pau (adults), CIC 260, J Sierra, S Brunet (82 (101), 29/53)

Barcelona, Santa Creu I Sant Pau (peds), CIC 260, I Badell Serra, J Cubells-Riero (9 (9), 4/5)

Barcelona, Santa Creu I Sant Pau (onco), CIC 260, Dr JJ Lopez, C Solà (6 (6), 0/6)

Barcelona, Hospital M Infantil, CIC 527, J Ortega (41 (43), 22/19)

Barcelona, Hospital Mutua de Terrasa (hem-onco), T Martí\*

Barcelona, Hospital General 'Vall d'Hebron', CIC 527, A Julia Font, J Zuazu (24 (26), 8/16)

Barcelona, Hospital Universitario Germans Trias i Pujol, CIC 613, J Ribera (30 (33), 6/24)

Barcelona, Hospital Sant Joan de Deu, CIC 668, J Estella Aguado (17 (21), 0/17)

Barcelona, Instituto Dexeus (hem), CIC 670, A Grañena, J Sarra, J Garcia (inactive)

Barcelona, Hospital Duran i Reynals (Hem), Institut Català d'Oncologia, CIC 759, A Grañena, C Ferra, J Berlanga (32 (33), 12/20)

Barcelona, Inst. Hemat. Torre Vilana, Cen. Medico Teknon, CIC 777, P Vivancos (inactive)

Barcelona, Instituto de Oncologia Corachan, D Alfonso-Modolell (1 (1), 0/1)

Caceres, Hospital San Pedro de Alcantara, M Luz Amigo Lozano (19 (20), 0/19)

Cadiz, Hospital del SAS de Jerez (hem), CIC 612, A Leon (27 (28), 5/22)

Cadiz, Hospital Universitario 'Puerta del Mar' (hem), CIC 679, J Gil (10 (10), 0/10)

Canary Isles, Las Palmas, Hospital Insular (hem), CIC 335, F Fernandez-Fuentes, J Gonzalez-San Miguel (7 (7), 0/7)

Canary Isles, Las Palmas, Hospital Materno-Infantil (haem, onco), J Lodos Rojas, A Molinés (0 (0), 0/0) starting 2003

Canary Isles, Las Palmas, Hospital Universitario de Gran Canaria 'Dr Negrin', T Molero, R Mataix, C Campo, S Jiménez (13 (14), 5/8)

Canary Isles, Tenerife, Hospital Universitario de Canarias, L Hernandez Nieto, MT Hernandez Garcia (23 (26), 0/23)

Canary Isles, Tenerife, Hospitatl NS de la Candelaria, P Rios Ru (10 (10), 0/10)

Castellon de La Plana, Hospital General de Castellon (haem), R Garcia-Boyero (7 (7), 0/7)

Cordoba, Hospital Reina Sofia (hem), CIC 238, A Torres Gomez (54 (54), 33/21)

Cordoba, Hospital de la Cruz Roja de Cordoba (haem), J-M Garcia-Castellano (1 (1), 0/1)

Cruces-Barakaldo, Hospital de Cruces (hem), CIC 393, I Zuazua-Verde, F Floristan (36 (36), 0/36)

Galdakao, Hospital de Galdakao, Hem, CIC 975, J Ojanguren, K Atutxa (11 (11), 0/11)

Granada, Hospital Virgen de la Nieves (hem), CIC 559, JM de Pablos Gallego (26 (31), 3/23)

Jaen, Hospital Ciudad de Jaen (haem), A Alcalam (19 (19), 0/19)

La Coruna, Complejo Hospitalario Juan Canalejo, CIC 361, FJ Batlle, C Ramirez, P Torres, R Varela (39 (42), 10/29)

Lérida, Hospital Arnau de Villanova, J Macia (8 (8), 0/8)

Lugo, Hospital Xeral-Calde, M Gonzales-Lopez (10 (10), 0/10)

Madrid, Hospital de la Princesa (hem), CIC 236, JM Fernández Rañada, A Figuera, A Alegre (62 (71), 33/29)

Madrid, Hospital Doce de Octubre, CIC 382, JJ Lahuerta (hem), H Cortés Funes (onco), J Lopez Perez (peds) (62 (69), 3/59)

Madrid, Hospital Ramon y Cajal (ads), CIC 615, J Odriozola, J Pérez de Oteyza, J Lopez, J Garcia Larana (27 (33), 5/22)

Madrid, Hospital Ramon y Cajal (peds), CIC 615, A Munoz Villa (10 (10), 5/5)

Madrid, Clinica Puerta de Hierro (hem), CIC 728, MN Fernandez (31 (33), 16/15)

Madrid, Hospital Nino Jesus (peds), CIC 732, LM Madero (34 (39), 13/21)

Madrid, Hospital Universitario San Carlos (hem), CIC 733, J Diaz Mediavilla, L Llorente, R Martinez (30 (30), 0/30)

Madrid, Hospital Universitario San Carlos (onco), CIC 733, M Martin (inactive)

Madrid, Hospital General La Paz (ads), CIC 734, F Hernandez Navarro, M Canales (43 (45), 7/36)

Madrid, Hospital La Paz Infantil (hem, onco), CIC 734, A Martinez-Rubio, A Sastre (25 (25), 10/15)

Madrid, Unidad de TMO-ONC 4, Hospital Gregorio Marañon, CIC 819, JL Diez Martin (30 (33), 9/21)

Madrid, Clinica La Luz, H Cortés-Funes, J Hornedo (0 (0), 0/0)

Madrid, Clinica Moncloa (hem), JM Fernandez, Q Escudero (13 (13), 0/13)

Madrid, Clinica Ruber, JM Fernandez-Ranada, Q Escudero (17 (17), 0/17)

Madrid, Hospital Ruber Internacional (onco), P Aramburo, J Diaz Mediavilla (2 (2), 0/2)

Madrid, Hospital Universitario de Getafe (hem), F Oña Compan, N Somolinos (14 (14), 0/14)

Madrid, Fundacion Jimenez Diaz (hem, onco), CIC 309, J Tomas, C Paniagua, F Lobo (15 (15), 3/12)

Madrid, Hospital Militar Gomez Ulla, F Sancho-Cuesta, S Enrech-Frances (0 (0), 0/0)

Malaga, Hospital Regional (hem), CIC 576, J Maldonado (32 (32), 17/15)

Murcia, Hospital 'Morales Meseguer' (hem, onco), CIC 735, JM Moraleda, V Vicente-Garcia, I Heras (22 (28), 9/13)

Murcia, Hospital Univ. 'Virgen de la Arrixaca', CIC 323, A Morales-Lazaro (14 (14), 0/14)

Orense, Hospital Cristal-Pinor (hem), J-L Sastre-Moral (9 (9), 0/9)

Oviedo, Hospital Covadonga (hem), CIC 642, D Carrera Fernandez (46 (46), 3/43)

Palma de Mallorca, Hospital Son Dureta (hem), CIC 722, J Besalduch, R Del Campo (36 (39), 12/24)  
Palma de Mallorca, Policlínica Miramar, J Besalduch, A Sampol (3 (3), 0/3)  
Pamplona, Hospital Provincial de Navarra (hem), CIC 577, E Pérez Equiza, MJ Uriz Pascual, J Gastearena (28 (28), 0/28)  
Pamplona, Clínica Universitario de Navarra, CIC 737, J Rifon (24 (27), 1/23)  
Pontevedra, Hospital Montecelo (onco), CIC 549, M Constela (17 (17), 0/17)  
Salamanca, Hospital Clínico (hem), CIC 727, D Caballero (75 (80), 27/48)  
San Sebastian, Hospital Nostra Senora de Aranzazu, CIC 598, J Marin, D Martinez (34 (43), 5/29)  
Santander, Hospital Universitario M de Valdecilla (hem), CIC 242, A Iriondo, E Conde (68 (75), 24/44)  
Santiago de Compostela, Hospital Xeral de Galicia (hem), CIC 570, JL Bello (24 (25), 8/16)  
Sevilla, Hospital Universitario Virgen del Rocío, CIC 769, JM Rodriguez Fernandez (45 (45), 21/24)  
Sevilla, Clínica Del Sagrado Corazon, JM Rodriguez (inactive)  
Tarragona, Hospital de Tarragona Joan XXIII (hem), A Llorente Cabrera (8 (8), 0/8)  
Valencia, Hospital Clínico Universitario (hem, onco), CIC 282, J Garcia-Conde, C Solano (41 (41), 8/33)  
Valencia, Hospital Infantil La Fe (peds, onco), CIC 653, V Castel, A Verdeguer (18 (18), 5/13)  
Valencia, Hospital Universitario La Fe (hem), CIC 663, MA Sanz, GF Sanz (63 (77), 33/30)  
Valencia, Hospital Doctor Peset (hem), P Ribas Garcia (4 (5), 0/4)  
Valencia, Instituto Valenciano de Oncología, I Picón (2 (2), 0/2)  
Valladolid, Hospital Rio Hortega, CIC 611, J Garcia Frade (22 (26), 0/22)  
Vigo, Hospital Xeral-Cies, A Martinez-Dalmau (24 (29), 2/22)  
Zaragoza, Clínico Universitario Lozano Blesa (hem), CIC 531, M Gutierrez, J Moreno, L Palomera (18 (18), 0/18)  
Zaragoza, Hospital Miguel Servet (hem + onco) M Giralt, G Pérez-Lugmus, D Rubio-Félix, A Anton (40 (40), 9/31)

**Sweden** (10 teams; 454 (517), 167/287)

Goteborg, CHECT (ads, peds), CIC 289, M Brune, A Fasth, J Abrahamson, K Mellgren, S Berg, S Óskarsdóttir (89 (114), 26/63)  
Huddinge, University Hospital (hem, onco), CIC 212, P Ljungman (86 (99), 58/28)  
Linköping, University Hospital (hem), CIC 740, G Juliusson (56 (63), 19/37)  
Lund, University Hospital (hem), CIC 283, AN Bekassy (73 (78), 19/54) Malmö, University Hospital, I Turesson\*  
Örebro, University Hospital (hem, onco), CIC 738, U Tidefelt (16 (17), 0/16)  
Stockholm, Karolinska Hospital (hem), CIC 626, M Björkholm (31 (31), 0/31)  
Umea, Norrland University Hospital, CIC 731, A Wahlin, P Hörnsten, J Lindh, L Eliasson (32 (42), 9/23)

Uppsala, University Hospital (ads, peds), CIC 266, I Hassan, G Oberg (71 (73), 36/35)

**Switzerland** (10 teams; 284 (381), 90/194)

Aarau, Kantonsspital (hem, onco), CIC 316, M Wernli, M Bargetzi (10 (15), 0/10)  
Basel, Kantonsspital (hem, onco), CIC 202, A Gratwohl, T Kühne, R Herrmann (58 (71), 37/21)  
Bellinzona, Ospedale San Giovanni (hem, onco), CIC 829, F Cavalli, M Ghielmini, L Leoncini (6 (13), 0/6)  
Berne, Inselspital (hem/onco), CIC 221, A Tobler, K Leibundgut, M Fey (32 (42), 0/32)  
Geneva, Hôpital Cantonal Universitaire (hem, onco), CIC 261, B Chapuis, Y Chalandon, P Wacker (19 (29), 16/3)  
Lausanne, CHUV (hem, onco), CIC 820, M Schapira, T Kovacovics, S Leyvraz, N Ketterer, N Nenadov-Beck (61 (88), 0/61)  
St Gallen (hem, onco), Kantonsspital, CIC 324, U Hess (10 (11), 0/10)  
Zurich, University Hospital (ads, hem, onco), CIC 208, U Schanz, J Halter, Ch Taverna (63 (82), 25/38)  
Zurich, University Hospital (peds, hem, onco), CIC 334, R Seger (17 (19), 12/5)  
Zurich, Klinik Im Park (onco), CIC 700, J Gmür, U Breitenstein (8 (11), 0/8)

**Tunisia** (one team; 51 (60), 32/19)

Tunis, Centre National de Greffe de Moelle Osseuse, CIC 183, B Othman (51 (60), 32/19)

**Turkey** (24 teams; 424 (462), 196/228)

Ankara-Sihhiye, Hacettepe University Medical School (hem), CIC 168, H Goker, O Ozcebe (6 (6), 6/0)  
Ankara-Besevler, Gazi University (hem), CIC 169, R Haznedar, starting in 2003  
Ankara, Gazi University Medical School (peds, hem, onco), CIC 182, O Gulyuz (inactive)  
Ankara, Hacettepe University, CIC 292, E Kansu, Y Koc (30 (40), 5/25)  
Ankara-Etlik, GATA BMT Center, CIC 372, F Arpacı, A Özet, C Beyan, A Ural (52 (55), 19/33)  
Ankara, Childrens Hospital Hacettepe University, A Tuncer, D Uckan (19 (20), 19/0)  
Ankara, University School of Medicine Ibni Sina Hospital (hem), CIC 617, G Gürman (63 (67), 31/32)  
Ankara, University of Ankara (peds), CIC 620, E Unal (8 (8), 7/1)  
Ankara, Numune Education and Research Hospital, CIC 691, S Dincerler, D Suleyman (57 (67), 31/26)  
Antalya, Akdeniz University Hospital (peds), CIC 618, MA Yesilipek, V Hazar, O Yegin (10 (11), 10/0)  
Antalya, Akdeniz University Hospital (hem), CIC 685, L Undar (15 (16), 7/8)  
Balcali, Cukurova University Hospital (peds, hem, onco), CIC 821, A Tanyeli (6 (6), 5/1)  
Bornova-Izmir, Ege University Medical Faculty (peds), CIC 621, S Kansoy (6 (6), 2/4)  
Bornova-Izmir, Ege University Medical Faculty (ads, hem), CIC 628, S Cagirgan (31 (36), 2/29)  
Eskisehir, Osmangazi University, CIC 686, Z Güblas (9 (9), 7/2)

Istanbul, Maltepe Medical Faculty, CIC 210, K Ozerkan, A Tamkan (0 (0), 0/0) starting 2004  
 Istanbul, Marmara University (hem), Altunizade, CIC 714, T Akoglu (8 (8), 2/6)  
 Istanbul, University of Istanbul, CIC 760, S Kalayoglu-Besisik (21 (22), 11/10)  
 Istanbul, Cerrahpasa Medical School, CIC 761, B Ferhanoglu, T Soysal, Z Baslar (25 (25), 10/15)  
 Istanbul, Tip Fakultesi (peds, hem, onco), CIC 762, G Gedikoglu (11 (11), 10/1)  
 Istanbul, GATA Haydarpasa Egitim Hast (hem, onco), CIC 687, A Öztürk (4 (4), 0/4)  
 Istanbul, Institute of Oncology, CIC 689, H Onat, M Basaran (6 (6), 0/6)  
 Izmir, Dokuz Eylul University (onco), CIC 688, U Yilmaz (0 (0), 0/0) restart 2003  
 Kayseri, Erciyes University Hospital (hem, onco), CIC 627, A Unal, M Cetin (26 (28), 10/16)  
 Trabzon, Karadeniz Technical University (hem), CIC 170, E Ovali (11 (11), 2/9)

**Ukraine:** (two teams; 45 (55), 1/44)

Kiev, Kiev City BMT Center, CIC 176, E Karamanescht, V Khomenko, I Korenkova, S Borodkin (39 (46), 0/39)  
 Kiev, Kiev Regional Oncologic Hospital (peds, hem, onco), CIC 177, S Donska, O Ryzhak (6 (9), 1/5)

**United Kingdom** (53 teams; 2108 (2261), 825/1283)

Aberdeen, The Royal Infirmary (hem), CIC 344, DJ Culligan (13 (13), 1/12)  
 Bangor, Gwynedd Hospital (hem, onco), CIC 736, M Gilleece (12 (16), 0/12)  
 Bath, Royal United Hospital (hem), CIC 619, C Knechtli (8 (8), 0/8)  
 Belfast, Belfast City Hospital (hem), CIC 268, F Jones, TCM Morris, P Abram (30 (30), 8/22)  
 Birmingham, Heartlands Hospital (hem), CIC 284, DW Milligan (37 (42), 11/26)  
 Birmingham, Queen Elizabeth Hospital (hem), CIC 387, C Craddock, P Mahendra (101 (106), 39/62)  
 Birmingham, The Birmingham Childrens Hospital (hem), CIC 781, PJ Darbyshire (36 (41), 27/9)  
 Bournemouth, Royal Bournemouth Hospital (hem), CIC 765, S Killick, J Cullis (13 (13), 0/13)  
 Bristol, University of Bristol Royal Hospital for Children and Avon Haematology Unit, CIC 386, JM Cornish, D Marks, J Hows (105 (107), 69/36)  
 Cambridge, Addenbrooke's Hospital (hem), CIC 566, C Crawley, RE Marcus, J Craig, H Balsdon, T Chapman (50 (52), 12/38)  
 Cardiff, University Hospital of Wales (hem), CIC 303, KMO Wilson, AK Burnett, JA Whittaker, CH Poynton (31 (37), 8/23)  
 Cheltenham, Cheltenham General Hospital, E Blundell (10 (10), 0/10)  
 Coventry, University Hospital and Warwickshire NHS Trust, N Jackson (15 (16), 0/15)  
 Dundee, Ninewells Hospital (hem), CIC 719, D Bowen (7 (7), 0/7)

Edinburgh, Western General Hospital, (hem), CIC 228, JM Davies, PRE Johnson, MJ Mackie, PH Roddie (37 (37), 12/25)  
 Exeter, Royal Devon and Exeter Hospital (hem), CIC 571, M Joyner (8 (10), 0/8)  
 Glasgow, Royal Infirmary, CIC 244, A Parker, IG McQuaker (63 (73), 30/33)  
 Glasgow, The Western Infirmary (hem), CIC 325, T Fitzsimons (15 (15), 0/15)  
 Glasgow, Royal Hospital for Sick Children (hem), CIC 707, B Gibson (12 (12), 10/2)  
 Leeds, St James's University Hospital and The General Infirmary, CIC 254, S Kinsey, G Cook (120 (120), 35/85)  
 Leicester, Royal Infirmary (hem), CIC 713, AE Hunter (58 (67), 18/40)  
 Liverpool, Royal Liverpool University Hospital (hem), CIC 501, RE Clark, A Pettitt (44 (51), 15/29)  
 Liverpool, Alder Hay, CIC 773, M Caswell (10 (10), 2/8)  
 London, Hammersmith and Charing Cross Hospital, CIC 205, JM Goldman, J Apperley, D Samson, C Giles, E Kanfer (122 (133), 64/58)  
 London, Royal Free Hospital (hem), CIC 216, M Potter (60 (60), 51/9)  
 London, Royal Marsden Hospital, CIC 218, R Powles, J Mehta (126 (147), 25/101)  
 London, University College Hospital (onco), CIC 224, J Whelan (17 (17), 0/17)  
 London, University College Hospital (hem), CIC 224, S MacKinnon (105 (115), 35/70)  
 London, Great Ormond Street Hospital, CIC 243, P Veys (51 (54), 40/11)  
 London, The London Clinic (hem), CIC 263, PJ Gravett (4 (6), 0/4)  
 London, St George's Hospital (hem), CIC 539, J Marsh, S Ball, EC Gordon-Smith (26 (26), 15/11)  
 London, Guy's Hospital (hem), CIC 721, S Schey (33 (37), 8/25)  
 London, King's College (hem), CIC 763, A Pagliuca, GJ Mufti (74 (81), 47/27)  
 London, St Bartholomew's, CIC 768 and the Royal London Hospital M Barnett, AC Newland, J Cavenagh (62 (64), 19/43)  
 Manchester, Royal Children's Hospital, CIC 521, AM Will (18 (21), 16/2)  
 Manchester, The Royal Infirmary, JA Yin (33 (40), 24/19)  
 Manchester, Christie Hospital (hem), CIC 780, R Chopra (86 (97), 27/59)  
 Manchester, Hope Hospital, PA Carrington (5 (5), 0/5)  
 Manchester, Trafford General Hospital, PA Carrington (2 (2), 0/2)  
 Newcastle upon Tyne, Royal Victoria Infirmary, CIC 276, GH Jackson, SJ Proctor, P Taylor, A Cant, R Skinner (94 (99), 47/47)  
 Norwich, Norfolk and Norwich Hospital (hem), CIC 391, J Parker, G Turner (4 (4), 0/4)  
 Nottingham, City Hospital, CIC 717, N Russell, JL Byrne, AP Haynes (95 (102), 51/44)

Oxford, John Radcliffe Hospital (hem, onco), Headington, and Wycombe General Hospital, CIC 255, TJ Littlewood, C Bunch, C Mitchell, C Hatton, G Hall, J Wainscoat (48 (48), 18/30)  
Plymouth NSH Trust, Derriford Hospital, CIC 823, MD Hamon (34 (35), 10/24)  
Poole, Poole Hospital, Dorset Cancer Centre and Salisbury District Hospital, CIC 765, A Bell (24 (24), 0/24)  
Sheffield, Royal Hallamshire Hospital, J Snowdon; Weston Park Hospital, L Evans;  
Rotherham General Hospital, H Barker and the Children's Hospital, A Vora, CIC 778:1/2/3/5 (52 (52), 16/36)  
Somerset, Taunton and Somerset Hospital SA Johnson, S Bolam (10 (10), 1/9)  
Southampton, CRC Wessex, CIC 704, K Orchard, A Duncombe, J Kohler (60 (61), 14/46)  
Stoke-on-Trent, North Staffordshire Royal Infirmary (hem), CIC 394, R Chasty (6 (6), 0/6)  
Sunderland, The Sunderland Royal, PJ Carey (7 (7), 0/7)  
Swansea, Singleton Hospital, Skett, S Al Ismail (4 (4), 0/4)  
Swindon, Great Western Hospital (Hem), CIC 608,

NE Blesing, A Gray, S Green, A Koster (7 (7), 0/7)  
Wakefield, Pinderfield's and Pontefract Hospitals NHS Trust, CIC 254, MC Galvin (4 (4), 0/4)

**Yugoslavia (Serbia and Montenegro)** (four teams; 23 (23), 8/15)

Belgrade, Mother and Child Health Institute, CIC 358, D Vujic (1 (1), 1/0)

Belgrade, Clinical Centre of Serbia (hem), CIC 373, M Colovic, A Bogdanovic (0 (0), 0/0)

Belgrade, Military Medical Academy (hem), CIC 582, M Malesevic (22 (22), 7/15)

Novi Sad, Institute of Internal Diseases, Clinical Centre of Novi Sad (hem), CIC 655, D Pejin (0 (0), 0/0)

Inactive: currently not transplanting

\*No report

\*\*Late data/correction, not included in tables and figures

**Final data 2002: 20 207 (24 154), 6915/13 292)**

November 2003