SPECIAL REPORT

The EBMT activity survey 2008 impact of team size, team density and new trends

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Six hundred and fifteen centers from 45 countries reported a total 30293 HSCT to this 2008 EBMT survey with 26810 first transplants (40% allogeneic, 60% autologous). This corresponds to an increase of 7% for the allogeneic and 3% for the autologous HSCT. Main indications were leukemias (32%; 89% allogeneic); lymphomas (56%; 89% autologous); solid tumors (6%; 96% autologous); and non-malignant disorders (6%; 88% allogeneic). There were more unrelated than HLA-identical sibling donors (49 vs 46%). The proportion of peripheral blood transplants remained stable with 99% for autologous and 70% for allogeneic HSCT. One fifth of the teams with >80 HSCT performed more than half of all HSCT. This trend towards teams with higher numbers of HSCT was stronger for allogeneic (Gini coefficient 57%) than for autologous HSCT (Gini coefficient 38%). Transplant rates (number of transplants per 10 million inhabitants) increased in a close to linear way with increasing team density (number of transplant teams per 10 million inhabitants) and without saturation ($R^2 = 0.54$); this connection was even stronger for allogeneic HSCT ($R^2 = 0.67$). These data illustrate status and trends for HSCT in Europe. They provide a rational basis for planning and patient counseling.

**Keywords:** hematopoietic SCT; stem cell source; Europe; transplant rates; team density

Introduction

This 2008 activity report joins the past series of annual surveys of the European Group for Blood and Marrow Transplantation EBMT, which has become an important instrument to describe the status of hematopoietic SCT (HSCT) in Europe to observe trends and to monitor changes in technology use.¹⁻⁴ It captures the numbers of HSCT in the preceding year from each participating team by indication, donor type and stem cell source. Thanks to the near 20-year history of the survey, its standardized structure over many years and the excellent commitment by the participating teams, observation of changes over the years and short to mid-term predictions of trends have become possible.⁵⁻⁷

The reports have given detailed annual numbers and have focused each year on one specific aspect such as stem cell source, donor type or a defined disease category. In recent years, the numbers of donor lymphocyte infusions were added. Since 2007, the survey collects in collaboration with sister organizations in Europe, information on other cellular therapies besides standard HSCT, such as mesenchymal stem cell therapies and HSCT for non-hematological indications.

Previous analyses indicated an impact of team size and team density on transplant rates and a high predictability of transplant rates⁸. Little distinction was made between donor types and disease classification. In addition, the ongoing discussions in several European countries on optimal use of infrastructure and on optimal numbers of HSCT per teams warrant data on the current situation. Therefore, our interest was for a more detailed analysis on the distribution of number of transplants by the participating teams and on the impact of team density on transplant rates of different disease indications. In addition, we tried to establish some short and mid-term predictions.⁵ Key aspects of these findings are presented in this report.

Patients and methods

Data collection and validation

Participating teams were requested to report their data for 2008 by indication, stem cell source and donor type as listed in Table 1 and as in preceding years. Quality control measures included several independent systems: confirmation...
of validity of the entered data by the reporting team, selective comparison of the survey data with MED-A data sets in the EBMT ProMISE data system, cross-checking with the National Registries and onsite visits of selected teams.

Teams

637 teams in 47 countries (39 European and 8 affiliated countries) were contacted for the 2008 report, of which 615 (36 European, 8 affiliated countries) reported their numbers. This corresponds to a 97% return rate and includes 499 active EBMT member teams and includes two more responding teams than in 2007 (613 teams). Twenty-three teams, for unknown reasons, chose not to reply. Contacted teams are listed in the Appendix in alphabetical order by country, city, EBMT center code, and with their numbers of first, total HSCT, allogeneic and autologous first HSCT. According to information received there were no blood or marrow transplants performed in Albania, Andorra, Armenia, Georgia, Liechtenstein, Malta, Moldavia, Monaco, Montenegro, San Marino and the Vatican in 2008. Non-European countries participating in the EBMT include Algeria, Iran, Israel, Jordan, Lebanon, Saudi Arabia, South Africa and Tunisia. Their data are included in all of the analyses.

Table 1

<table>
<thead>
<tr>
<th>Number of hematopoietic stem cell transplants in Europe 2008 by indication, donor type and stem cell source</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Proportion PB</strong></td>
</tr>
<tr>
<td><strong>Donor type</strong></td>
</tr>
<tr>
<td>Leukemias</td>
</tr>
<tr>
<td>Acute myeloid leukemia</td>
</tr>
<tr>
<td>Acute lymphatic leukemia</td>
</tr>
<tr>
<td>Chronic myeloid leukemia</td>
</tr>
<tr>
<td>Myelodysplastic syndrome</td>
</tr>
<tr>
<td>Myeloproliferative syndrome</td>
</tr>
<tr>
<td>Chronic lymphatic leukemia</td>
</tr>
<tr>
<td>Lymphoproliferative disorders</td>
</tr>
<tr>
<td>Plasma cell disorders</td>
</tr>
<tr>
<td>Hodgkin's lymphoma</td>
</tr>
<tr>
<td>Non Hodgkin's lymphoma</td>
</tr>
<tr>
<td>Neuroblastoma</td>
</tr>
<tr>
<td>Soft tissue sarcoma</td>
</tr>
<tr>
<td>Germinal tumors</td>
</tr>
<tr>
<td>Ewing's sarcoma</td>
</tr>
<tr>
<td>Other solid tumors</td>
</tr>
<tr>
<td>Non malignant disorders</td>
</tr>
<tr>
<td>Bone marrow failures</td>
</tr>
<tr>
<td>Hemoglobinopathies</td>
</tr>
<tr>
<td>Primary immune deficiencies</td>
</tr>
<tr>
<td>Inherited disorders of metabolism</td>
</tr>
<tr>
<td>Autoimmune disease</td>
</tr>
<tr>
<td>Others</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

\( ^a \)Proportion of cord blood allogeneic HSCT.

\( ^b \)Proportion of family donor cord among all cord HSCT.

\( ^c \)Percentage of increase or decrease in HSCT from 2007 to 2008 and trends. Calculated for indications with more than 100 HSCT only.

\( ^d \)Includes secondary acute leukemias.

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was collected generically, with the following definitions: Re-transplants (autologous or allogeneic) define an unplanned HSCT for rejection or relapse after a previous HSCT. Multiple transplants define subsequent transplants within a planned double or triple autologous or allogeneic transplant protocol. Information on stem cell source includes BM, peripheral blood or cord blood; transplants with more than one source were categorized as peripheral blood HSCT. Information on numbers of reduced intensity conditioning transplants (RIC HSCT), as defined by EBMT (www.ebmt.org) was collected generically and not for individual transplants.

Information on additional cellular therapies was limited to number of donor lymphocyte infusions, mesenchymal stromal cell therapies, HSCT for non-hematopoietic use or non-hematopoietic stem cell therapies as outlined in Table 2. Collection of information was harmonized with identical surveys by EULAR (European League against Rheumatism; www.eular.org) and TERMIS-EU (Tissue Engineering and Regenerative Medicine International Society; www.termis.org).6

Transplant rates
Transplant rates, defined as numbers of HSCT per 10 million inhabitants, were computed for each country without adjustments for patients who crossed borders and received their HSCT in a foreign country. Population numbers were obtained from the US census office database (www.census.gov).

Team size and density
Team size was defined as the number of first HSCT for patients transplanted in the year 2008. Team size was analyzed separately for total HSCT, allogeneic or autologous HSCT only. Team density was defined as numbers of transplant teams per 10 million inhabitants and was computed for each country, for the total of all HSCT as well as separately for autologous and allogeneic HSCT.

Table 2 Numbers of novel cellular therapies in Europe 2008

<table>
<thead>
<tr>
<th></th>
<th>Allogeneic</th>
<th>Autologous</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mesenchymal cell infusions</td>
<td>210</td>
<td>147</td>
<td>357</td>
</tr>
<tr>
<td>Hematopoietic stem cells for Non hematopoietic use</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cardiovascular</td>
<td>4</td>
<td>309</td>
<td>313</td>
</tr>
<tr>
<td>Neurological</td>
<td>61</td>
<td>13</td>
<td>74</td>
</tr>
<tr>
<td>Tissue repair</td>
<td>6</td>
<td>61</td>
<td>67</td>
</tr>
<tr>
<td>Total</td>
<td>281</td>
<td>530</td>
<td>811</td>
</tr>
</tbody>
</table>

Statistical analysis
The relation between transplant rates and team density is estimated by ordinary least squares and its explanatory content expressed by the coefficient of determination (R²). Multiple regression analyses assess trends over time. The Gini coefficient1 classifies the inequality among transplantation teams for different types of treatment with respect to the number of HSCT.

Results
Activity of participating teams
Of the 615 teams, 370 (60%) did both allogeneic and autologous transplants; 222 (36%) restricted their activity to autologous, 10 teams (2%) to allogeneic transplants. 13 teams (2%) reported having performed no transplants in 2008.

There was substantial variation in the number of HSCT performed by the participating institutions. Forty-seven teams (8% of all teams) reported 1–5 HSCT (0.3% of all HSCT), 143 teams (23%) 6–20 HSCT (6%), 201 teams (33%) 21–50 HSCT (22%), 145 teams (24%) 51–100 HSCT (34%), 58 teams (9%) 101–150 HSCT (23%) and 21 teams (3%) more than 150 HSCT (14%). Hence, it took typically around four small teams to match the average number of transplants that a large institution performed.

The 117 teams (roughly a fifth of all teams) with more than 80 HSCT performed over 50% of all transplants in 2008. Hence, the contribution of small teams and large teams to the total of all transplants was unequal with a higher contribution of larger teams as exemplified by the Lorenz curve in Figure 1. If all teams would contribute equally, the coefficient would be zero and equal to the 45° C curve. It is of interest to note that this inequality is nearly identical for allogeneic (Gini coefficient 45%) and autologous HSCT (Gini coefficient 44%) as for the total of HSCT (Gini coefficient 46%).

Numbers of HSCT in 2008
First transplants 2008. A total 26 810 first transplants, 10 782 (40%) allogeneic and 16 028 (60%) autologous were carried out in 2008 (Table 1). Overall, this corresponds to a 5% increase in the number of HSCT when compared with 2007, when there were 25 563 first transplants. Numbers of autologous HSCT increased by 7% from 10 072 in 2007 to 10 782 in 2008 and the numbers of autologous increased by 3.5% from 15 491 in 2007 to 16 028 in 2008.

Additional transplants 2008. There were 1751 re-transplants (8610 allogeneic/890 autologous) and 1732 additional planned multiple transplants (102 allogeneic/1630 autologous). Thus, there were a total of 30 293 HSCT procedures, 11 745 allogeneic (39%) and 18 548 autologous (61%) performed in 2008. This corresponds to an increase of 89 re-transplants (51 allogeneic and 31 autologous) or 5% when compared with 2007. In contrast, there was a decrease of 4% in tandem transplants from 522 in 2007 to 503 in 2008. Main indications for the tandem transplants were, as in the previous years, multiple myeloma, Non-Hodgkin’s lymphoma and Hodgkin’s lymphoma. It is interesting to note that there were 32 such procedures reported for acute myeloid leukemia beyond first CR.

Disease indications
Numbers in 2008. Indications for HSCT in 2008 are listed in detail in Table 1. Main indications were lymphoproliferative disorders with 15 127 patients (56%), 1699 patients with autologous HSCT (11%), 13 428 with autologous HSCT (89%); leukemias with 8610 patients (32%), 7632
patients with allogeneic (89%), 978 autologous (11%) HSCT; solid tumors with 1486 patients (6%), 62 with allogeneic HSCT (4%), 1424 with autologous HSCT (96%) and non-malignant disorders with 1486 patients (6%), 1314 with allogeneic HSCT (88%), 172 with autologous HSCT (12%). The latter, autologous HSCT for non-malignant disorders predominantly include patients with autoimmune disorders (N = 163). An additional 101 patients (0.4%), 75 with allogeneic HSCT and 26 with autologous HSCT were listed as ‘other indications’.

Trends since 2007. Not all indications increased at the same rate when compared with the 2007 data and there were some clear trends (Table 1). Highest increases in allogeneic HSCT were observed for patients with non-malignant disorders (+15%), specifically for BM failure syndromes (+18%), hemoglobinopathies (+18%) and inherited disorders of metabolism (+43%). Above average increases for patients with malignancies were noted for AML beyond first CR (+12%), myeloproliferative syndromes (+22%), and chronic lymphocytic leukemia (+14%). It is interesting to note that number of allogeneic HSCT for CML in the first chronic phase continued to decline and were for the first time ever lower than the numbers of allogeneic HSCT in the advanced phase, which continued to increase (+2%). Overall, numbers of HSCT for CML decreased by 11%. Highest increases in autologous HSCT were observed for patients with leukemias (+8%), specifically for ALL (+19%) and AML (+9%). Numbers increased on average for all lymphoproliferative disorders by about 3%, with the exception of non-myeloma plasma cell disorders (−22%). Numbers of autologous HSCT for solid tumors continued to decrease with the exception of neuroblastoma (+15%) and germinal tumors (+6%). Among the non-malignant disorders, numbers increased for autoimmune disorders by 9% (Table 1).

Donor type and stem cell source
Stem cell source in 2008. Of the 16028 autologous first transplants, 200 (1%) were BM derived and 15828 (99%) were derived from PBSCs or from combined peripheral blood and BM. There were no autologous HSCT reported for cord blood cells (Table 1). Of the 10782 allogeneic first transplants, 2445 (23%) were BM, 7631 (70%) were peripheral blood and 706 (7%) were cord blood transplants. This indicates that the trend from BM to peripheral blood as stem cell source for allogeneic HSCT has stabilized over the last 2 years (2006, 70% peripheral blood; 2007, 71% peripheral blood, 2008, 70% peripheral blood). The proportion of peripheral blood as stem cell source increased from 68% for unrelated and twin donors to 73% for HLA-identical sibling donors and to 76% for other family member donors.

Stem cell source was influenced by main indication. BM remained the preferred source of stem cells for non-malignant disorders (56%) with even a higher proportion of BM for HLA-identical sibling donors (63%). In contrast, peripheral blood was the preferred choice for malignant disorders (Figure 2) with the highest proportion of peripheral blood for leukemias (79%, Table 1). Interestingly, the proportion was the same for patients with acute leukemia in first CR or with CML in first chronic phase as for patients with advanced leukemias. Overall, the proportion of peripheral blood has slightly decreased over the past years for malignant disease indications (Figure 2).

There were 706 first HSCT with cord blood in 2008, which corresponds to an increase of 21% from the 585 cord blood HSCT in 2007. Of these were 7% HLA-identical
sibling cord blood HSCT, 0.2% other family donor cord blood HSCT and 93% unrelated cord blood HSCT. It is of interest to note that targeted cord blood HSCT (family donor HSCT) was almost exclusively used for non-malignant disorders (Table 1). There was no autologous cord blood HSCT reported in 2008, and no cord blood HSCT for non-hematopoietic use. There were 783 cord blood HSCT (first HSCT plus non-first HSCT) performed by 162 teams in 28 countries. Median number of cord blood HSCT in teams performing cord blood HSCT was three (range 1–37). Forty-two teams reported more than five cord blood HSCT in 2008.

Donor type in 2008. For the 10 782 allogeneic first transplants, HLA-identical siblings were used as donors for 4923 (46%) of the recipients, other family members for 523 (5%) of the recipients, a syngeneic twin for 44 (0.4%) of the recipients and an unrelated volunteer donor for 5292 (49%) of the recipients. This confirms the trend over recent years of an increasing proportion of unrelated donors, which has exceeded the proportion of HLA-identical sibling donor transplants for the first time (Figure 3). The proportion of unrelated donors compared with HLA-identical sibling donors differed from disease to disease with the highest in AML not in first CR, MDS and inherited disorders of metabolism and the lowest in hemoglobinopathies.

Use of reduced intensity conditioning in 2008
Numbers of RIC HSCT continued to increase from 3914 in 2007 to 4397 in 2008 at the same rate as allogeneic HSCT. RIC was used for 37% of all allogeneic HSCT, similar to that of last year’s survey. This information is collected in a generic way only; no information on disease distribution is possible through the activity survey.

Additional cellular therapies
There were 1852 patients reported as having received donor lymphocyte infusions in 2008; this corresponds to 16% of all patients with an allogeneic HSCT and to about 42% of reported patients with RIC HSCT. Numbers are similar to those in 2007 with 1898 DLI. No information on the disease indication of those patients with DLI is available from the activity survey. Similarly, no information is obtained on preemptive use or on treatment for relapse.

Table 2 summarizes the use of additional cellular therapies in Europe. There were 357 mesenchymal stem cell transplants performed by 55 teams in 21 countries (Austria, Belgium, Finland, Germany, Greece, Iran, Israel, Italy, Lebanon, Luxembourg, Netherlands, Poland, Portugal, Russia, Serbia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom). Indications for these transplants were musculoskeletal, neurological, epithelial and autoimmune disorders. There were 454 HSCT for non-hematopoietic use by 31 teams in 13 countries. This includes 313 (69%) HSCT for cardiovascular disorders, 74 (16%) HSCT for neurological disorders, and 67 (15%) HSCT for tissue repair. These numbers represent a substantial increase from last year with 212 mesenchymal stem cell transplants and 212 HSCT for non-hematopoietic use in 2007.

Team density and transplant rates
Transplant rates differed substantially between European countries and countries affiliated with the EBMT (Figure 4). These differences relate to all types of HSCT. Total transplant rates (Figure 4a) in Europe ranged from 11 HSCT per 10 million inhabitants in the Ukraine to 848 (median: 293). As in previous years, the transplant rate was highest in Israel, a country that is known to accept patients across borders for HSCT. Transplant rates for allogeneic HSCT (Figure 4b) ranged from 1 (several countries) to 496 in Israel (median: 72). They ranged from 2 (several countries) to 607 in Iceland (median: 215) for autologous HSCT (Figure 4c).

Transplant rates were associated with World Bank Category and Gross National Income per Capita (data not shown). They were also associated with team density. There were 13 out of 47 participating countries with only one reporting transplant team. These countries either belonged to the low income World Bank Category or were countries with less than 3 million inhabitants. In the
remaining countries, the number of transplant teams ranged from 1 to 107 in Germany (median: 5), with 1 to 65 allogeneic (median: 3) and 1 to 101 autologous transplant teams (median: 4.5).

Team density ranged from 0.2 (Ukraine) to 35.7 (Iceland) per 10 million inhabitants (median: 6.1) for all HSCT, from 0.2 (Ukraine) to 12.5 (Belgium, median: 4.2) for allogeneic, and from 0.2 (Ukraine) to 35.7 (Iceland, median: 6.1) for autologous HSCT.

The logarithm of transplant rates increased with increasing team density in a close to linear way (Figures 5). Hence, an expansion of the number of teams by a fixed percentage raises the number of transplantation by a proportional growth factor with no clear indication for saturation. The explanatory content reached a level of $R^2 = 54\%$ for both total HSCT (5a) and allogeneic HSCT (5b), and the connection was even stronger for autologous HSCT ($R^2 = 67\%$, Figure 5c). A comparable pattern applies for AML allogeneic HSCT ($R^2 = 56\%$, Figure 5d) and PCD autologous HSCT ($R^2 = 78\%$, Figure 5e), the most frequent indications of the autologous and allogeneic subsample. The same figures for the data of 2002 reveal very similar patterns but steeper slopes of the regression equations.9 The decline of these coefficients from roughly 1.0–1.2 to around 80–90% might serve as a first sign of saturation. However, no significant threshold value of the team density by which transplantation rates do not rise any more could be found.

**Discussion**

Data from this report describe the current state of art of HSCT in Europe in 2008. They document and confirm the ongoing role of autologous and allogeneic stem cells for a broad range of malignant and non-malignant disorders.10 In addition, they show some novel and interesting trends.

These most recent data confirm the steady increase in allogeneic HSCT by 7% and in autologous HSCT by 3.5%. They show too that the increase is not the same for all indications. The increase in allogeneic HSCT is most marked for leukemias and non-malignant disorders, especially hemoglobinopathies and inborn errors of metabolism. This increase is clearly associated with the increasing availability of unrelated donors, including unrelated cord blood products, and with the clear indications for an allogeneic HSCT in defined situations of acute leukemias.11–13 There are only two disease categories with a decline in allogeneic HSCT: solid tumors and chronic myeloid leukemia in first chronic phase. For the first time,
there were more transplants in CML in advanced phases of the disease than in first chronic phase. This is somehow surprising in view of the fact that outcome of HSCT for CML is so clearly superior if the transplant is performed still in chronic phase and monitoring of the disease and failed response to imatinib can be captured in principle in time.\textsuperscript{14,15} Information of the CML community relating to this fact appears warranted.

The increase in autologous HSCT is seen for acute leukemias and all types of lymphoproliferative disorders. This is somehow surprising and there is apparently no obvious trend yet to refrain from autologous HSCT despite the new modern drugs for patients with myeloma or lymphoma.\textsuperscript{16} In contrast, autologous HSCT for solid tumors continues to decline, with the exception of the few entities with clear prospective randomized studies documenting an advantage for autologous HSCT compared with standard chemotherapy. Breast cancer, the leading indication a decade ago has almost become a non-entity.\textsuperscript{17,18}

There were several interesting observations on changes and trends in the use of stem cell source. For autologous HSCT, peripheral blood remains almost the sole source of stem cells and no single autologous cord blood stem cell transplant was reported by the 615 participating teams. This observation clearly contrasts with the advertising activity of private cord blood banks but supports the EBMT guidelines on the use and storage of cord blood for private use. In contrast, autologous HSCT for plasma cell disorders. Red = high income countries; green = middle income countries; blue = low income countries by World Bank category (www.worldbank.org).

**Figure 5** Association between transplant rates and team density (both as logarithms of the number per 10 million inhabitants) in Europe 2008. (a) Team density and transplant rates for all HSCT, allogeneic and autologous combined. (b) Team density and transplant rates for allogeneic HSCT. (c) Team density and transplant rates for autologous HSCT. (d) Team density and transplant rates for allogeneic HSCT for AML. (e) Team density and transplant rates for autologous HSCT for plasma cell disorders. Red = high income countries; green = middle income countries; blue = low income countries by World Bank category (www.worldbank.org).
diseases was the same in early and advanced disease stage despite some indications that patients in early disease might profit more from BM.\textsuperscript{21}

Team size or the number of procedures by a team in a given period has been intensively discussed, not only in the field of HSCT. Some studies indeed suggest that the annual number of procedures in a team might have an impact on outcome. This has been observed in HSCT, in organ transplantation and complex medical interventions.\textsuperscript{22–27} The survey cannot give an answer on the correct number of HSCT per year. The data only show that the vast majority of transplants are performed in teams undertaking more than 50 HSCT per year. In smaller countries, a small team might provide the necessary infrastructure.\textsuperscript{7} There is a clear association between team density, the number of teams per number of inhabitants and transplant rates. Patients need to have access to the procedure. So far, there is no indication for saturation, hence no indication that teams overuse their facilities. This applies to all HSCT as well as to the most frequent indications for allogeneic (AML) or autologous (PCD) HSCT. Compared with the first analysis in 2002, there are changes in the steepness of the correlation curve; this might be a first indication that in countries with very high team densities, saturation might be close. An optimal number of team density or team size cannot be given by the data. Still, assumptions can be made: one team per 1 million might be needed to provide optimal service; the overall contribution of the 190 teams with less than 20 HSCT per year is marginal with 6.3% of all HSCT.

For the first time, the survey collected data on the use of mesenchymal stromal cell therapies and on hematopoietic stem cells for non-hematopoietic indications. These data indicate a wide spread use. Main indications include cardiovascular regeneration, neurological disorders or tissue repair. These data have to be regarded with caution. Not all teams performing HSCT are in contact with their colleagues from other fields in medicine. More time is needed to establish a comprehensive survey on tissue engineering and regenerative medicine cellular therapies. The preliminary data from this survey should serve as a stimulus to do so.

In summary, the report 2008 describes the status of HSCT in Europe and gives a clear perspective for patient counseling and health care planning.

Conflict of interest

The authors declare no conflict of interest.

Acknowledgements

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References


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Appendix 2008

List of transplant centers in 2008

(Total 1st HSCT (total all HSCT) N allogeneic first HSCT/N autologous first HSCT)

Albania: no report
Andorra: no report
Armenia: no report
Algeria (1 team) (133 (137) 95/38)
Belgium (3 teams) (331 (368) 140/191)
Brasil, Brazil (1 team) (58 (62) 27/31)
Camp, A Schots (27 (30 12/15)
Andorra: no report
Armenia: no report
Algeria: no report
Brasil, Brazil (1 team) (58 (62) 27/31)
Camp, A Schots (27 (30 12/15)

Appendix 2008

List of transplant centers in 2008

(Total 1st HSCT (total all HSCT) N allogeneic first HSCT/N autologous first HSCT)

Albania: no report
Andorra: no report
Armenia: no report
Belgium (19 teams) (62 (709) 268/358)
Brasil, Brazil (1 team) (58 (62) 27/31)
Camp, A Schots (27 (30 12/15)

Azerbaijan: no report
Baku, Azerbaijan Central Clinic Hospital, CIC 186, S Dincer (no report)

Belarus, Republic of (2 teams) (118 (132) 41/77)
Minsk, Belorussian Center (hem, onco, peds), CIC 591, E Aleinikova (58 (62) 27/31)
Minsk, Hospital No. 9, N Milanovitch (60 (70) 14/46)
Brasil, Brazil (1 team) (58 (62) 27/31)
Camp, A Schots (27 (30 12/15)

Belgium (19 teams) (62 (709) 268/358)
Antwerpen, Stuivenberg ZH and AZ Middelheim (hem), CIC 339, P Zaccée, R de Bock (37 (48) 18/19)
Antwerpen-Edewede, University Antwerpen (hem), CIC 996, W Schroyens (26 (29) 15/11)
Brugge, AZ St Jan (hem), CIC 506, D Selleslag, A Van Hoof, J Van Droogenbroeck, K Van Eygen (67 (72) 22/45)
Brussels, Institut Jules Bordet and the Children’s University Hospital, CIC 215, D Bron, E Sariban, C Devalck, A Ferster (49 (59) 26/23)
Brussels, Clinique universitaire St Luc (hem, ads), CIC 234, A Ferrant (42 (44) 19/23)
Brussels, Clinique Universitaire St Luc (ads), CIC 234, C Vermolen (13 (14) 9/4)
Brussels, Hôpital Erasme (hem), CIC 596, W Feremans, A Kentsos, M Lambermont, A Deweerde (21 (23) 0/21)
Brussels, Ac Z VUC University Hospital (hem, onco), CIC 630, B Van Camp, A Schots (27 (30) 12/15)

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Tartu, University Hospital (hem, onco), CIC 746, H Everaus, A Kaare (19 (19) 9/10)

Finland (7 teams) (255 (274) 90/165)
Helsinki, Children’s Hospital, CIC 219, U Pihkala, S Vettenrantta (31 (37) 21/10)
Helsinki, University Central Hospital, Department of Medicine, CIC 515, L Volin (82 (83) 50/32)
Helsinki, University Hospital (onco), CIC 833, H Joensuu, R Jannes (10 (10) 0/10)

Kuopio, Department of Medicine, CIC 396, E Jantunen, T Nousiainen (33 (33) 0/33)
Oulu, University Central Hospital (hem, onco), CIC 690, P Koistinen, T Turpeenniemi-Hujanen (18 (21) 0/18)
Tampere, University Hospital (ads, peds), CIC 635, E Koivunen, T Lehtinen, R Silvennoinen, M Arola (31 (35) 0/31)
Turku, University Central Hospital, CIC 225, K Remes (50 (55) 19/31)

France (72 teams) (3727 (4173) 1307/2420)
Amiens, CHU d’Amiens, CIC 955, G Damaj (58 (58) 0/58)
Angers, Centre Hospitalier, CIC 650, N Ibrahimi, S Francois (63 (84) 27/36)
Argenteuil, Hopital Victoroudoupy (hem), CIC 199, L Sutton (18 (18) 0/18)
Besançon, Hôpital Jean Minjoz & Hôpital St Jacques (ads, peds), CIC 233, P Herve, E Deconinck, P Rohrich (86 (108) 45/41)
Bordeaux, CHU Bordeaux Groupe Hospitalier Pellegrin-Enfants (peds, hem, onco), CIC 978, C Jubert (12 (14) 5/7)
Brest, CHU de Brest, Hôpital Morvan (Hem), D Gillet (70 (77) 30/40)
Caen, Centre Hospitalier Régional, CIC 251, O Reman (58 (60) 22/36)
Caen, Hôpital Cote de Nacre (peds hem onco), P Boutaud (2 (2) 0/2)
Caen, Centre Régional Francois Baclesse, CIC 305 (35) 0/30
Clermont Ferrand, Centre Jean Perrin and CHU Hotel Dieu (ads, peds), CIC 273, J-O Bay, F Demeoq, P Travade (146 (167) 57/89)
Colmar, Hôpital civil, B Audhuy (5 (5) 0/5)
Corbière Estouje, Hôpital Gilles de Corbière, A Devidas (20 (21) 0/20)
Crest, Hôpital H Mondor (hem), CIC 252, C Cordonnier, M Kuentz (54 (62) 27/27)
Dijon, Hôpital d'Enfants, D Caillot (76 (79) 7/66)
Dunkerque, Centre Hospitalier (hem), M Wetterwald (12 (16) 0/12)
Grenoble, Centre Hospitalier A Michallon (ads, peds), CIC 270, J Y Cahn, F Garban, P Drillot, D Plantaz (82 (93) 35/47)
Lille, Hôpital Claude Huriez, CIC 277, F Bauters, JP Jouet (107 (117) 67/40)
Lille, Hôpital Jeanne de Flandre (peds), CIC 963, B Bruno (1 (1) 0/1)
Lille, Centre Oscar Lambret (onco, peds), A Defacheles (11 (16) 0/11)
Lille, Centre Hospitalier Saint Vincent, N Cambier (16 (17) 0/16)
Limoges, Centre Hospitalier Dupuytren (ads, hem), CIC 977, D Bordesoule, P Turlure (52 (53) 0/52)
Lyon, Hôpital Edouard Herriot, CIC 671, M Michallet, E Wattel, A Thiebaut, F Nicolini, J Troncy, X Thomas (65 (73) 57/8)
Lyon Sud (Pierre Benite), Centre Hospitalier, B Coiffier (87 (96) 0/87)
Lyon, Hôpital Debrousse, CIC 806, Y Bertrand, V Mialou (26 (27) 26/0)
Marseille, Inst. Paoli-Calmettes, CIC 230, D Blaise (255 (311) 67/188)
Marseille, Hôpital d’Enfants de la Timone (onco), CIC 301, C Coze, JL Bernard J Fray (8 (13) 0/8)
Meaux, Centre Hospitalier de Meaux (9 (10) 0/9)
Metz, Thionville Hôpital Notre-Dame de Bon-Secours (hem), V Dorvaux, B Christen (20 (20) 0/19)
Montpellier, CHR Lapeyronie (hem ads), CIC 926, J Rossi, N Pegoeduax (125 (132) 52/73)
Montpellier, Hôpital Arnaud de Villeneuve (peds), G Margueritte (10 (10) 8/2)
Mulhouse, Hôpital du Hasenrain, B Drenou, M Ojeda (13 (13) 0/13)
Nancy, Vandoeuver-les-Nancy, Hôpital d’Enfants, P Bordignon (62 (64) 51/11)
Nancy, Vandoeuver-les-Nancy, CHU Nancy-Brabois (hem), P Lederlin, F Witz (40 (43) 0/40)
Gütersloh, Städt. Krankenhaus (hem, onco), G Massenkeil, B Rußmann (0 (0) 0/0)
Hagen, Kath. Krankenhaus (hem, onco), CIC 536, H Eimermacher, W Lindemann (23 (25) 0/23)
Halle, Martin Luther Universität (hem, onco, ads), CIC 338, G Behre, HJ Sjocholl (191) 21/40
Halle, Martin Luther Universität (hem, onco, peds), CIC 153, D Körholz, C Manz-Körholz (5 (7) 4/1)
Hamburg, Asklepios Klinik St George (hem, onco), CIC 154, N Schmitz, M Zeis (95 (112) 55/40)
Hamburg, AK Altona (hem, onco), CIC 366, D Braumann, H Salwender (38 (75) 0/0)
Hamburg, Universitätsklinikum- Hamburg- Eppendorf (hem, onco, ads), Med Klin II, CIC 673, C Bokemeyer (33 (52) 0/33)
Hameln, Gesundheitseinrichtungen Hameln-Pyrmont, (hem, onco), H Schmidt, K Buhrmann (18 (27) 3/15)
Hamm, St Marien Hospital (hem, onco), CIC 147, H Dürk, D Metzner (17 (26) 0/17)
Hamm, Evangelisches Krankenhaus (hem, onco), CIC 509, L Balleisen, E Lange (21 (24) 0/21)
Hannover, Medizinische Hochschule (hem, onco, ads), CIC 295, A Ganser, M Eder (110 (133) 72/38)
Hannover, Universitätsklinikum Hannover (hem, onco, peds), CIC 342, H Kirchner, M Sosada (12 (19) 0/12)
Heidelberg, Universitätsklinikum, (hem, onco), CIC 524, P Dreger, AD Ho (220 (296) 86/134)
Homburg/Saar, Universitätsklinikum (hem, onco), CIC 785, P Pfreundschuh, J Schubert (54 (72) 18/36)
Idar-Oberstein, Klinik für KMT, Hämato-/Onkologie, CIC 592, A Fauser, H Biersack, Dr Wenzel, L Kraut (16 (22) 13/3)
Karlsruhe, Städtisches Klinikum (hem, onco), CIC 290, M Bentz, St Mahlmann (8 (8) 0/8)
Kaiserslautern, Westpfalzklinikum (hem, onco), CIC 357, H Link, St Mahmann (8 (8) 0/8)
Kiel, Universitätsklinikum (hem, onco), CIC 290, M Bentz, S Wilhelm (26 (37) 0/26)
Kassel, Klinikum Kassel (hem, onco), M Wolf, F E Steinhauser (19 (24) 0/19)
Köln, Universitätsklinikum (ads, peds), CIC 196, P G Schlegel (15 (22) 9/6)
Köln, Klinikum Kölner Biedenkopf GmbH, (he, onco), CIC 625, M Hentrich, L Lutz (17 (27) 0/17)
Köln, Städt. Krankenhaus Schwabing (hem, onco, ads), CIC 189, S Burdach, A Wawer (6 (6) 3/3)
Köln, Universitätsklinikum der LMU, M Reincke, F Oduncu (20 (30) 0/30)
Köln, SKH München-Schwabing (hem, onco), Ch Nef, H Fischer (22 (30) 0/22)
Köln, Universitätsklinikum rechts der Isar (hem, onco), CIC 558, C Peschel, H Menzel (71 (80) 18/53)
Köln, Westfälische Wilhelms-Universität (hem, onco), Innere Medizin, CIC 680, W Berdel, K Jenaist (134 (162) 82/52)
Köln, Universitätsklinikum Oldenburg (hem, onco), CIC 749, B Metzner, H Kolße (67 (97) 12/28)
Köln, Osnabrück, Klinikum Osnabrück (hem, onco), CIC 101, R Peency, HJ Hartlapp (8 (10) 0/8)
Potsdam, Klinikum Ernst-von-Bergmann (hem, onco), CIC 106, G Maschmeyer, A Dakut, (19 (27) 0/19)
Köln, Regensburg, Universität Regensburg (hem, onco), CIC 787, R Andreessen, E Holler, A Reichle (119 (153) 62/57)
Köln, Rothenburg Westfalen, Diakoniekrankenhaus, J Potratz, F Heits, A Meinhardt (18 (22) 0/18)
Köln, Siegen, St Marien- Krankenhaus (hem, onco), CIC 135, W Gassmann, M Kaufmann (48 (61) 21/27)
Köln, Stuttgart, Robert-Bosch-Krankenhaus (hem, onco), CIC 145, W Alutitzky, S Martin, M Kaufmann (48 (61) 21/27)
Köln, Stuttgart, Bürgerhospital und Katharinenhospital (hem, onco), H G Mergenthaler, J Schiecher (18 (27) 0/18)
Köln, Stuttgart, Diakonie-Klinikum, E Heidemann (21 (31) 0/21)
Köln, Tübingen, Eberhard- Karls- Universität Med. u. Poliklinik, (hem, onco), CIC 223, L Kanz, C Faul (114 (142) 68/46)
Köln, Universität, Universität, Klinik für Kinderheilkunde u. Jugendmedizin, (hem, onco), Abteilung Pädiatrie, CIC 535, R Handgretinger, P Lang (26 (43) 33/33)
Köln, Villingen, Schwäbisch-Baar Krankenhaus, Innere Medizin II. 6, W Brugger, F Köhler (23 (27) 0/23)
Köln, Wiesbaden, Deutsche Klinik für Diagnostik, CIC 311, R Schwerdtfeger, M Schleuning, H Baumann (90 (101) 79/11)
Köln, Wiesbaden, Dr Horst-Schmidt Klinikum (hem, onco), CIC 586, N Frichkofen, B Jung (10 (15) 0/10)
Köln, Wuppertal, HELIOS Klinikum Wuppertal, Med. Klinik I. (hem, onco), A Raghavachar (0 (0) 0/0)
Köln, Würzburg, Universitätsklinikum Würzburg, Kinderklinik u. Poliklinik (peds), CIC 196, P G Schlegel (15 (22) 9/6)
Köln, Athens, School of Medicine, (hem, onco), A Ragavachar (0 (0) 0/0)
Köln, Athens, Athens University, CIC 681, G Bourikas, D Pantelidou (4 (4) 0/4)
Köln, Athens, Laikon General Hospital, CIC 328, Y Rombos, D Boutsis, V Kalotychou (no report)
Köln, Athens, University Center, (hem, onco), CIC 603, A Pigadito (1 (1) 0/1)
Köln, Athens, University of Athens, CIC 604, D Keravnoula (15 (15) 2/15)
Athens, Evangelismos Hospital (hem), CIC 622, D Karakasis, N Harhalakis, E Nikiforakis (65 (71) 40/25)

Athens, General Hospital G Gennimatas (hem), CIC 638, A Zomas (no report)

Athens, Attikon Hospital Diagnosis & Therapy Centre ‘Hygeia’ (hem), Maroussi, CIC 643, G Karaiskakis (11 (11) 0/11)

Athens, Hellenic Cancer Institute St Savas (onco), CIC 751, A Efremidis, G Koumakis, M Stamatellou, K Papasavvastou, I Fillis (30 (41) 6/24)

Athens, ‘Agia Sofia’ Children’s Hospital, CIC 752, S Graphakos, G Vellasalas (32 (32) 24/8)

Crete, University Hospital Heraklion, CIC 352, M Kalmanti (1 (1) 0/1)

Patras, University Medical School (hem), CIC 281, N C Zoumbos, A Spyridonidis, A Symeondis, M Timiaikou (16 (17) 12/4)

Thessaloniki, The George Papanicolaou General Hospital (hem), CIC 561, AS Fassas (70 (70) 32/38)

Hungary (5 teams) 306 (306) 90/216

Budapest, St Istvan & St Laszlo Hospital of Budapest (hem ads), CIC 556, T Masszi, P Remenyi (153 (153) 55/98)

Budapest, Szent Laszlo Hospital (ads), CIC 824, G Kriván, E Torvbágyi, L Lengyel (38 (38) 21/17)

Debrecen, University of Debrecen, CIC 648, A Kiss (48 (48) 0/48)

Miskolc, Postgraduate Medical School (ads), CIC 599, N Kalman, G Marton (23 (23) 14/9)

 Pécs, University of Pécs, Internal Medicine, CIC 682, H Llosonczy, M Dávid, A Szomor (44 (44) 0/44)

Iceland (1 team) (17 (17) 0/17)

Reykjavik, National University Hospital (hem), CIC 605, S Reykdal (643 (643) 63/94)

Ireland (5 teams) 157 (157) 63/94

Cork, Regional University Hospital (hem), O Gilligan, M Cahill (7 (7) 0/7)

Dublin, St James’s Hospital (hem), CIC 257, C Flynn, P Browne (101 (113) 50/51)

Dublin, St Vincent’s Hospital (onco), CIC 541, J Crown, K Murphy, M Connell (12 (12) 0/12)

Dublin, Our Lady’s Hospital of Sick Children, Crumlin, CIC 774, A O’Meara (24 (28) 13/11)

Galway, University College Hospital, CIC 408, P Hayden (13 (13) 0/13)

Israel (8 teams) 571 (602) 332/239

Haifa, Rambam Medical Center (hem, ads, peds), CIC 345, J Rowe (98 (100) 49/49)

Jerusalem, Hadassah University Hospital (ads, peds), CIC 258, R Or, S Slavin (108 (110) 80/28)

Petal-Tikva, Beilinson Hospital (hem, ads) CIC 409, M Yeshurun (153 (153) 55/98)

Petal-Tikva, Children’s Medical Center, CIC 755, J Stein (36 (40) 21/15)

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

Tel Aviv, Sourasky Medical Center, CIC 161, E Naparstek (49 (53) 28/21)

Tel Hashomer, Chaim Sheba Medical Center (hem, onco, ads) CIC 754, A Nagler, A Shimoni (184 (196) 117/67)

Tel Hashomer, Chaim Sheba Medical Center (hem, onco, ads) CIC 572, A Toren, H Golan, B Bielorai (41 (47) 22/19)

Italy (97 teams) 3791 (4538) 1340/2451

Alessandria, SS Antonio e Biagio e C Arrigo (hem), CIC 284, A Levis (112 (129) 39/73)

Genova, University of Genova, CIC 139, F Patrone, A Baccicito (27 (32) 0/27)

Genova, Ospedale San Martino (hem), CIC 217, A Bacigalupo (84 (93) 76/8)

Genova, Istituto Giannina Gaslini (hem, onco), CIC 274, G Dini, E Lanino (50 (61) 29/21)

Genova, Ospedaliera Universitaria San Martino (hem), CIC 987, A Carella (29 (34) 5/24)

Latina, Ospedale Santa Maria Goretti, CIC 379, A De Blasio, E Zappone (18 (24) 0/18)

Lecce, Policlinico Universitario (onco), CIC 669, V Pizzino (9 (13) 0/9)

Milano, Ospedale di Niguarda (onco ST), CIC 184, S Siena, P Pedrazzoli, R Sica (35 (62) 0/35)

Milano, Istituto Nazionale Tumori (onco), CIC 616, A Santoro (53 (74) 14/39)

Milano, 1st Clinico Humanitas (hem-onco), CIC 354, L Castagna (112 (129) 39/73)

Milano, Ospedale San Gerardo (onco, ads, peds), CIC 288, A Santoro (53 (74) 14/39)

Milano, Istituto Nazionale Tumori (onco), CIC 616, A Santoro (53 (74) 14/39)

Milano, 1st Clinico Humanitas (hem-onco), CIC 354, L Castagna, A Santoro (53 (74) 14/39)

Milano, Istituto Nazionale Tumori (onco), CIC 616, A Santoro (53 (74) 14/39)

Milano, 1st Clinico Humanitas (hem-onco), CIC 354, L Castagna, A Santoro (53 (74) 14/39)
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<tr>
<th>Location</th>
<th>Institution</th>
<th>Contact Person(s)</th>
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<td>Roma, Cardarelli Hospital (hem)</td>
<td>CIC 607, F Ferrara, S Palmieri</td>
<td>(44 (57) 0/44)</td>
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<td>Napoli, Cardarelli Hospital (hem)</td>
<td>CIC 837, V Mettivier (17 (21) 0/17)</td>
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<td>Napoli, Federico II University (hem)</td>
<td>CIC 766, B Rotoli, C Selleri, L Zanesco, S Varotto (37 (44) 17 (20))</td>
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<td>Napoli, National Cancer Institute (hem, onco)</td>
<td>CIC 839, A Pinto, G Marcacci (25 (36) 0/25)</td>
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<td>Nuoro, Ospedale San Francesco (hem)</td>
<td>CIC 793, A Gabbas, A Palmas (7 (10) 0/7)</td>
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<td>Orbasiano, Ospedale San Luigi Orbasiano (hem)</td>
<td>CIC 378, G Saglio, A Guerrasio (21 (36)1/20)</td>
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<td>Padova, Centro Leucemia Infantili</td>
<td>CIC 285, C Messina, S Cesaro, L Zanesco, S Varotto (37 (44) 17 (20))</td>
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<tr>
<td>Padova, Instituto Oncologia Veneto IVO-IROCSS, Oncologia Medica II</td>
<td>CIC 319, S Aversa, D Marino, A Jirillo, F Canova, C Trentin (6 (6) 0/6)</td>
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<td>Palermo, Ospedale di Bambini (peds,hem,one)</td>
<td>CIC 109, O Ziino (12 (13) 3/9)</td>
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<td>Palermo, Ospedale V Cervello (hem)</td>
<td>CIC 392, R Scimè, A Cavallaro (55 (60) 22 (33)</td>
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<td>Palermo, Ospedale 'La Maddalena' (hem, onco)</td>
<td>CIC 692, M Musso, F Porretto, A Crescimanno (72 (83) 17 (55)</td>
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<td>Parma, Cattedra di Ematologia. Univ. of Parma</td>
<td>CIC 245, V Rizzoli, M Mangoni (13 (18) 1/12)</td>
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<td>Pavia, Policlinico S Matteo (hem)</td>
<td>CIC 286, EP Alessandrini (63 (66) 27/36)</td>
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<td>Pavia, Policlinico St Matteo (hem, onco, peds)</td>
<td>CIC 557, F Locatelli (81 (100) 68/13)</td>
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<td>Pavia, Fondazione S Maugeri (onco)</td>
<td>CIC 771, A Zambelli, G Robustelli della Cuna (8 (14) 0/8)</td>
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<td>Perugia, Policlinico Monteluce (hem)</td>
<td>CIC 573, AM Liberati, G Robustelli (45 (46) 0/45)</td>
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<td>Perugia, Policlinico Monteluce (hem)</td>
<td>Università, CIC 794, MF Martelli, F Aversa, A Tabilio (107 (124) 43/64)</td>
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<td>Pesaro, Ospedale San Salvatore</td>
<td>CIC 529, G Visani, G Lucarelli (40 (43) 14/26)</td>
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<td>Pescara, Ospedale Civile (hem)</td>
<td>CIC 248, P di Bartolomeo (47 (57) 32/15)</td>
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<td>Piacenza, Ospedale Civile (hem, onco)</td>
<td>CIC 163, L Cavaan (23 (26) 0/23)</td>
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<td>Pisa, University of Pisa (peds, hem, onco)</td>
<td>CIC 795, C Favre (18 (21) 16/2)</td>
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<td>Pisa, University of Pisa (ads, hem, onco)</td>
<td>CIC 132, M Petrini, F Papineschi (50 (68) 13/37)</td>
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<td>Potenza, San Carlo Hospital</td>
<td>CIC 861, A Olivier, M Cimminiello (18 (20) 4/14)</td>
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<td>Ravenna, Ospedale Civile (hem, onco)</td>
<td>CIC 306, E Ruffa (25 (31) 0/25)</td>
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<tr>
<td>Reggio Emilia, Policlinico Monteluce (onco)</td>
<td>CIC 305, F Fagioli, F Locatelli (64 (70) 38/26)</td>
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<td>Rimini, Ospedale di Bambini (hem, onco)</td>
<td>CIC 796, A Donfrancesco, A Jenkner, A Castellano, L De Sio, R Cozza, P Fidani, C De Laurentis (21 (25) 0/21)</td>
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<tr>
<td>San Giovanni Rotondo, Hospital Casa Sollevio Sofferenza (hem)</td>
<td>CIC 526, N Cascavilla, M Corsetti, M Greco (63 (79) 18/45)</td>
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<td>Sassari, Universita Di Sassari (hem)</td>
<td>CIC 870, M Longinotti (12 (12) 0/12)</td>
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</table>

**EBMT activity survey 2008**

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Napoli, Cardarelli Hospital (hem), CIC 607, F Ferrara, S Palmieri (44 (57) 0/44)
Napoli, Cardarelli Hospital (hem), CIC 837, V Mettivier (17 (21) 0/17)
Napoli, Federico II University (hem), CIC 766, B Rotoli, C Selleri, L Zanesco, S Varotto (37 (44) 17 (20))
Napoli, National Cancer Institute (hem, onco), CIC 839, A Pinto, G Marcacci (25 (36) 0/25)
 Nuoro, Ospedale San Francesco (hem), CIC 793, A Gabbas, A Palmas (7 (10) 0/7)
 Orbasiano, Ospedale San Luigi Orbasiano (hem), CIC 378, G Saglio, A Guerrasio (21 (36)1/20)
 Padova, Centro Leucemia Infantili, CIC 285, C Messina, S Cesaro, L Zanesco, S Varotto (37 (44) 17 (20))
 Padova, Instituto Oncologia Veneto IVO-IROCSS, Oncologia Medica II, CIC 319, S Aversa, D Marino, A Jirillo, F Canova, C T Trentin (6 (6) 0/6)
 Palermo, Ospedale di Bambini (peds,hem,one), CIC 109, O Ziino (12 (13) 3/9)
 Palermo, Ospedale V Cervello (hem), CIC 392, R Scimè, A Cavallaro (55 (60) 22 (33))
 Palermo, Ospedale ‘La Maddalena’ (hem, onco), CIC 692, M Musso, F Porretto, A Crescimanno (72 (83) 17 (55))
 Parma, Cattedra di Ematologia, Univ. of Parma, CIC 245, V Rizzoli, M Mangoni (13 (18) 1/12)
 Pavia, Policlinico S Matteo (hem), CIC 286, EP Alessandrini (63 (66) 27/36)
 Pavia, Policlinico St Matteo (hem, onco, peds), CIC 557, F Locatelli (81 (100) 68/13)
 Pavia, Policlinico St Matteo (onco), CIC 562, M Danova (0 (0) 0/0) center under reconstruction.
 Pavia, Fondazione S Maugeri (onco), CIC 771, A Zambelli, G Robustelli della Cuna (8 (14) 0/8)
 Perugia, Policlinico Monteluce (onco), CIC 573, AM Liberati, FGrignani (no report)
 Perugia, Policlinico Monteluce (hem), Università, CIC 794, MF Martelli, F Aversa, A Tabilio (107 (124) 43/64)
 Pesaro, Ospedale San Salvatore, CIC 529, G Visani, G Lucarelli (40 (43) 14/26)
 Pescara, Ospedale Civile (hem), CIC 248, P di Bartolomeo (47 (57) 32/15)
 Piacenza, Ospedale Civile (hem, onco), CIC 163, L Cavaan (23 (26) 0/23)
 Pisa, University of Pisa (peds, hem, onco), CIC 795, C Favre (18 (21) 16/2)
 Pisa, University of Pisa (ads, hem, onco), CIC 132, M Petrini, F Papineschi (50 (68) 13/37)
 Potenza, San Carlo Hospital, CIC 861, A Olivier, M Cimminiello (18 (20) 4/14)
 Ravenna, Ospedale Civile (hem, onco), CIC 306, E Ruffa (25 (31) 0/25)
 Reggio Emilia, Policlinico Monteluce (onco), CIC 305, F Fagioli, F Locatelli (64 (70) 38/26)
 Rimini, Ospedale di Bambini (hem, onco), P Fattori (16 (20) 0/16)
London, Great Ormond Street Hospital, CIC 243, P Veys (62 (70) 48/14)
London, St George’s Hospital (hem), CIC 539, EC Gordon-Smith, S Ball (16 (18) 10/6)
London, Guy’s Hospital (hem), CIC 721, M Kazmi (42 (48) 20/22)
London, King’s College (hem), CIC 763, A Pagliuca (132 (146) 75/57)
London, St Bartholomew’s, CIC 768 and the Royal London Hospital, J Gribben, J Cavenagh, S Agrawal, T Lister (96 (105) 45/51)
London, St Mary’s Hospital, CIC 866, J de La Fuente, JD Cavenagh, S Agrawal, T Lister (17 (19) 17/0)
Manchester, Royal Children’s Hospital, CIC 521, R Wynn (27 (27) 22/5)
Manchester, The Royal Infirmary, CIC 601, JA Yin (55 (57) 33/22)
Manchester, Christie Hospital (hem), CIC 780, E Liakopoulou (90 (100) 27/63)
Newcastle upon Tyne, Royal Victoria Infirmary and the Sunderland Royal Hospital, CIC 276, GH Jackson, SJ Proctor, P Taylor, A Cant, R Skinner PJ Carey (111 (121) 59/52)
Norwich, Norfolk and Norwich Hospital (hem), CIC 391, M Lawes, G Turner (14 (15) 0/14)
Nottingham, City Hospital, CIC 717, N Russell, JL Byrne, AP Haynes, A McMillian (120 (129) 48/72)
Oxford, John Radcliffe Hospital (hem, onco), Headington and Wycombe General, CIC 255, TJ Littlewood, C Buneh, C Mitchell, C Hatton, G Hall, J Wainscoat (75 (80) 27/48)
Plymouth, Derriford Hospital, CIC 823, MD Hamon (39 (45) 10/29)
Salisbury NHS Foundation Trust, CIC 757, J Cullis (4 (4) 0/4)
Salford, Hope Hospital, JB Houghton (4 (4) 0/4)
Sheffield, Sheffield Teaching Hospitals NHS Foundation Trust CIC 778/1, J Snowden, J Rumble, Children’s Hospital NHS Foundation Trust CIC 778/2, A Vora (65 (72) 24/41)
Somerset, Taunton and Somerset Hospital S Bolam, SA Johnson (10 (10) 0/10)
Southampton, CRC Wessex, CIC 704, K Orchard, A Duncombe, J Kohler (74 (79) 25/49)
Stoke-on-Trent, University Hospital of North Staffordshire (hem), CIC 394, R Chasty (12 (14) 0/12)
Swansea, Singleton Hospital, CIC554, Skett, S AI Ismail (7 (7) 0/7)
Swindon, Great Western Hospital (Hem), CIC 608, N E Blesing, A Gray, S Green, A Koster (9 (10) 0/9)

Total: 26 810 (30 293) 10 782/16 028)
* Late report, not included in the analysis
** Late correction, not included in the analysis