

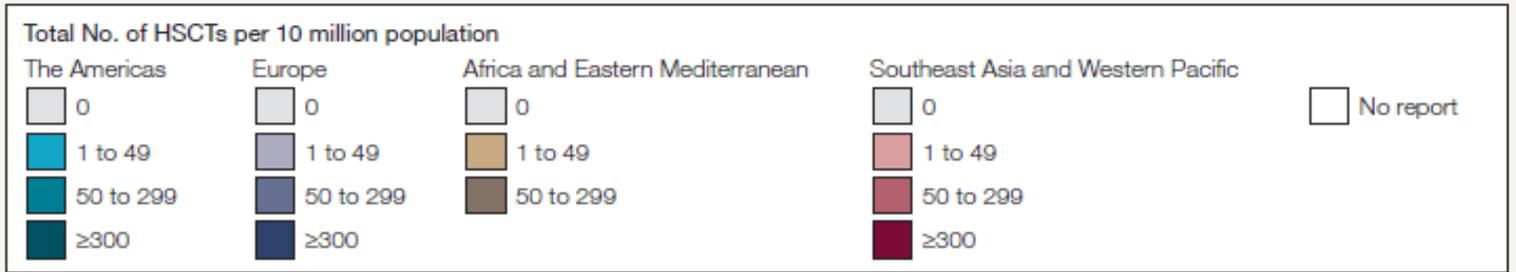
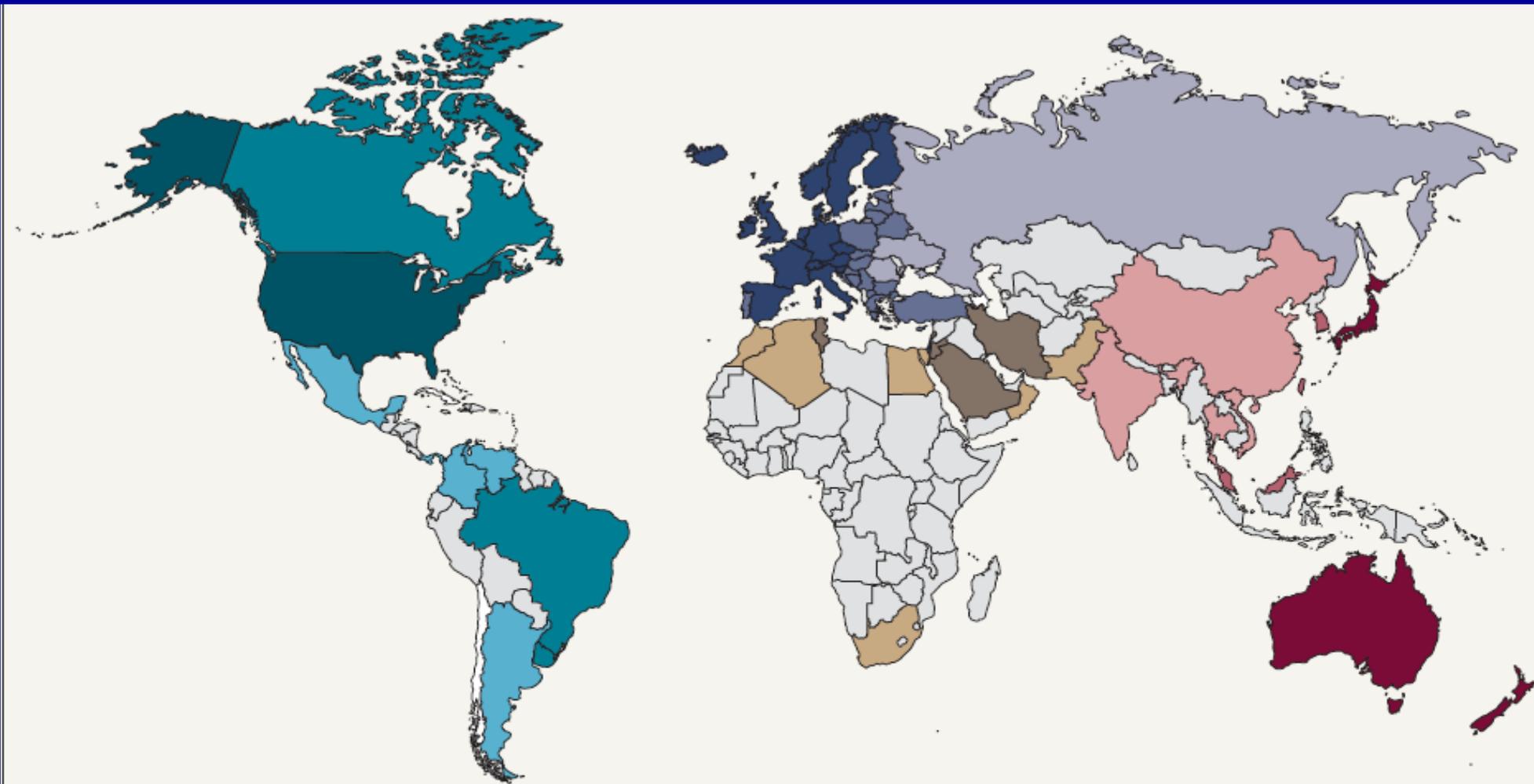
Strategic Priorities for Hematopoietic Transplantation in the EMRO Region

Syed Osman Ahmed

(King Faisal Specialist Hospital and Research Centre, Riyadh Saudi Arabia)

4th WBMT Symposium

15th January 2017



Contrasting nations...The Richest...



1. Qatar \$129,700



13. UAE \$67,700



Saudi Arabia : \$54,100



...The Poorest...



Per Capita:

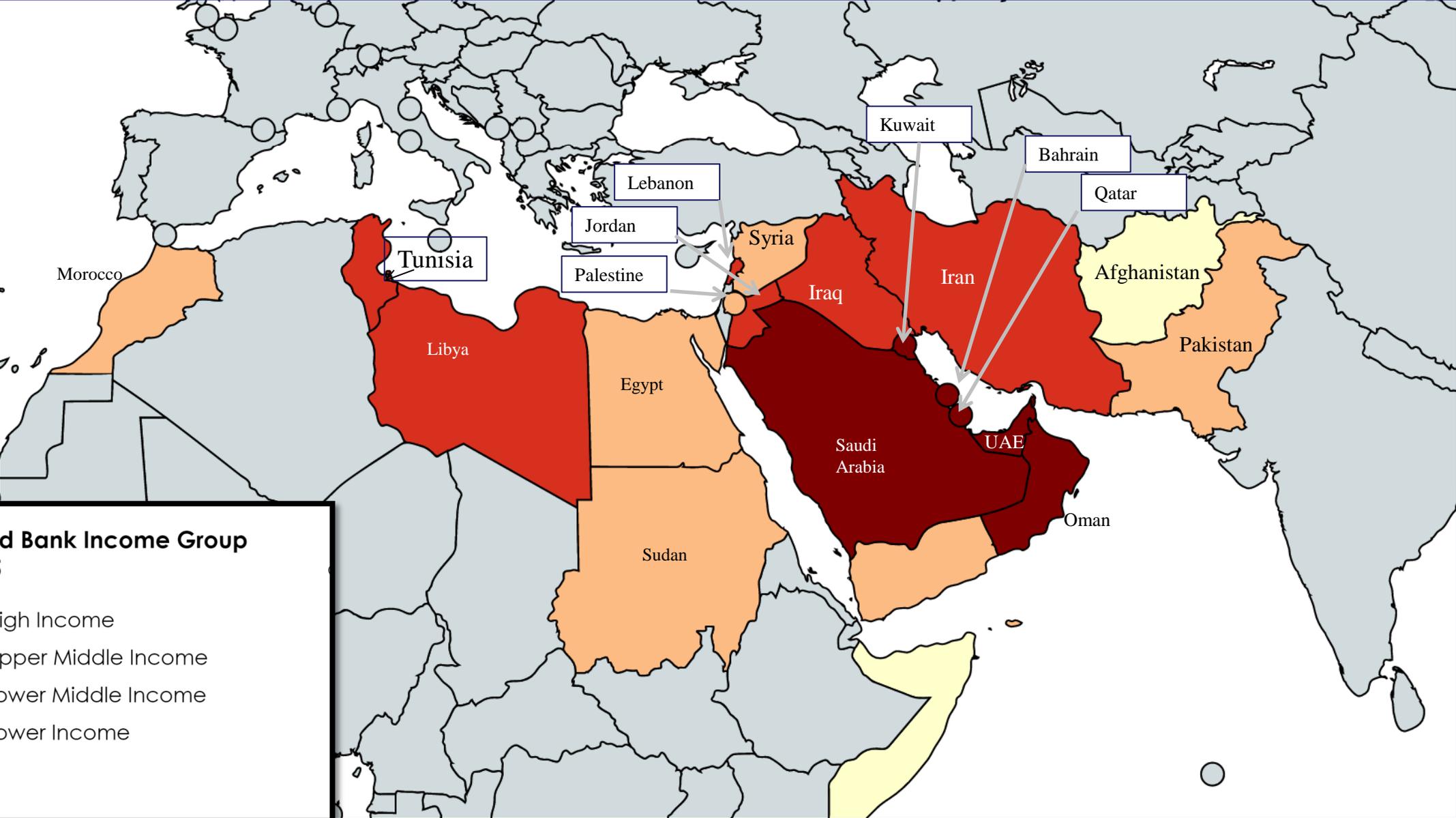
149. Yemen \$ 3900

160. Djibouti \$ 3000

197. Somali \$ 197



EMRO COUNTRIES BY WORLD BANK INCOME



World Bank Country Groups

Country	Population in millions (2013) ^a	Country group	2015 World Bank country income group (9)
Bahrain	1.33	Group 1	High income
Kuwait	3.37	Group 1	High income
Oman	3.63	Group 1	High income
Qatar	2.17	Group 1	High income
Saudi Arabia	28.83	Group 1	High income
United Arab Emirates	9.35	Group 1	High income
Group 1 total	48.68		

World Bank Country Groups

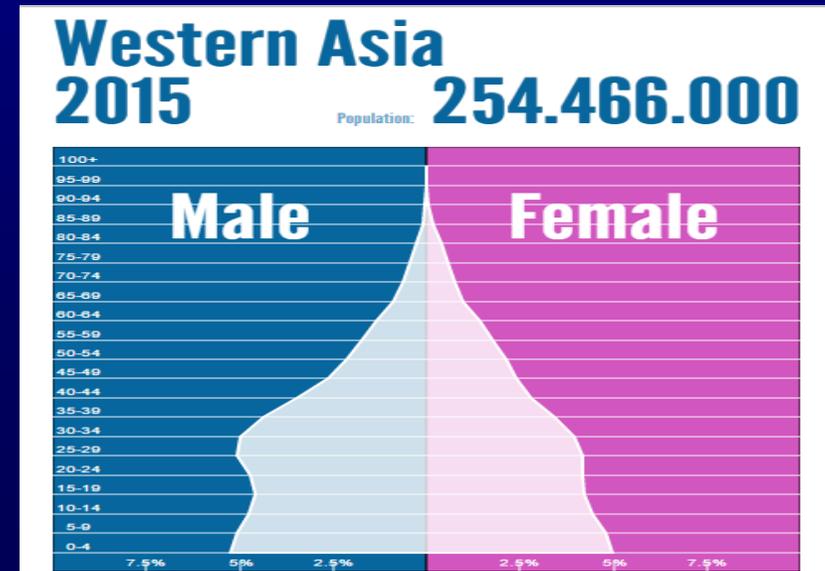
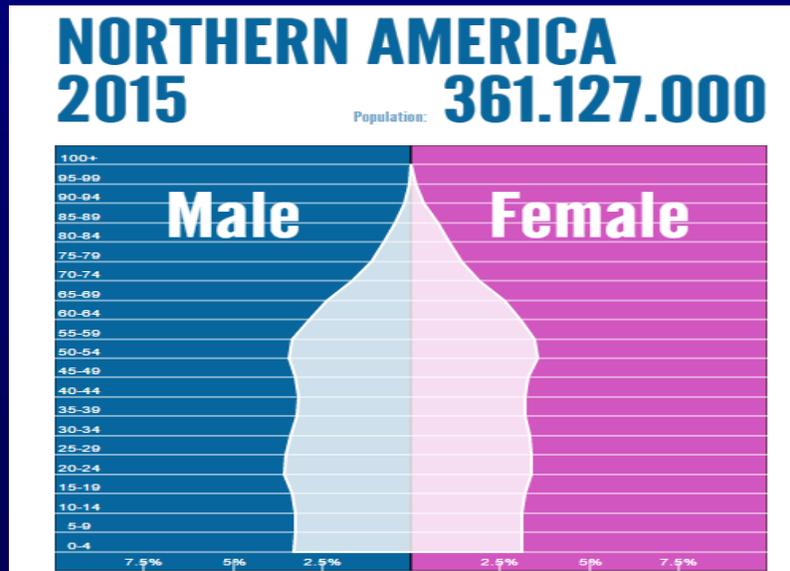
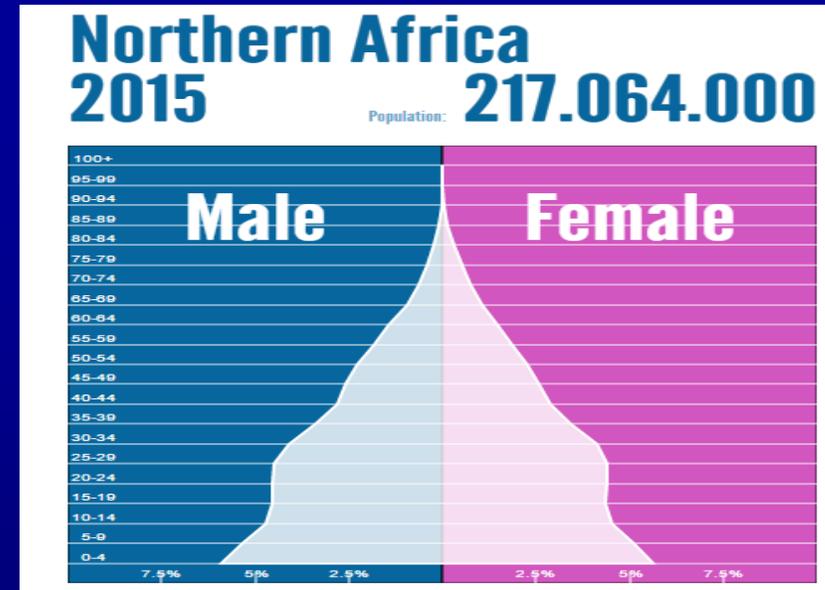
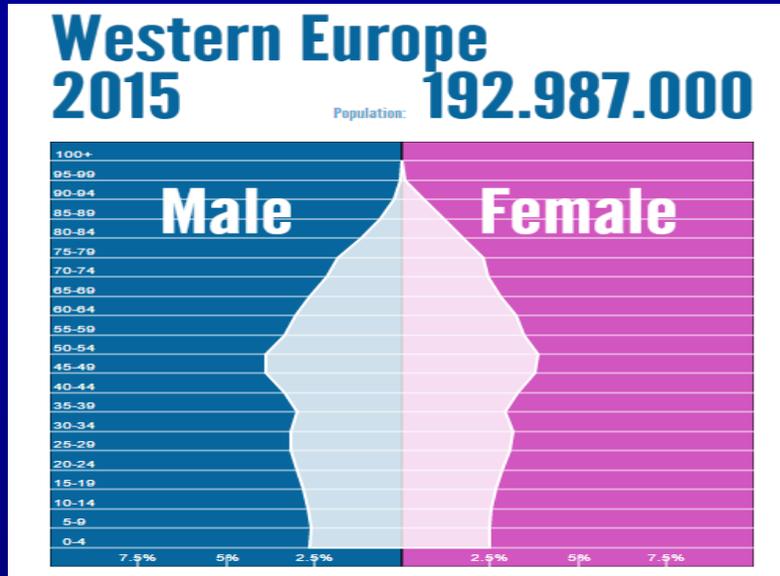
Country	Population in millions (2013)*	Country group	2015 World Bank country income group (9)
Egypt	82.06	Group 2	Lower-middle income
Iran (Islamic Republic of)	77.45	Group 2	Upper-middle income
Iraq	33.77	Group 2	Upper-middle income
Jordan	7.27	Group 2	Upper-middle income
Lebanon	4.82	Group 2	Upper-middle income
Libya	6.20	Group 2	Upper-middle income
Morocco	33.01	Group 2	Lower-middle income
Palestine	4.42 ^b	Group 2	Lower-middle income
Syrian Arab Republic	21.90	Group 2	Lower-middle income
Tunisia	11.00	Group 2	Upper-middle income
Group 2 total	281.89		

World Bank Country Groups

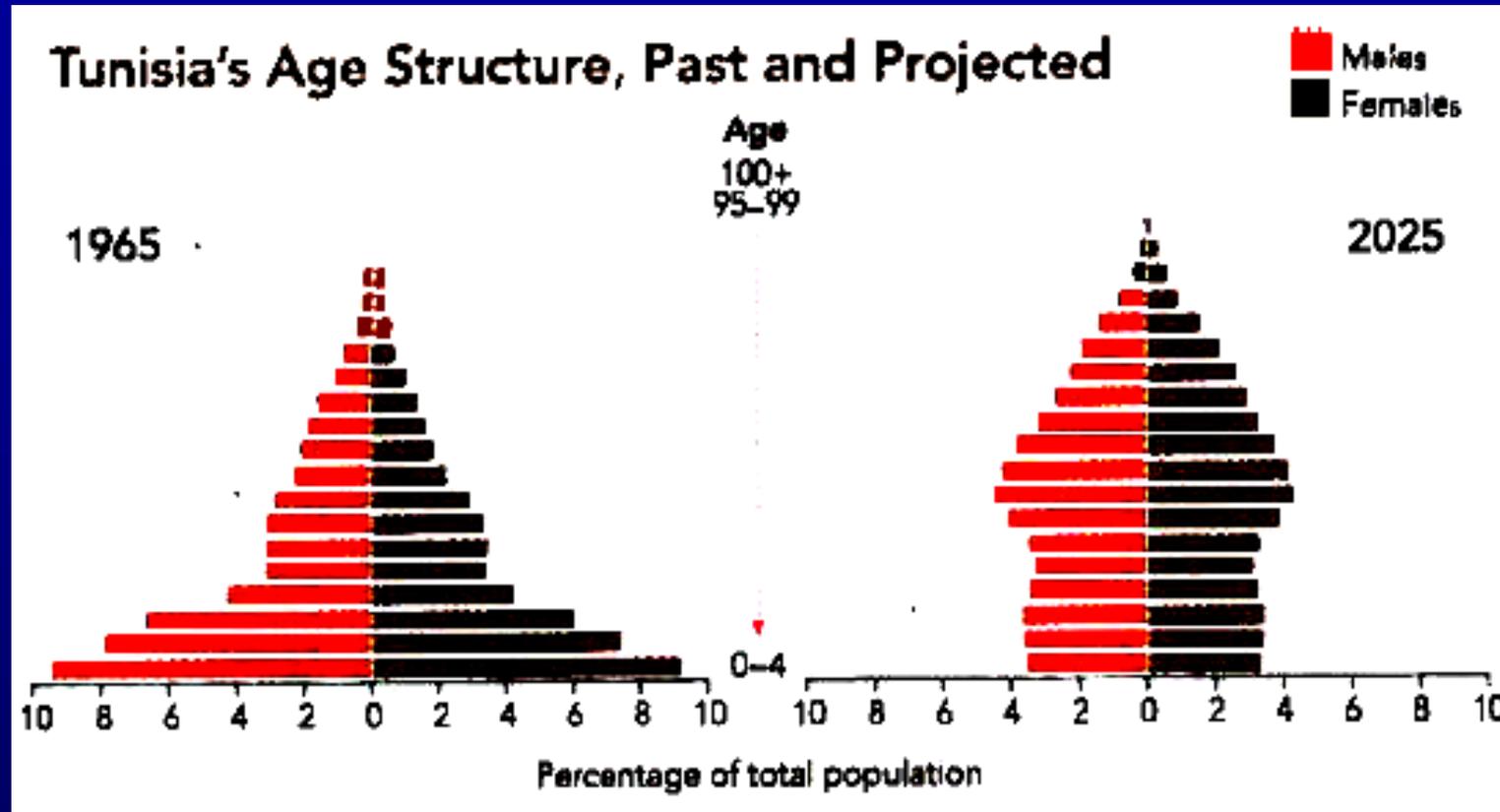
Country	Population in millions (2013) ^a	Country group	2015 World Bank country income group (9)
Afghanistan	30.55	Group 3	Low Income
Djibouti	0.87	Group 3	Lower-middle income
Pakistan	182.14	Group 3	Lower-middle income
Somalia	10.50	Group 3	Low income
Sudan	37.96	Group 3	Lower-middle income
Yemen	24.41	Group 3	Lower-middle income
Group 3 total	286.44		

Demographics of the EMRO region

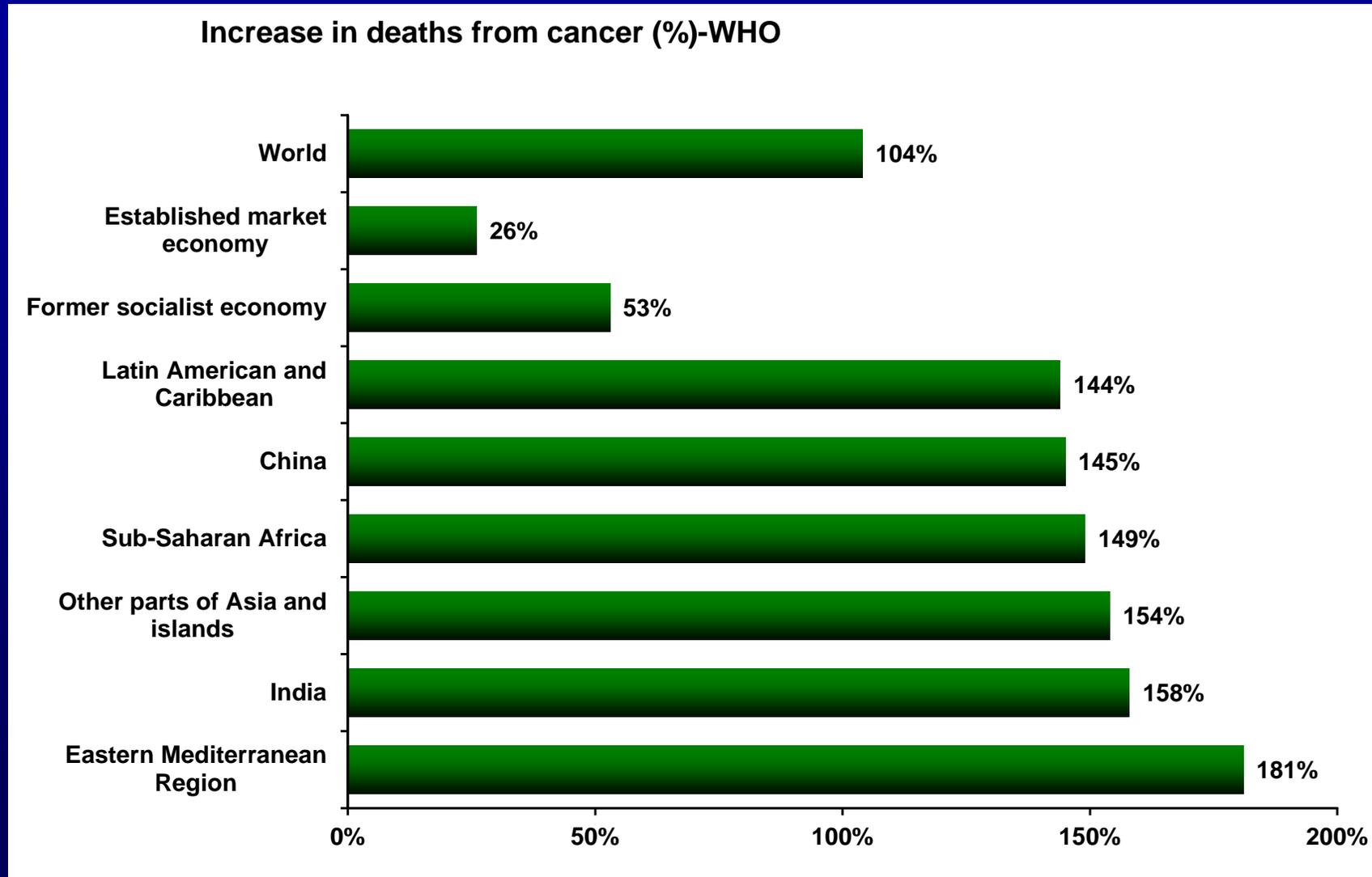
POPULATION STRUCTURE OF EUROPE/N.AMERICA VS “EMRO”



Changing Demographics



Changing Healthcare Needs



Regional framework for action

Noncommunicable diseases

Regional framework for action



In October 2012, the WHO Regional Committee for the Eastern Mediterranean endorsed a regional framework for action. This document is a road map for countries in the Region to implement the United Nations Political Declaration on Prevention and Control of Noncommunicable Diseases.

The regional framework provides strategic interventions and indicators to assess country progress in the areas of:

Governance



Prevention and reduction of risk factors



Surveillance and monitoring



Health care



Regional framework for action

■ Noncommunicable diseases

Regional framework for action

In October 2012, the WHO Regional Committee for the Eastern Mediterranean endorsed a road map for countries in the Region to implement the United Nations Political Declaration on NCDs.

The regional framework provides strategic interventions and indicators to assess countries' progress.

“ Implement the Regional framework for action to reduce deaths from NCDs by 25% by 2025. ”

Governance 	Prevention and reduction of risk factors 	Surveillance and monitoring 	
---	--	--	---



Diseases

Risk factors

WHO's work

Regional framework for action

Surveillance

News

Campaigns

Information resources

» Act now



Cancer is one of the
top four
leading causes of death in the Eastern
Mediterranean Region

Nearly 400 000
people die from cancer annually in our
Region

Beat **cancer**



Adopt healthy behaviours



Be aware of the early signs and symptoms



Seek early diagnosis and treatment

Noncommunicable diseases
Chronic respiratory
cells, which can invade
over 100 types of
they can be either benign
surrounding tissue and is
nearby tissue and



- Issues related to donor availability/genetics
- Issues related to specific diseases
- Pattern of infections
- Socio-economic aspects

Alternative Donor Search algorithms: Non- Sibling Related Donors

Bone Marrow Transplantation (2015) **50**, 545–552
© 2015 Macmillan Publishers Limited All rights reserved 0268-3369/15
www.nature.com/bmt



ORIGINAL ARTICLE

Efficiency of allogeneic hematopoietic SCT from HLA fully-matched non-sibling relatives: A new prospect of exploiting extended family search

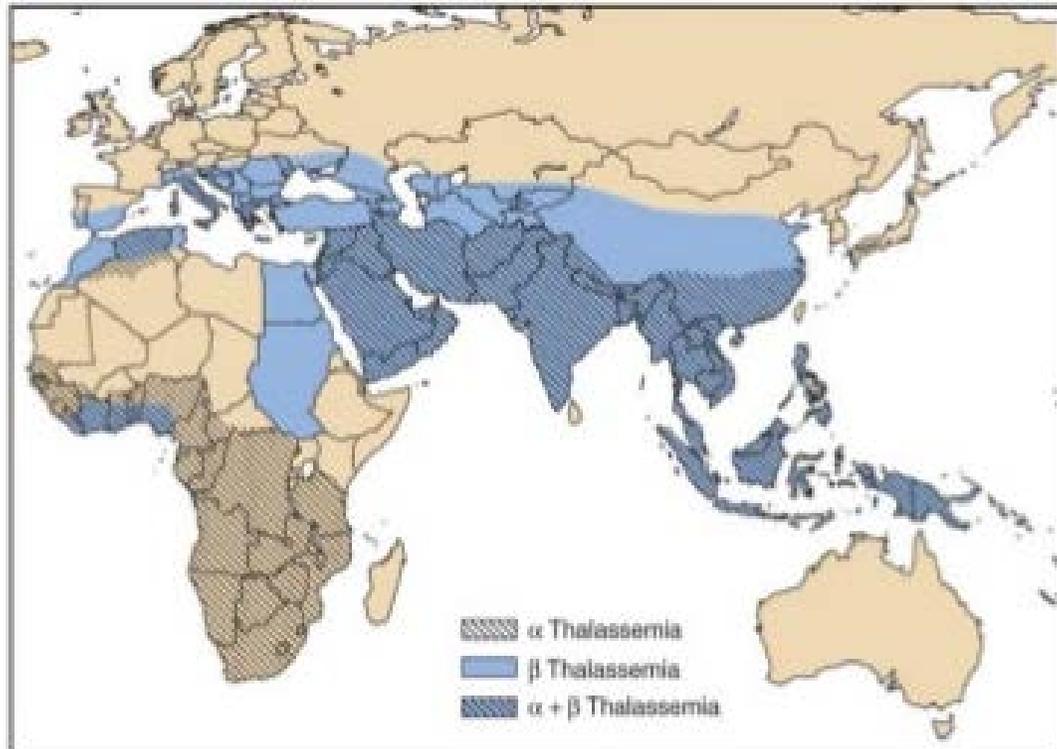
AA Hamidieh, M Ostadali Dehaghi, P Paragomi, S Navaei, A Jalali, G Ghazizadeh Eslami, M Behfar and A Ghavamzadeh

- Upto 30% consanguinity in some EMRO countries
- 109 non sibling matches found in 523 (20%) searches in Iran

Strategic Priorities for HSCT in the EMRO Region

- Issues related to donor availability/genetics
- Issues related to specific diseases
- Pattern of infections
- Socio-economic aspects

World Distribution of Thalassaemias



WHO REGION	Annual Affected Conceptions β - thalassaemia Major
American Region	533
European Region	1347
African Region	1520
Western Pacific	7601
EM Region	9715
South East Asian Region	21693

Hemoglobinopathies

- High prevalence of hemoglobinopathies
- Heavily pre-transfused patients with the consequences of

Iron overload

Viral hepatitis (both B and C)

Organ dysfunction

Estimated reach of treatment for β thalassaemia in each WHO region

WHO region	Estimated annual births β thalassaemias		Transfusion			No. of known patients	Adequate iron chelation		Inadequate or no iron chelation	
	Total	Transfusion-dependent	Annual no. starting transfusion	% of transfusion-dependent patients transfused	Annual deaths because not transfused		% with chelation	No. with chelation	No. of patients	Annual deaths due to iron overload
African	1 386	1 278	35	2.7	1 243	–	–	–	–	–
American	341	255	134	52.4	121	2 750	58	1 604	1 146	57
Eastern Mediter-ranean	9 914	9 053	1 610	17.8	7 443	39 700	27	10 818	28 882	1 444
European	1 019	920	140	15.5	780	16 230	91	14 754	1 476	74
South-east Asian	20 420	9 983	962	9.6	9 021	35 500	19	6 621	28 879	1 444
Western Pacific	7 538	4 022	108	2.7	3 914	3 450	44	1 504	1 946	97
World	40 618	25 511	2 989	11.7	22 522	97 630	39	37 866	59 764	2 988

WHO region	Estimated annual births β thalassaemias		Transfusion			No. of known patients	Adequate iron chelation		Inadequate or no iron chelation	
	Total	Transfusion-	Annual no.	% of	Annual		% with	No. with	No. of	Annual deaths due to iron overload
African	1									–
American										57
Eastern Mediter-ranean	9									1 444
European	1									74
South-east Asian	20									1 444
Western Pacific	7									97
World	40 618	25 511	2 989	11.7	22 522	97 630	39	37 866	59 764	2 988

B-Thalassaemia Major in EMRO Region:

Only 17% of patients who need transfusions actually receive it

>7000 deaths/year due to lack of transfusion

>28,000 patients have inadequate or no chelation

>1400 deaths/year due to iron overload

Severe Aplastic Anemia / Bone Marrow Failure Syndromes

- Frequently heavily pre-transfused (need for adequate Lympho/Immunoablation) to avoid graft rejection
- Late presentation frequently with infection(s)
- Elevated liver enzymes on admission including “Seronegative hepatitis aplasia syndrome”
- Consanguinity – higher likelihood of being inherited form?

Strategic Priorities for HSCT in the EMRO Region

- Issues related to donor availability/genetics
- Issues related to specific diseases
- **Pattern of infections**
- Socio-economic aspects

Infection

- CMV
 - High seropositivity in donors and recipients (greater than 90% in many counties)
- Hepatitis B+C
 - Risk of toxicity
 - Donor selection
- TB

Strategic Priorities for HSCT in the EMRO Region

- Issues related to donor availability/genetics
- Issues related to specific diseases
- Pattern of infections
- Socio-economic aspects

Economic Aspects of Hematopoietic Stem Cell Transplantation in Developing countries

- Centers per Km²
 - 1 team per 10,000km²
- Centers per population
 - 1 team per 2 million
- Single center expansion / access to HSCT center vs too many small centers (additional issue in defining cost/effectiveness of HSCT programs)

TRANSPLANTATION IN THE EMRO REGION

Transplantation Activity in the EMRO Region 1984-2007



Trends of Hematopoietic Stem Cell Transplantation in the Eastern Mediterranean Region, 1984-2007

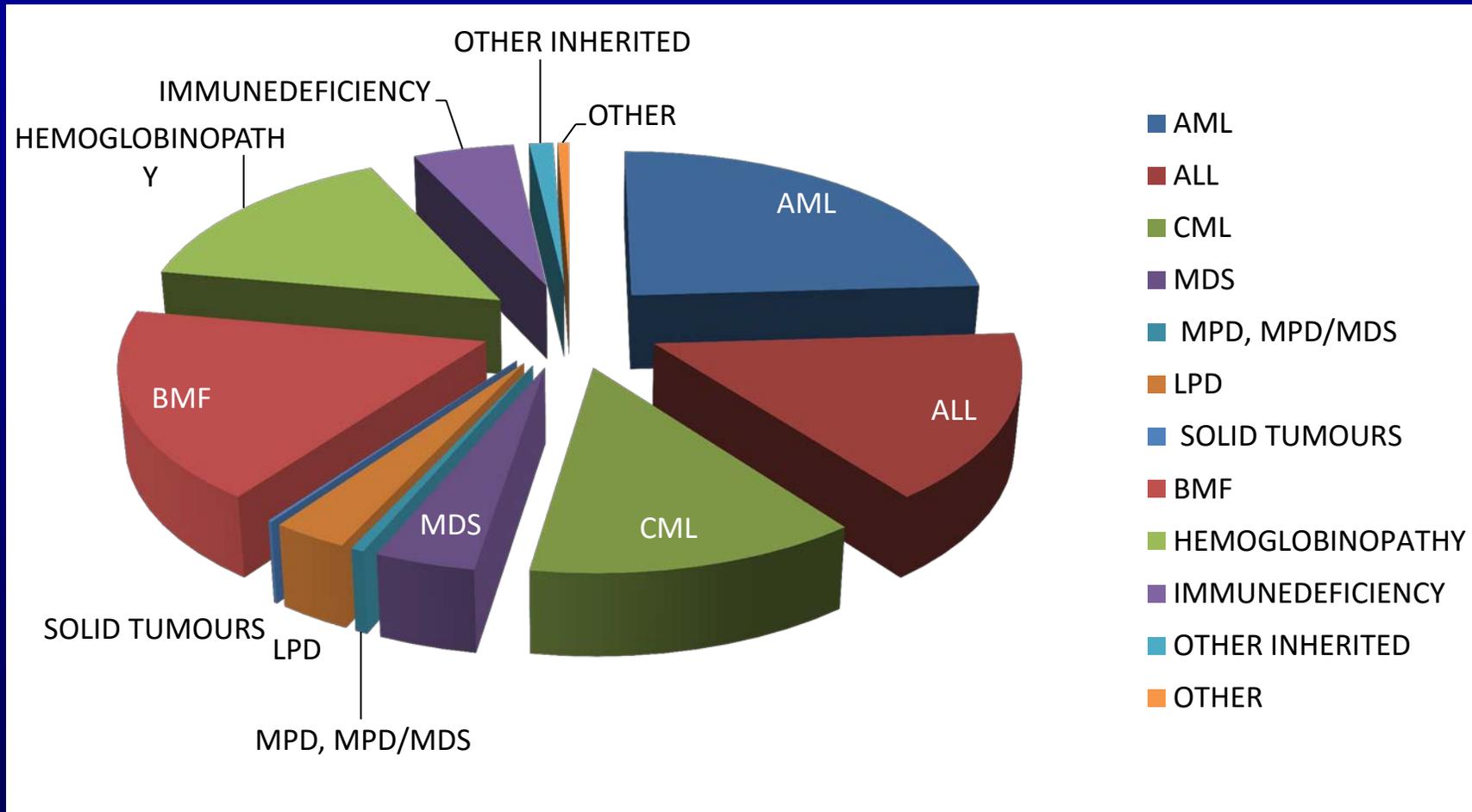
*Syed O. A. Ahmed,¹ Ardeshir Ghavamzadeh,² Syed Z. Zaidi,³ Helen Baldomero,⁴
Marcelo C. Pasquini,⁵ Fazal Hussain,¹ Kamran Alimoghaddam,² Fahad Almohareb,¹
Mouhab Ayas,¹ Amir Hamidieh,² Hossam K. Mahmoud,⁶ Alaa Elhaddad,⁶ Tarek Ben Othman,⁷
Abdelrahman Abdelkefi,⁷ Mahmoud Sarhan,⁸ Fawzi Abdel-Rahman,⁸ Salman Adil,⁹
Salam Alkindi,¹⁰ Ali Bazarbachi,¹¹ Said Benchekroun,¹² Dietger Niederwieser,¹³
Mary Horowitz,⁵ Alois Gratwohl,⁴ Hassan El Solh,¹ Mahmoud Aljurf¹*

Overall Transplant Activity 1984-2010

Country	AUTO	ALLO	TOTAL
Algeria	169	303	472
Egypt	321	1434	1755
Iran	1065	2453	3518
Jordan	244	385	629
KSA	818	2678	3496
Lebanon	256	47	303
Morocco	78	2	80
Oman	17	171	188
Pakistan	61	420	481
Tunisia	458	462	920
	3487	8355	11842

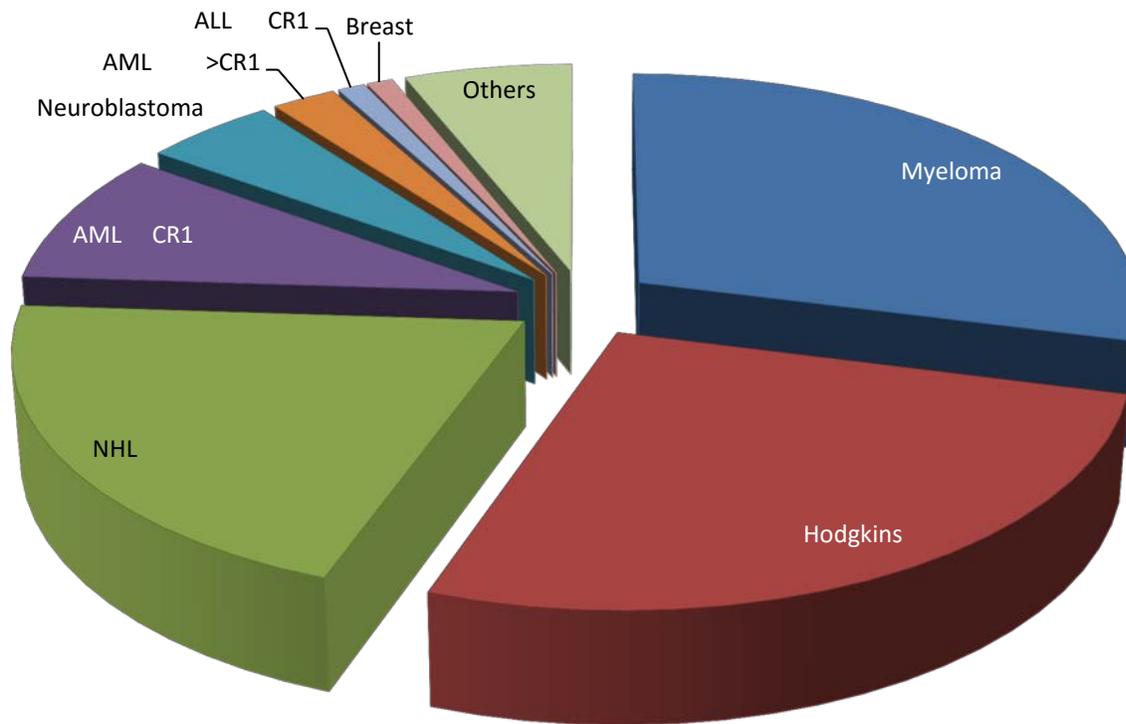
Allo-SCT

Overall Indications 1984-2007



AUTOGRAFTS 1984-2010

-Indications



Indications

- Myeloma 29%
- Hodgkins 27%
- NHL 21%
- AML CR1 9%
- Others 17%

Transplantation Activity in the EMRO Region : HSCT Practices



original research report

Hematopoietic stem cell transplantation practice variation among centers in the Eastern Mediterranean Region (EMRO): Eastern Mediterranean Bone Marrow Transplantation (EMBT) group survey

Walid Rasheed ^{a,*}, Ardeshir Ghavamzadeh ^b, Rosemarie Hamladji ^c, Tarek Ben Othman ^d,
Amal Alseraihy ^a, Fawzi Abdel-Rahman ^e, Alaa Elhaddad ^f, Abdulaziz Alabdulaaly ^g,
David Dennison ^h, Ahmad Ibrahim ⁱ, Ali Bazarbachi ^j, Mohamed-Amine Bekadja ^k,
Said Yousuf Mohamed ^a, Salman Naseem Adil ^l, Parvez Ahmed ^m, Said Benchekroun ⁿ,
Mani Ramzi ^o, Mohammad Jarrar ^p, Kamran Alimoghaddam ^b, Fazal Hussain ^a,
Amir Hamidieh ^b, Mahmoud Aljurf ^a

Transplantation Activity in the EMRO Region 2008-2009



original research report

special report

Hematopoietic Stem Cell Transplantation in the Eastern Mediterranean Region (EMRO) 2008-2009: Report on behalf of the Eastern Mediterranean Bone Marrow Transplantation (EMBMT) Group

Said Yousef Ahmed Mohamed,^a Ibtihal Fadhil,^b Rose-Marie Hamladji,^c Amir Ali Hamidieh,^d Omar Fahmy,^e Saloua Ladeb,^f Kamran Alimoghaddam,^d Alaa Elhaddad,^e Redhouane Ahmed Nacer,^c Fahad Alsharif,^a Walid Rasheed,^a Mohammad Jahani,^d Seyed Asadollah Mousavi,^d Amal Alseraihy,^a Fawzi Abdel-Rahman,^g Abdullah Al Jefri,^a Ayad Ahmed Hussein,^g Abdulaziz Alabdulaaly,^h Ahmad Ibrahim,ⁱ Mohamed-Amine Bekadja,^j Miguel Abboud,^k Parvez Ahmed,^l David Dennison,^m Mohammad Bakr,^a Said Benchekroun,ⁿ Fazal Hussain,^a Tarek Ben Othman,^f Mahmoud Aljurf,^a Ardeshir Ghavamzadeh^d

Transplantation Activity in the EMRO Region 2011-2012



original research report

special report

**Hematopoietic Stem Cell Transplantation in
the Eastern Mediterranean Region
2008-2011: A comprehensive
report on behalf of the Eastern
Mediterranean Blood and Marrow
Transplantation group (EMBMT)**

Said Yousef,
Fahmy,^e Saad
Alsharif,^a Wafiq
Abdel-Rahman,
Mohamed-
Benchekroun,^b

special research report

**Hematopoietic stem cell transplantation
in the Eastern Mediterranean Region
(EMRO) 2011–2012: A comprehensive
report on behalf of the Eastern
Mediterranean Blood and Marrow
Transplantation group (EMBMT)**



Participating Teams

- No of countries with active program: 10
- Active teams : 21

Countries	Teams
(Algeria)	2
Egypt	2 (4)
Iran	3 (4)
Jordan	2
KSA	3 (6)
Lebanon	2
Morocco	1 (3)
Oman	1
Qatar	(1)
Pakistan	3 (4)
Tunisia	2

Survey Form

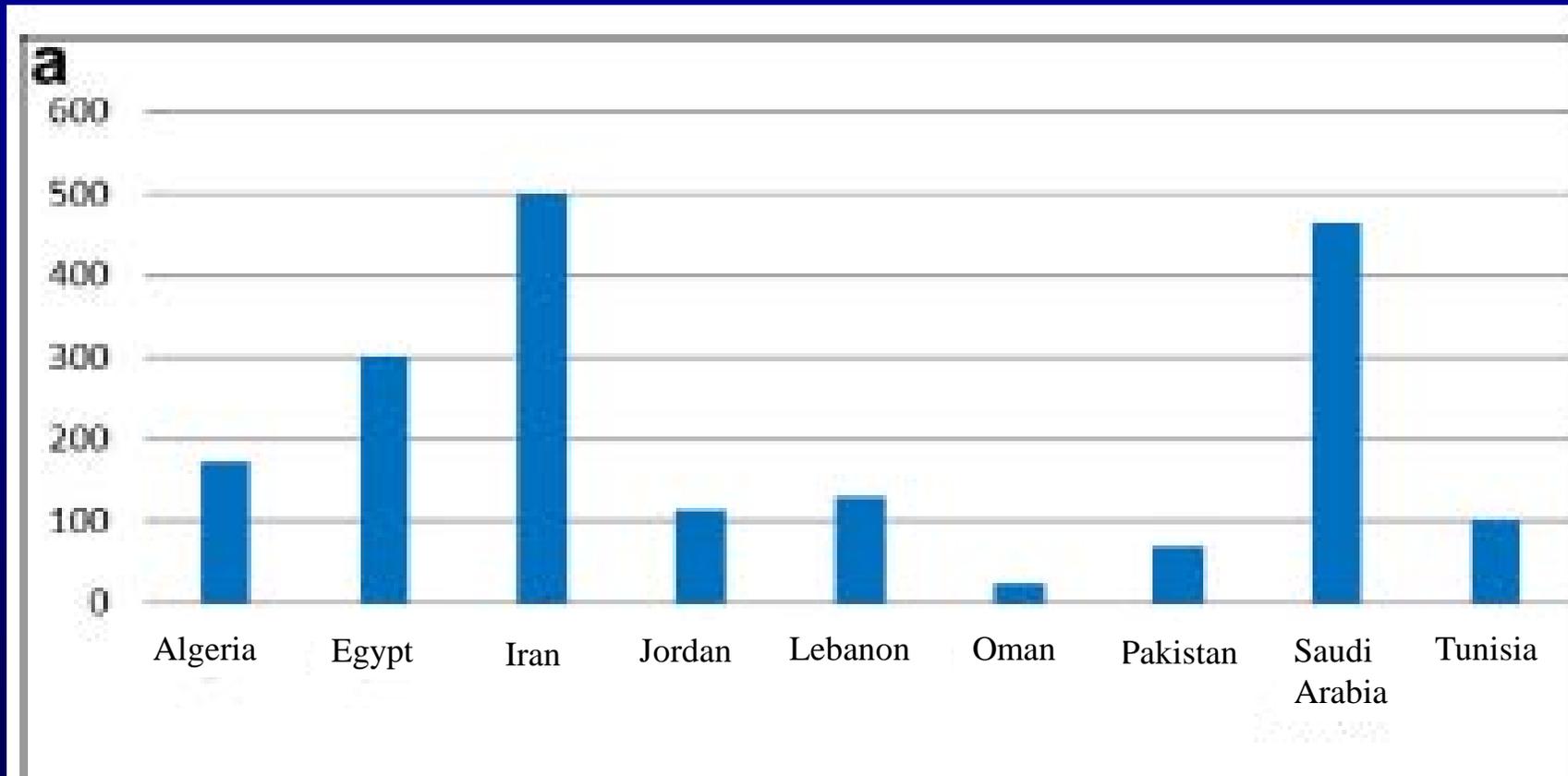
Year: _____

Indication	
AML	CR ₁
	>CR ₁
ALL	CR ₁
	>CR ₁
CML	CP ₁
	>CP ₁
MDS	
MPD	
Myeloma	
Other Plasma Cell Disorders	
NHL	
IHD	
CLL including PLL	
Breast	
Neuroblastoma	
Germ Cell Tumor	
Renal Cell Ca	
Other Solid Tumor	

Indication (contd)	
Aplastic Anemia	
PNH	
Other Acquired BM Failure Syndromes	LAD
Congenital BM Failure Syndromes	WAS
B. Thalassemia	SCID
Sickle Cell	PAID
Other Hemoglobin Disorder	Osteopetrosis
Aplastic Anemia	Inherited Metabolic Disorders
PNH	
Others	Autoimmune
	Others

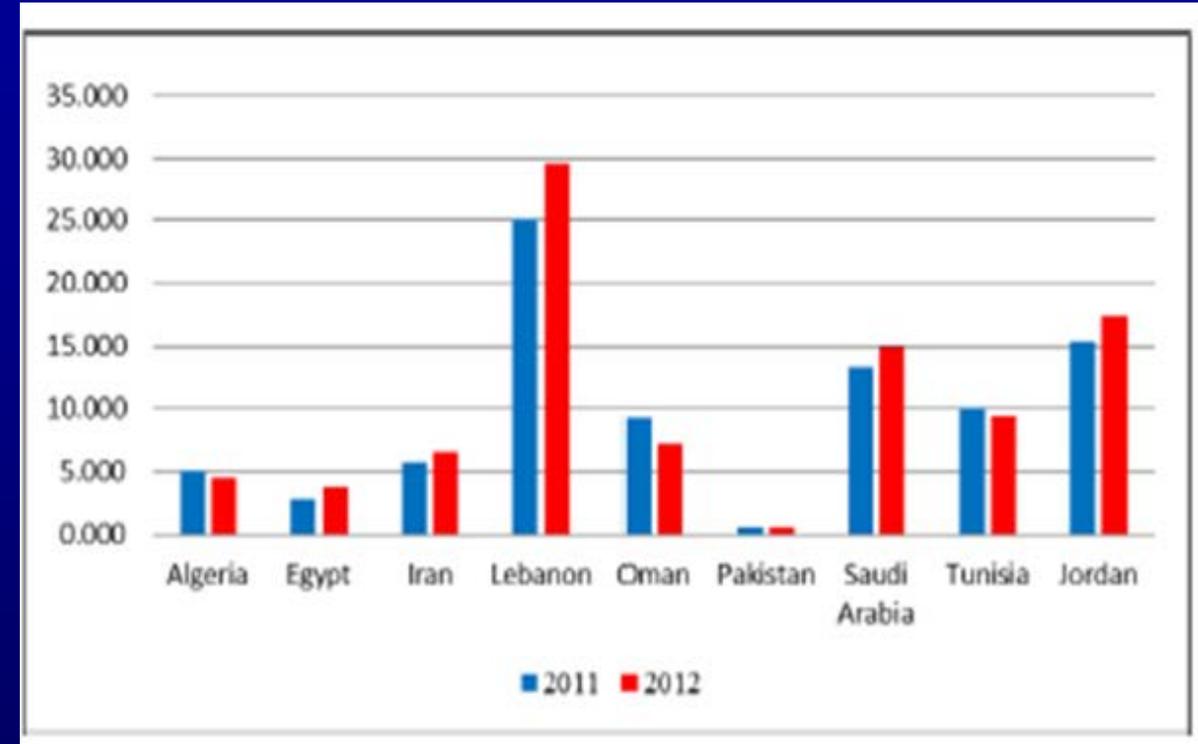
Allogeneic Conditioning	Conventional
	RIC
Allogeneic Stem Cell Source	Related BM
	Related PB
	Cord Blood
	MUD

Transplant Numbers by country for 2012

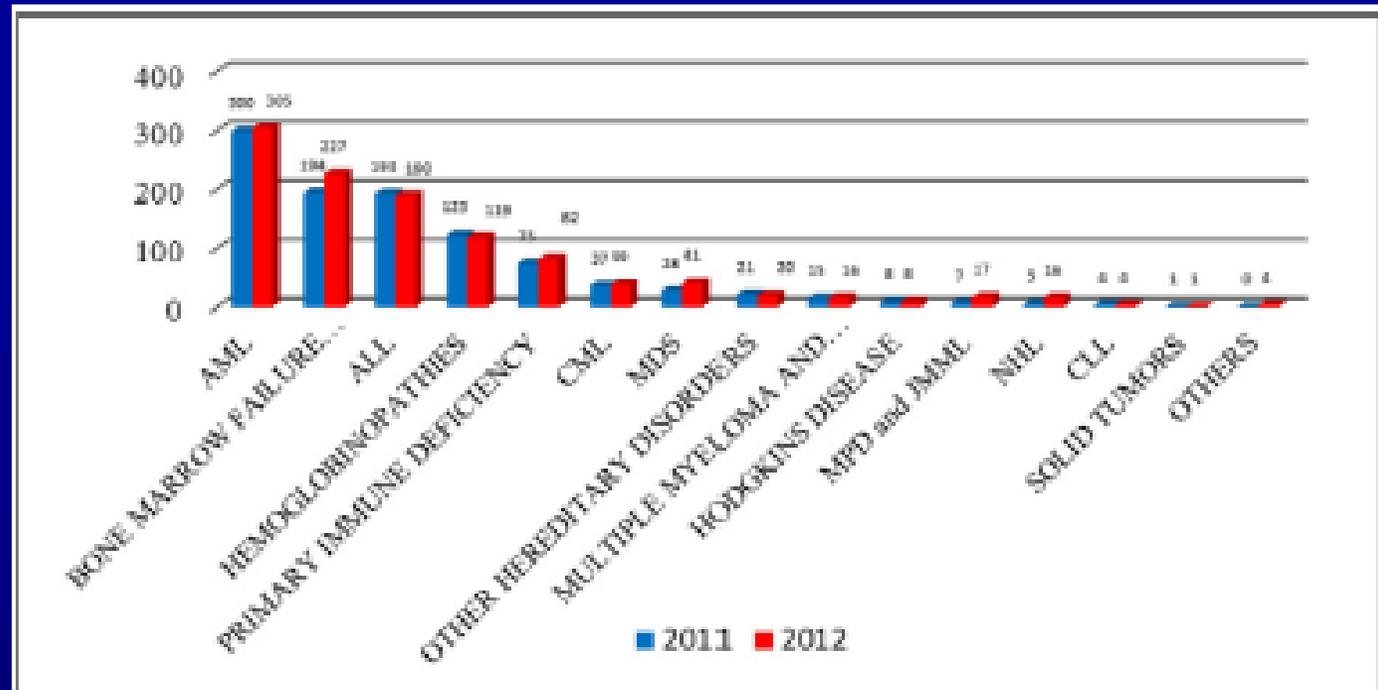


Transplant Numbers And Rates/10 Million Population

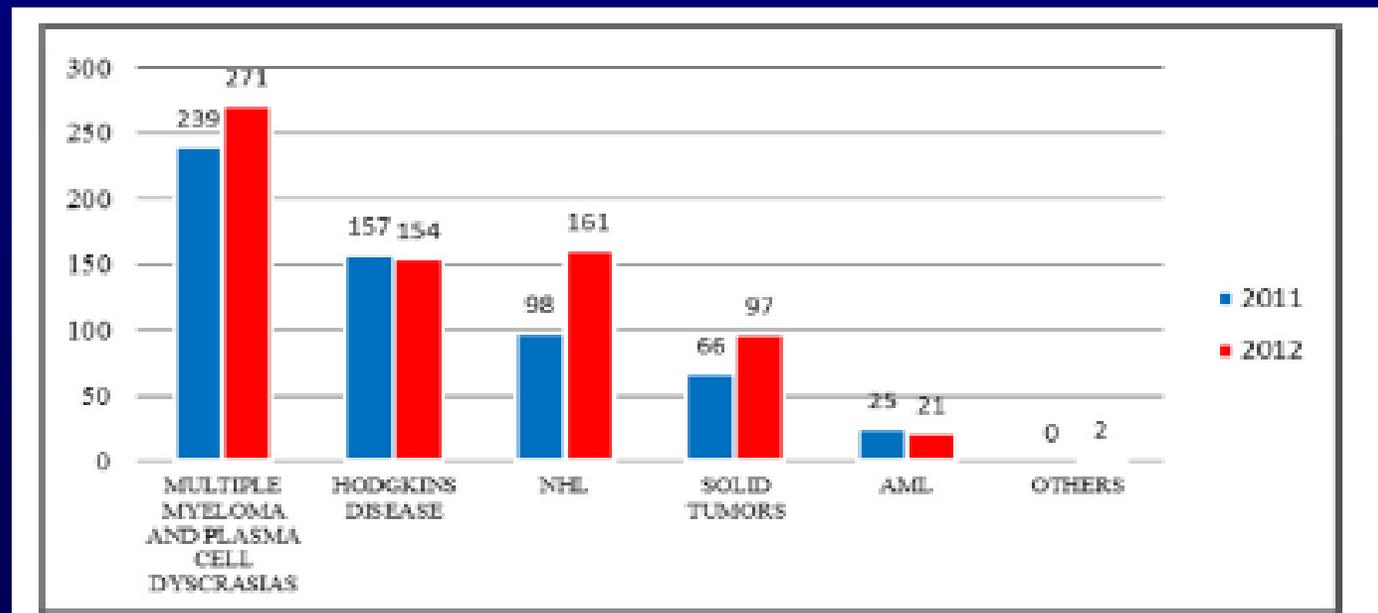
Country	2012		
	Population size	No. of transplant	% per 10 million
Algeria	38,481,705	173	4.470
Egypt	80,721,874	302	3.741
Iran	76,424,443	449	6.477
Lebanon	4,424,888	131	29.605
Oman	3,314,001	24	7.242
Pakistan	179,160,111	69	0.385
Saudi Arabia	28,287,855	464	14.953
Tunisia	10,777,500	101	9.371
Jordan	6,318,000	113	17.411



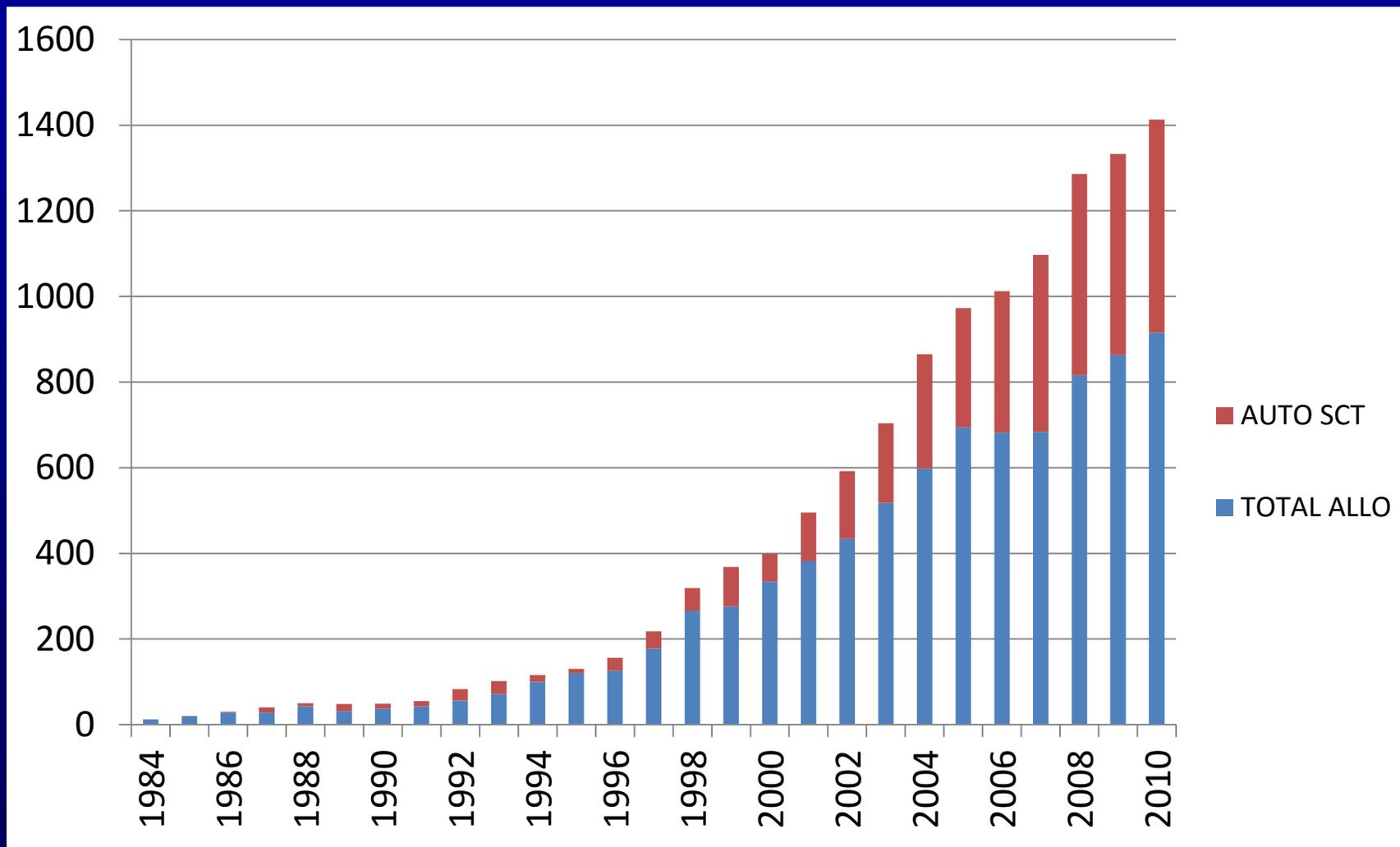
Indications for Allogeneic Transplantation 2011 & 2012



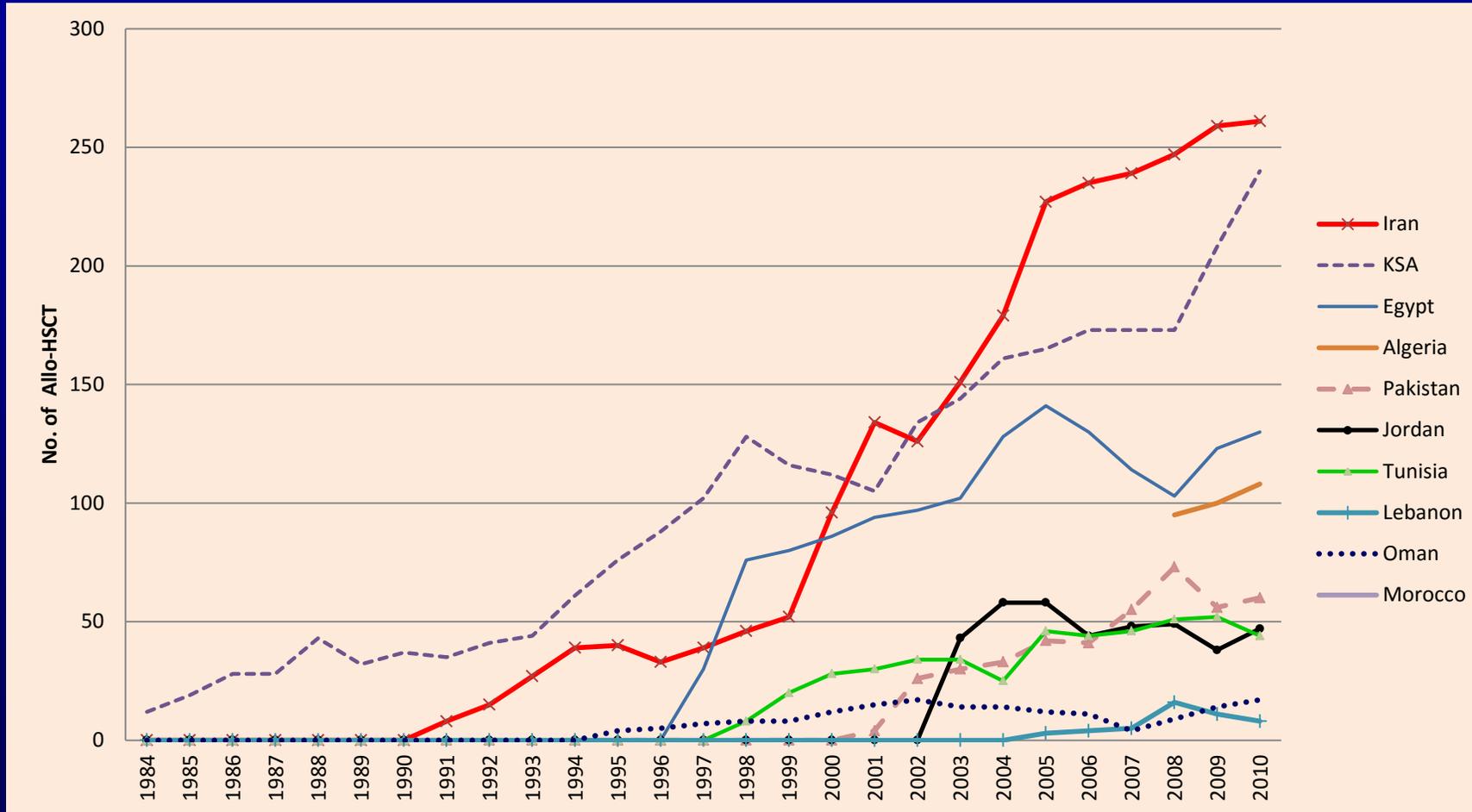
Indications for Autologous Transplantation 2011 & 2012



Overall Trends - Numbers



Allogeneic SCT: National trends



Regional Disparities in HSCT Activity¹

Economic factors

- GNI per capita
- HCE per capita
- Health care systems

Logistic factors

- Team density
- Team distribution

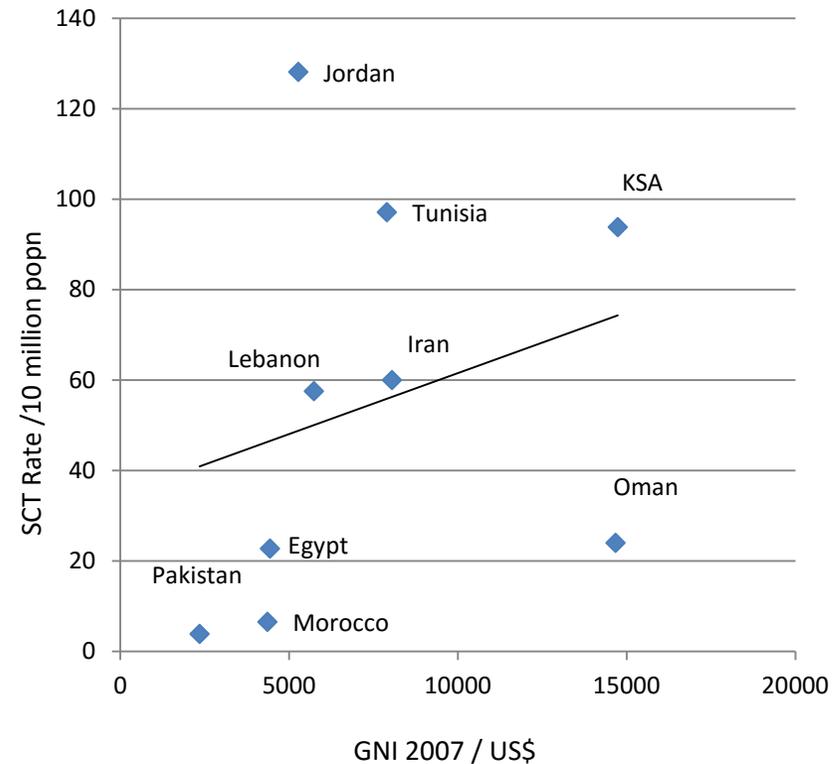
Local factors

- Disease prevalence
- Infrastructure

Others

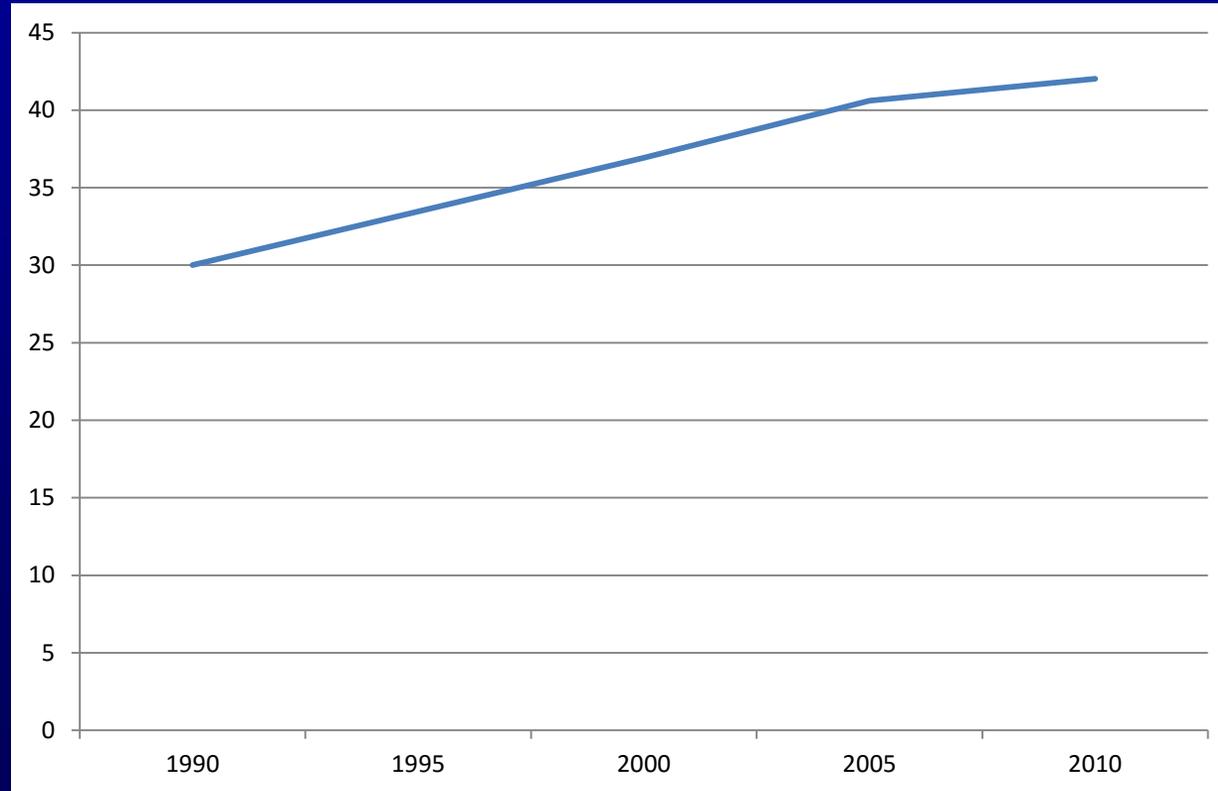
- Overseas referral practices

Transplant rates by GNI / 2007



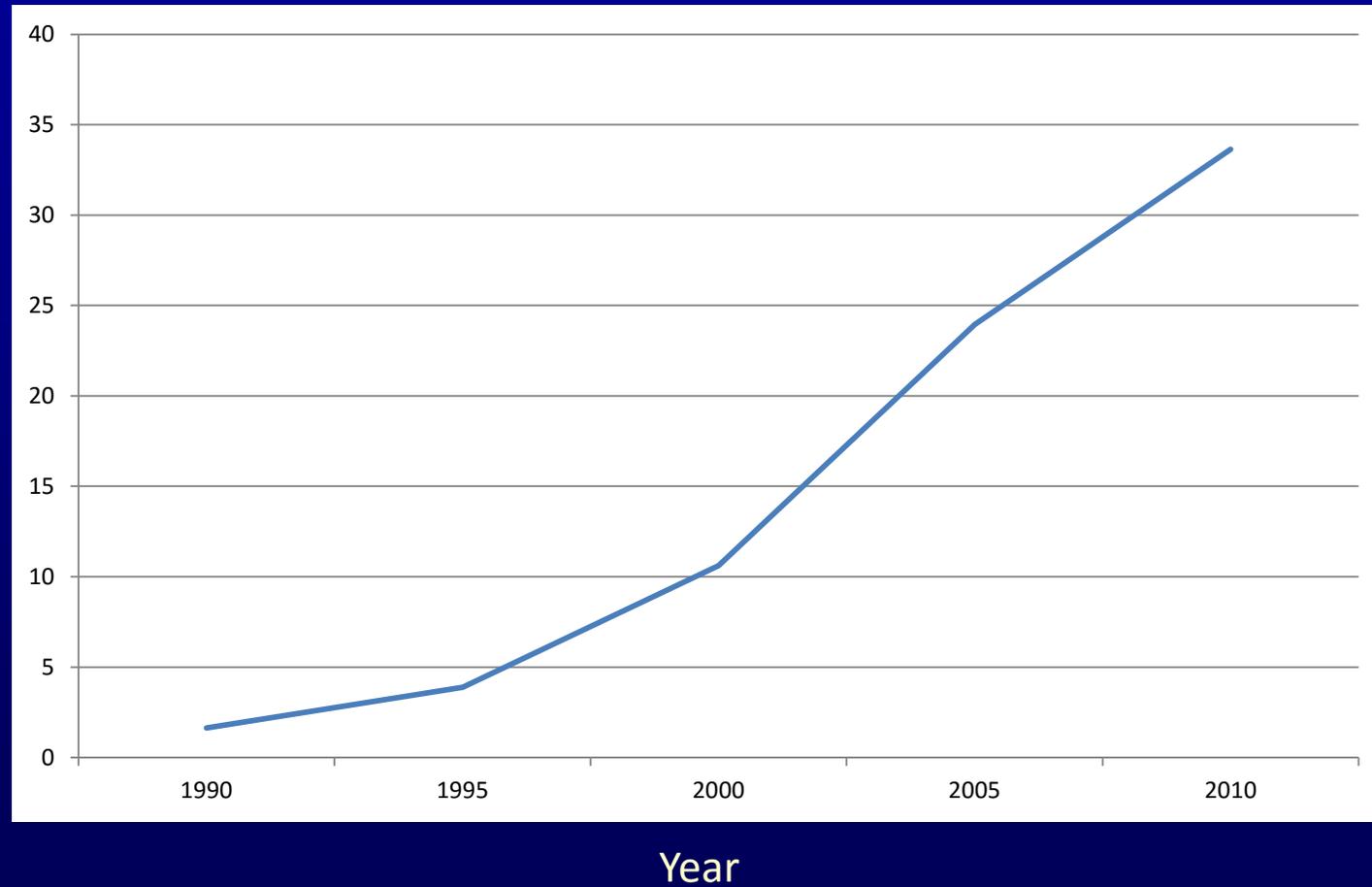
¹ Adapted from Gratwohl et al. *Bone Marrow Transplant*. 2008. 42:S7-S10

EMBMT Cumulative Population

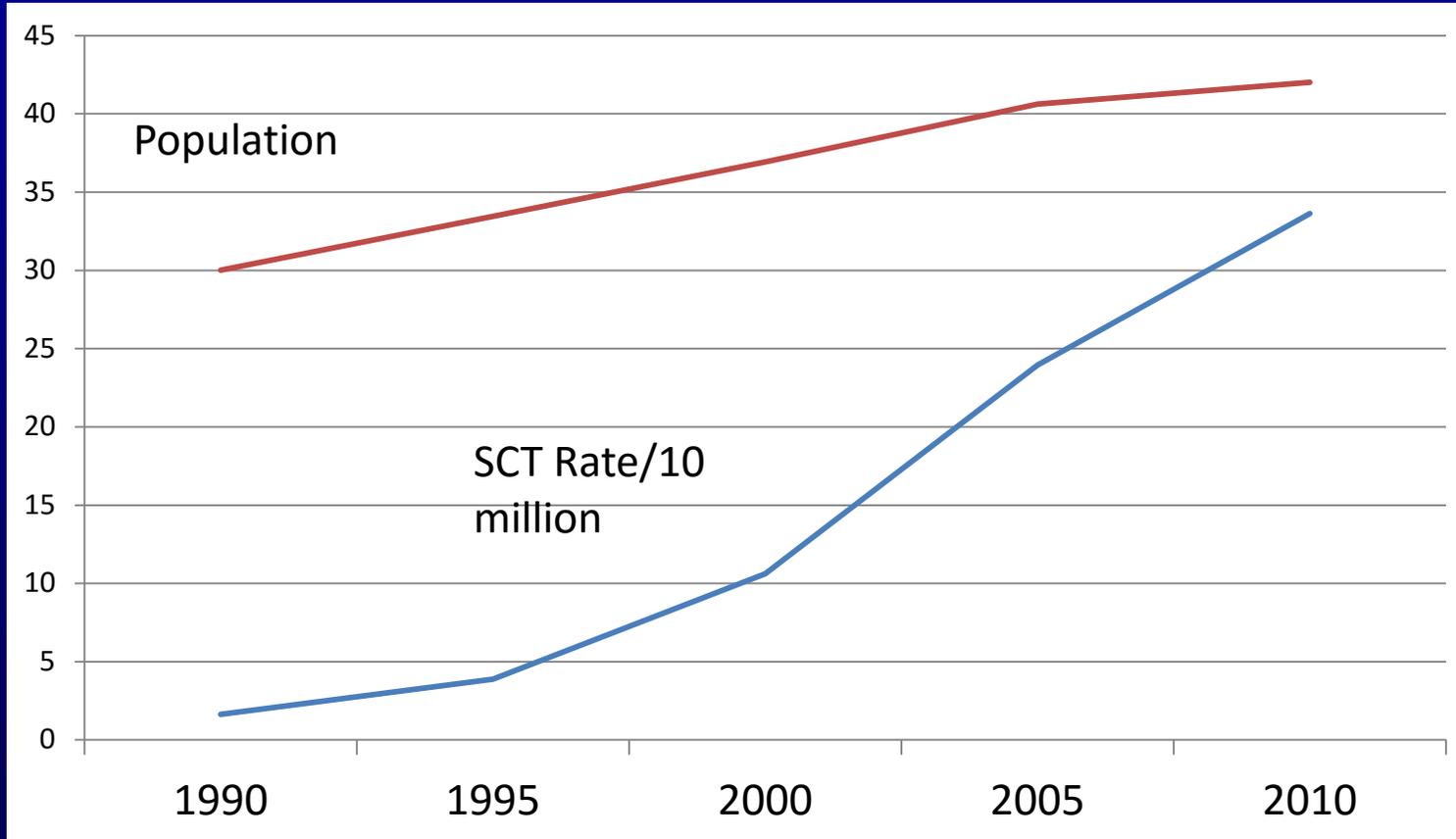


SCT Rates

SCT rates
/10 million
Popn.



Are we keeping up?



Transplant rates increasing at a rate greater than the rise in population

Increase in transplant activity in EMRO region is greater than that in Europe

How do transplant practices differ in the EMRO region from Europe / N.America ?

Hematopoietic Stem Cell Transplantation

A Global Perspective

Alois Gratwohl, MD
Helen Baldomero, BMS
Mahmoud Aljurf, MD
Marcelo C. Pasquini, MD
Luis Fernando Bouzas, MD
Ayami Yoshimi, MD
Jeff Szer, MD
Jeff Lipton, MD
Alvin Schwendener, MA
Michael Gratwohl, PhD
Karl Frauendorfer, PhD
Dietger Niederwieser, MD
Mary Horowitz, MD
Yoshihisa Kodera, MD
for the Worldwide Network of Blood and Marrow Transplantation

Table 2. Allogeneic and Autologous Hematopoietic Stem Cell Transplants by Region^a

	Americas (n = 17 875)	Asia (n = 7096)	Europe (n = 24 216)	Eastern Mediterranean and Africa (n = 1230)	Total (N = 50 417)
Allogeneic donor	7527 (42.1)	4058 (57.2)	9128 (37.7)	803 (65.3)	21 516 (42.7)
Relationship					
Family	4277 (57.0)	1948 (48.0)	4906 (53.7)	797 (99.3)	11 928 (55.4)
Unrelated	3250 (43.2)	2110 (52.0)	4222 (46.3)	6 (<1.0)	9588 (44.6)
Leukemia	5156 (68.5)	3119 (76.9)	6443 (70.6)	492 (61.3)	15 210 (70.7)
Lymphoproliferative disorders	1466 (19.5)	429 (10.6)	1579 (17.3)	28 (3.5)	3502 (16.3)
Solid tumors	32 (<1.0)	37 (1.0)	83 (1.0)	1 (<1.0)	153 (<1.0)
Nonmalignant disorders	755 (10.0)	418 (10.3)	946 (10.4)	277 (34.5)	2396 (11.1)
Other	118 (2.0)	55 (1.4)	77 (1.0)	5 (<1.0)	255 (1.2)
Autologous donor	10 348 (57.9)	3038 (42.8)	15 088 (62.3)	427 (34.7)	28 901 (57.3)
Leukemia	443 (4.3)	202 (6.6)	1136 (7.5)	58 (13.6)	1839 (6.4)
Lymphoproliferative disorders	8936 (86.4)	2380 (78.3)	12 336 (81.8)	338 (79.2)	23 990 (83.0)
Solid tumors	895 (8.6)	389 (12.8)	1459 (9.7)	29 (6.8)	2772 (9.6)
Nonmalignant disorders	49 (<1.0)	23 (1.0)	123 (1.0)	2 (<1.0)	197 (1.0)
Other	25 (<1.0)	44 (1.4)	34 (<1.0)	0	103 (<1.0)

Hematopoietic Stem Cell Transplantation

A Global Perspective

	AMERICAS	EUROPE	EMRO/AFRICA	TOTAL
ALLOGENEIC	7527	9128	803	21516
FAMILY	4277 (57%)	4906 (48%)	797 (99.3%)	11928
UNRELATED	3250 (43%)	4222 (46.3%)	6 (<1%)	

Nearly all allografts in EMRO and Africa are from family donors –

- Vs 57% in the Americas
- Vs 48% in Europe

Negligible numbers of MUDs:

- Unavailability of MUD registries, or nascent
- Higher chance of getting a matched related donor

Hematopoietic Stem Cell Transplantation

A Global Perspective

	AMERICAS	ASIA	EUROPE	EMRO/AFRICA	TOTAL
NON-MALIGNANT DISORDERS	755 (10%)	418 (10.3%)	949 (10%)	277 (34.5%)	2396

Program have greater relative experience and expertise in non-Malignant conditions vs Western counterparts

Strategic Priorities for HSCT in the EMRO Region

High Income Countries

High Income Countries : Transplant Activity



High Income Countries

- Establishing Transplant Centers...vs sending patients abroad...

High Income Countries

The image is a screenshot of a news article from Gulf Business. At the top left is the 'GULF BUSINESS' logo. To its right is a black banner for 'campaign' with the text 'COMMUNICATIONS, MARKETING & PR PROFESSIONALS' and 'We need your help!'. Below the banner is a navigation menu with 'HOME', 'GCC', 'INDUSTRY', 'AWARDS', and 'LISTS'. A 'TRENDING' section highlights 'French burger brand Big Fernand eyes Middle East expansion'. The main article is titled 'Kuwait allocates \$1bn to cover overseas treatment costs' by Robert Anderson, dated Monday 29 August 2016. A large red box is overlaid on the article, containing the text '12,000 patients' and '\$ 150,000 / patient'. The article's sub-headline reads 'The government had originally approved a \$500m budget for the treatment abroad programme'. The background image shows a stethoscope on top of several US dollar bills. On the right side, there is an advertisement for 'HealthCare INTERNATIONAL' featuring 'International Health Insurance' and icons for 'Life' and 'Travel'. Below the ad is a 'Most Read' section with a link to 'New fees for Saudi expats' dependents payable from July'.

GULF BUSINESS

campaign COMMUNICATIONS, MARKETING & PR PROFESSIONALS
We need your help!

HOME GCC INDUSTRY AWARDS LISTS

TRENDING French burger brand Big Fernand eyes Middle East expansion

Search

Kuwait

Kuwait allocates \$1bn to cover overseas treatment costs

The government had originally approved a \$500m budget for the treatment abroad programme

Robert Anderson

Monday 29 August 2016

12,000 patients
\$ 150,000 / patient

HealthCare INTERNATIONAL

International Health Insurance

Life Travel

Most Read

1 New fees for Saudi expats' dependents payable from July

High Income Countries: Priorities in Countries Without a Program

- Develop transplant programs in existing facilities
- Recruitment, training and retention of trained staff
- Cost effective, better for patients, better for **national healthcare independence**

High Income Countries: Countries With a Program

- Increasing Transplant rates:
 - Capacity Building
 - More Centers?
 - Or increase transplant capacity in large centers ?
- Treating patients in the context of trials
- Cellular therapies

Economies of Scale in HSCT

THE
Home World U.S. Polit

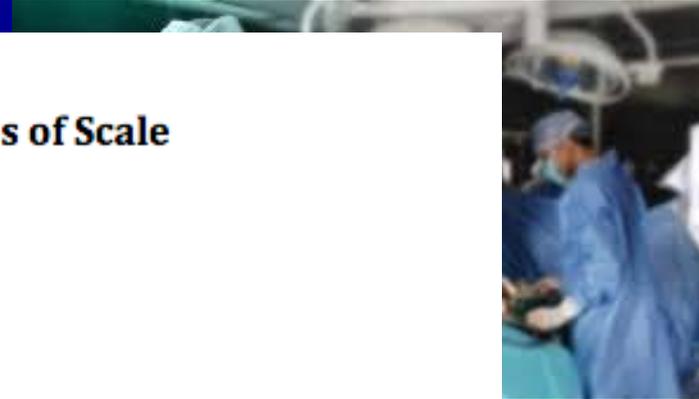
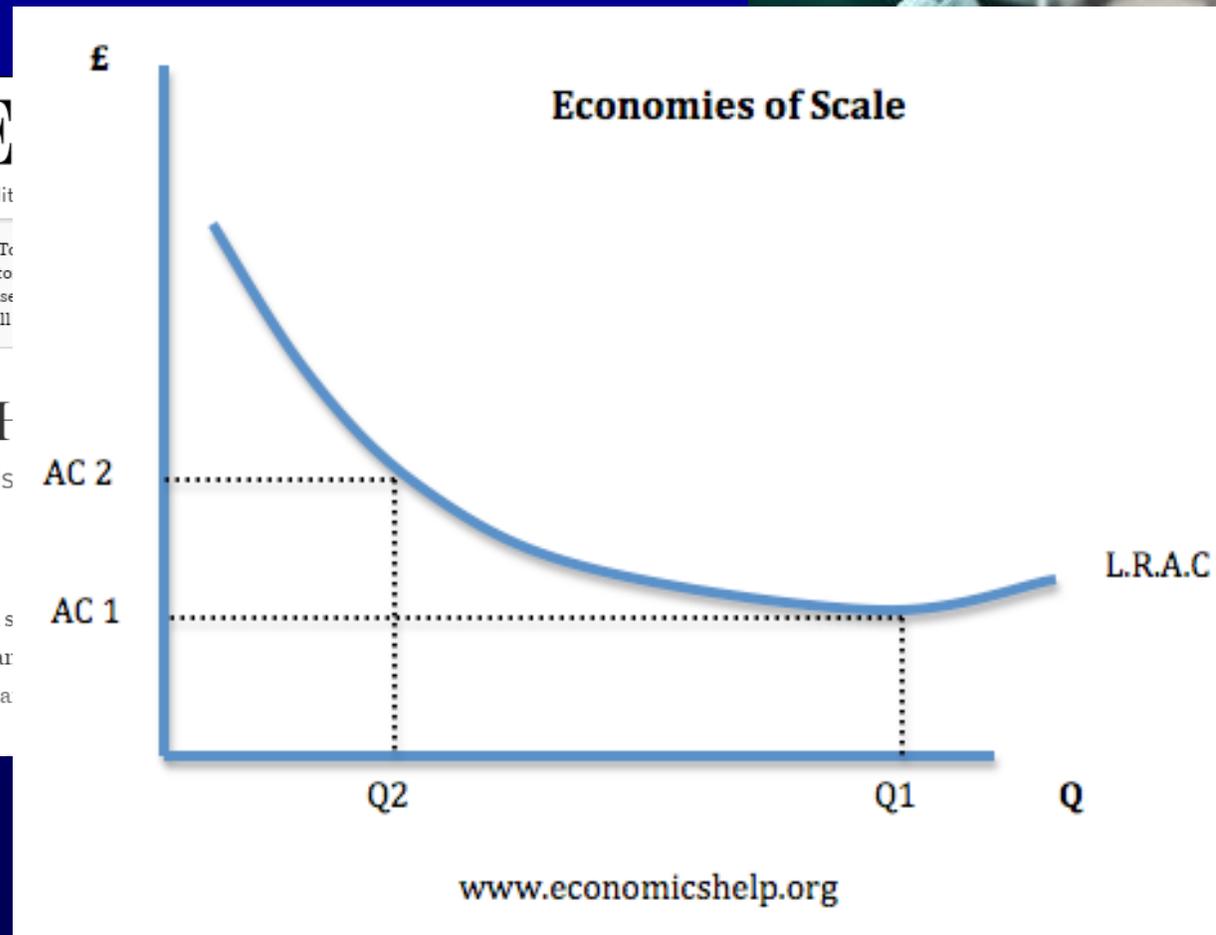
SpaceX Launches Rocket With 10 Iridium Satellites

To Custo House Small

HEALTH
The Henry Ford of I
In India, a Factory Model for Hospitals

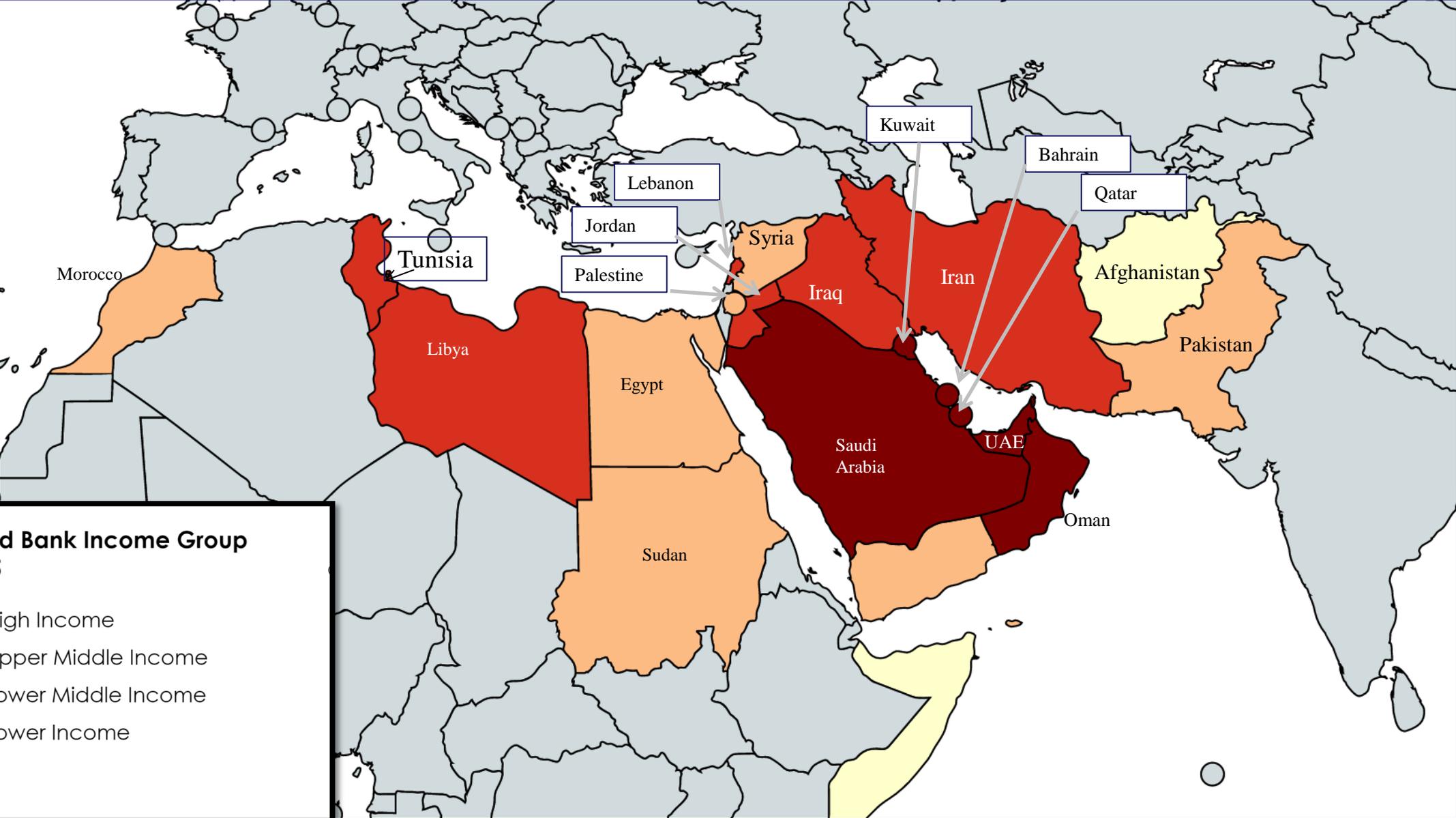
By **GEETA ANAND**
Updated Nov. 25, 2009 12:01 a.m. ET

BANGALORE -- Hair tucked into a magnifying glasses, Devi Shetty lear using bright blue thread to sew an a



Middle Income Countries

EMRO COUNTRIES BY WORLD BANK INCOME



Middle Income Countries

- Access to Transplant Services
 - Public / Private / Benevolence fund - collaboration
 - Subsidized co-payment
- Cost Effectiveness
- Big Pharma Investment!
 - Drug price negotiations (Emerging Markets \$\$)
 - Equal access to clinical trials
- Regulation and Quality



Low Medium/Low Income Countries

Is establishment of a *costly* transplant program in a low income country a healthcare priority?

Is it possible/ feasible to establish a costly transplant program in a low income country ?

A Model for Low Income Countries

The screenshot shows the Cure2Children website interface. At the top, there is a navigation menu with links: HOME, LATEST, POPULAR, PAKISTAN, TODAY'S PAPER, OPINION, WORLD, SPORT, BUSINESS, MAGAZINE, CULTURE, BLOGS, TECH, MULTIMEDIA, ARCHIVE, and a search icon. Below this is the 'DAWN' logo. The browser address bar shows 'www.cure2children.org'. The website header features the Cure2Children logo on the left, a navigation menu with 'WHO WE ARE', 'OUR PROJECTS', 'OUR NEWS', and 'GET INVOLVED', and a prominent red 'DONATE NOW' button on the right. The main content area is dominated by a 'STOP THALASSEMIA Fall Campaign' banner. This banner includes a grid of informational tiles: 'What's the problem?', 'Is there a Cure?', 'What is thalassemia?', 'How does it work?', '300,000 new cases each year.', 'Can this solution work?', 'What about prevention?', and 'How can I help?'. A central image shows a child in a hospital setting. To the right of the banner is a vertical sidebar with a blue header 'About C2C' and a list of locations: Jaipur, India; Islamabad, Pakistan; Colombo, Sri Lanka; Free HLA Typing; and Global Neuroblastoma Network. At the bottom of the banner, a text box states: 'Cure2Children is a non-profit helping children have access to a cure. everywhere.'

A Model for Low Income Countries

INVITED REVIEW ARTICLE

International Cooperation for the Cure and Prevention of Severe Hemoglobinopathies

Lawrence B. Faulkner, MD



OPEN ACCESS

A prospective international cooperative information technology platform built using open-source tools for improving the access to and safety of bone marrow transplantation in low- and middle-income countries

Rajat Kumar Agarwal,¹ Amit Sedai,¹ Sunil Dhimal,¹ Kumari Ankita,¹ Luigi Clemente,² Sulman Siddique,² Naila Yaqub,³ Sadaf Khalid,³ Fatima Itrat,³ Anwar Khan,³ Sarah Khan Gilani,³ Priya Marwah,⁴ Rajpreet Soni,⁴ Mohamed El Missiry,² Mohamed Hamed Hussain,² Cornelio Uderzo,² Lawrence Faulkner²

A Model for Low Income Countries

- Eg: cure2children
 - Italian Non-Governmental Organization,
- Supported BMT network in Pakistan.
- Matched-related BMT for thalassemia in young low-risk children
- 100 matched-related BMTs : > 90% disease-free survival
- **\$10,000 USD**
- **Outcome comparable to that obtained in affluent countries but with a fraction of the expenses.**
- **Projects in: Malawi, Afghanistan, India, Sri Lanka**

Strategic Priorities for Region - I

- Access to transplantation
 - Transplant rates are lower than in similar sized European countries
- Transplantation programs for region-specific diseases
 - Hemoglobinopathies
 - Bone Marrow failure
 - Acute leukemia
 - Autos vs allos?

Strategic Priorities for Region - II

- Training and Infrastructure development:
 - Center ‘Mentoring’
 - Exchange Programs
- IT optimization
 - Social Media , teleconferencing



Special opportunities for research

I. Retrospective analyses:

- HSCT for Beta Thalassemia
- HSCT for Sickle Cell Anemia
- Acute Myeloid Leukemia with t(8;21)
- Acute Myeloid Leukemia with other CG abnormality (WHO)
- Rare leukemias and diseases
- Tuberculosis/HCV in HSCT
- BCG immunodeficiency
- Schistosomiasis in HSCT / VOD
- Rare infections
- Fanconi Anemia
- Other rare congenital bone marrow failure syndromes
- Acquired Severe Aplastic Anemia
- HLA Phenotype Clustering
- HSCT for severe immunodeficiency

III. Prospective research opportunities:

- Multicenter Studies
- Pharmacogenomics
- GVHD related research

II. Registry based:

- Trends
- Practice Survey
- Disease Specific
- Regional survey
 - EMBMT Activity Survey
 - Current status
 - Comparison
 - Patterns
- Regional donor follow up

The image shows a complex survey form titled "EMBMT 2010-2011 SURVEY FORM". It is a grid-based form with multiple columns and rows, designed for data collection from various transplant centers. The form includes sections for patient demographics, clinical details, and transplant outcomes.

IV. Unique opportunities/Donor availability:

- 65% HLA matched family donor availability
- 35% no matched family donor
- One antigen mismatch do as well as full match
- Need for national registry & Alternate Donor Program
- Gene Polymorphism
- Low likelihood of GVHD
- High prevalence of non-neoplastic disorders as an indication
- Hepatitis B & C virus infection
- High seropositivity of CMV infection

Acknowledgement

- Transplant Program Directors
 - Algeria
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 - Jordan
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 - Lebanon
 - Morocco
 - Oman
 - Pakistan
 - Tunisia
- EBMT
- IBMTR

