

Blood and Marrow Transplantation: Jordan Experience



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Jordan



Population

Population: 9,531,712

Geography

Health
Indicators

Socioeconomic
Indicators



Jordan



Population

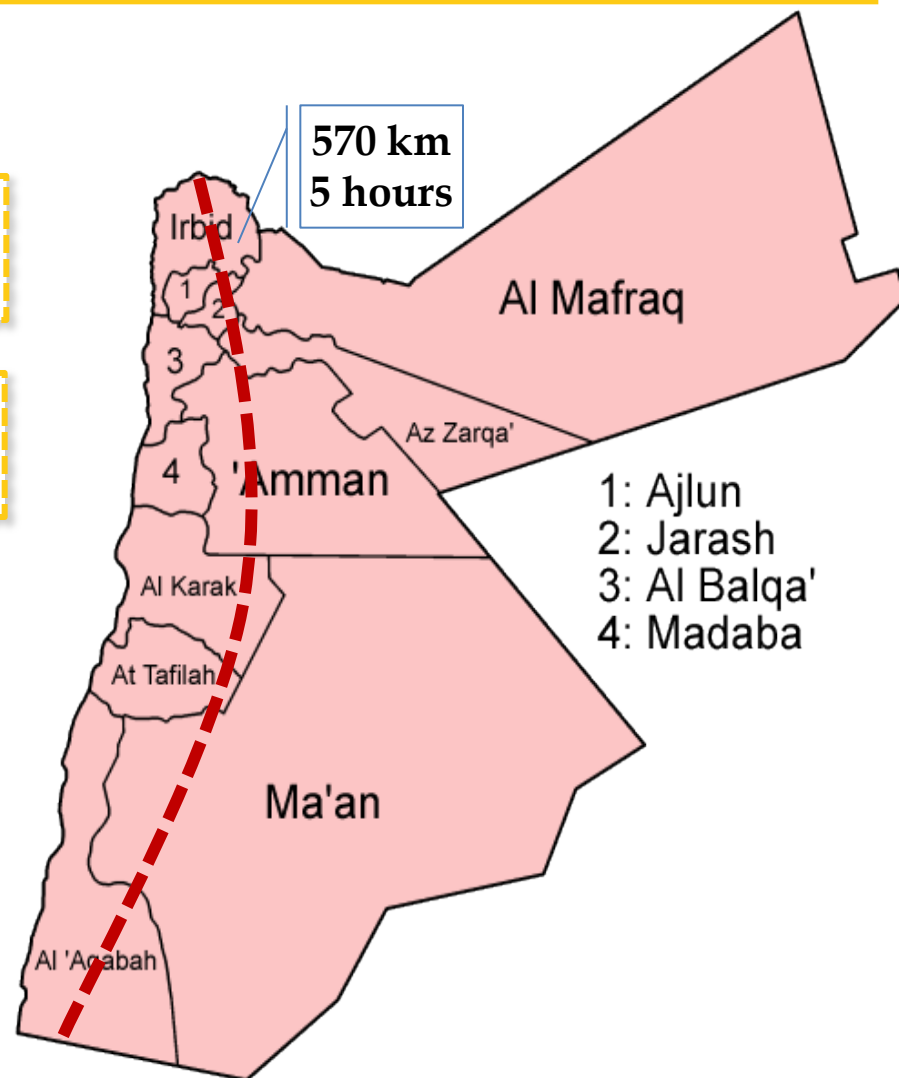
Population: 9,531,712

Geography

Distances: 570 km north to south

Health Indicators

Socioeconomic Indicators



Jordan



Population

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Health Indicators

Life expectancy @ birth =74.4 Years

Socioeconomic Indicators



Jordan



Population

Population: 9,531,712

Geography

Distances: 570 km north to south

Health Indicators

Life expectancy @ birth =74.4 Years

Socioeconomic Indicators

Unemployment rate: 12.6%



Jordan Population



- **Central Region:**

- Amman
- Az Zarqa
- Al Balqa
- Madaba



Jordan Population



- **Central Region:**

- Amman
- Az Zarqa
- Al Balqa
- Madaba

63%



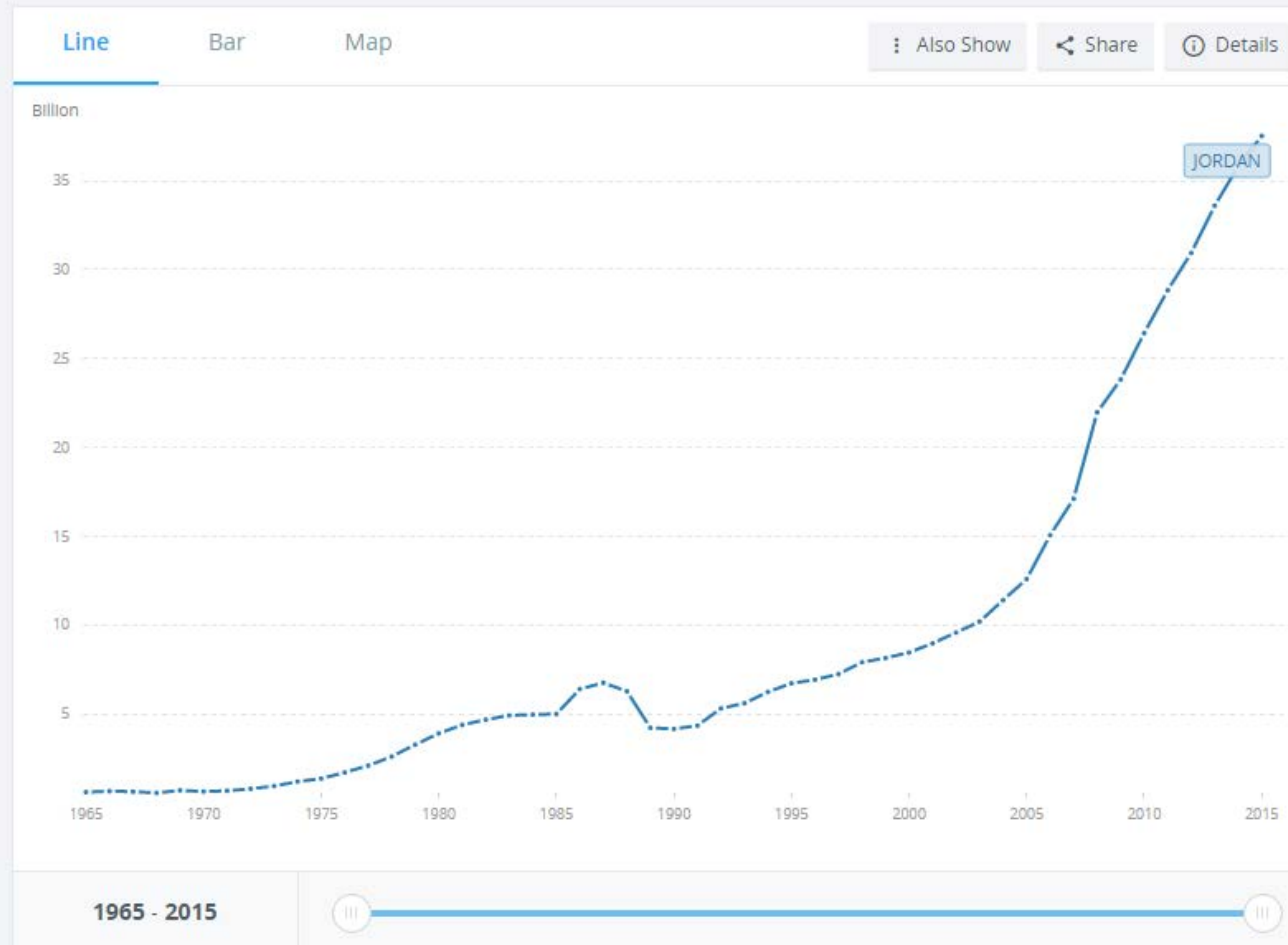
Gross Domestic Product



GDP (current US\$)

World Bank national accounts data, and OECD National Accounts data files.

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JOR (2015)
37.517
Billions

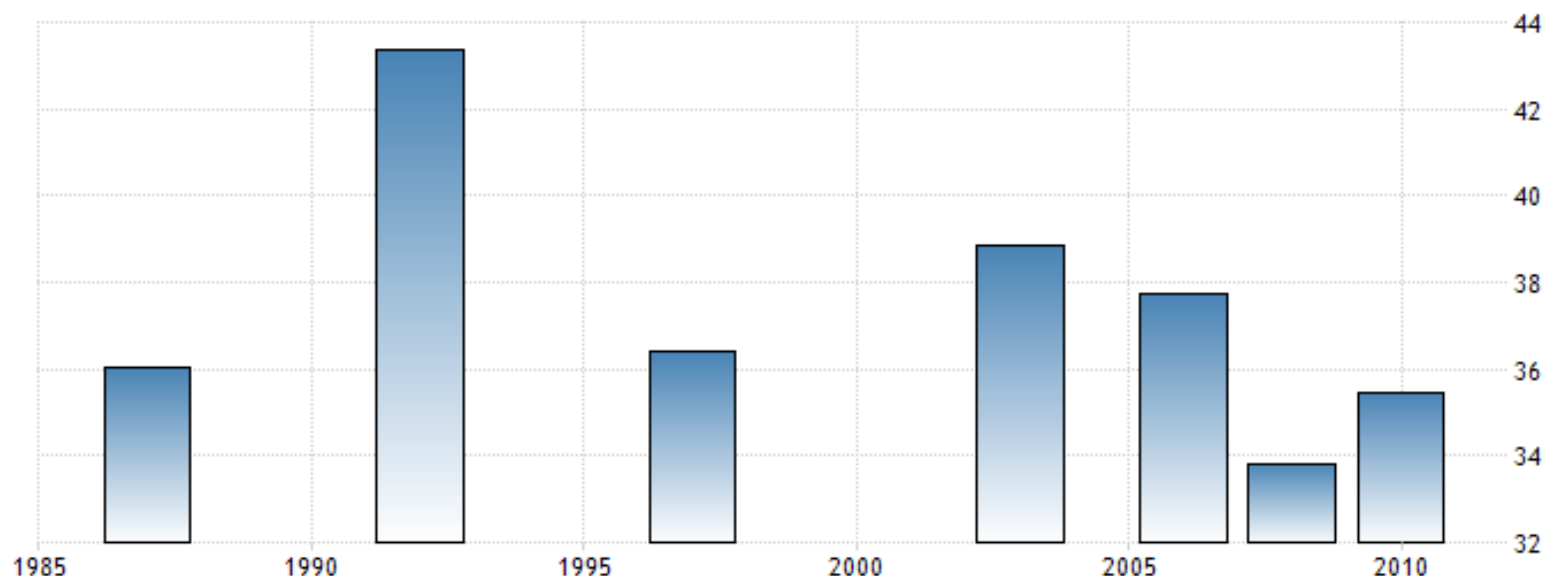
JOR (2015)
3976.04 US\$
Per Capita

World Bank Data
Last updated
Jan 10, 2017

GINI index - Jordan



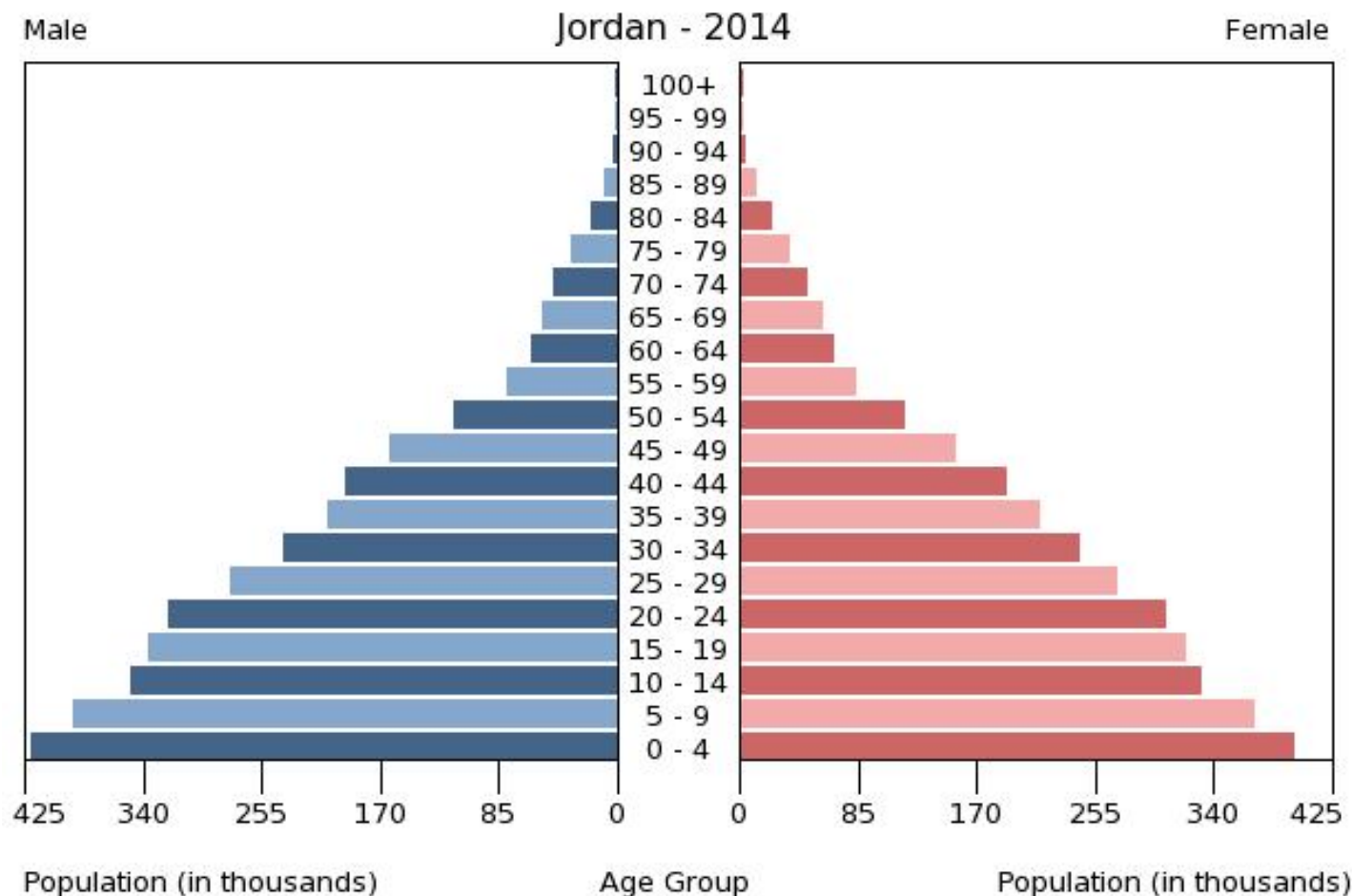
GINI index in Jordan was last measured at **35.43** in 2010, according to the World Bank



Note: a Gini index of 0 represents perfect equality, while an index of 100 implies perfect inequality.

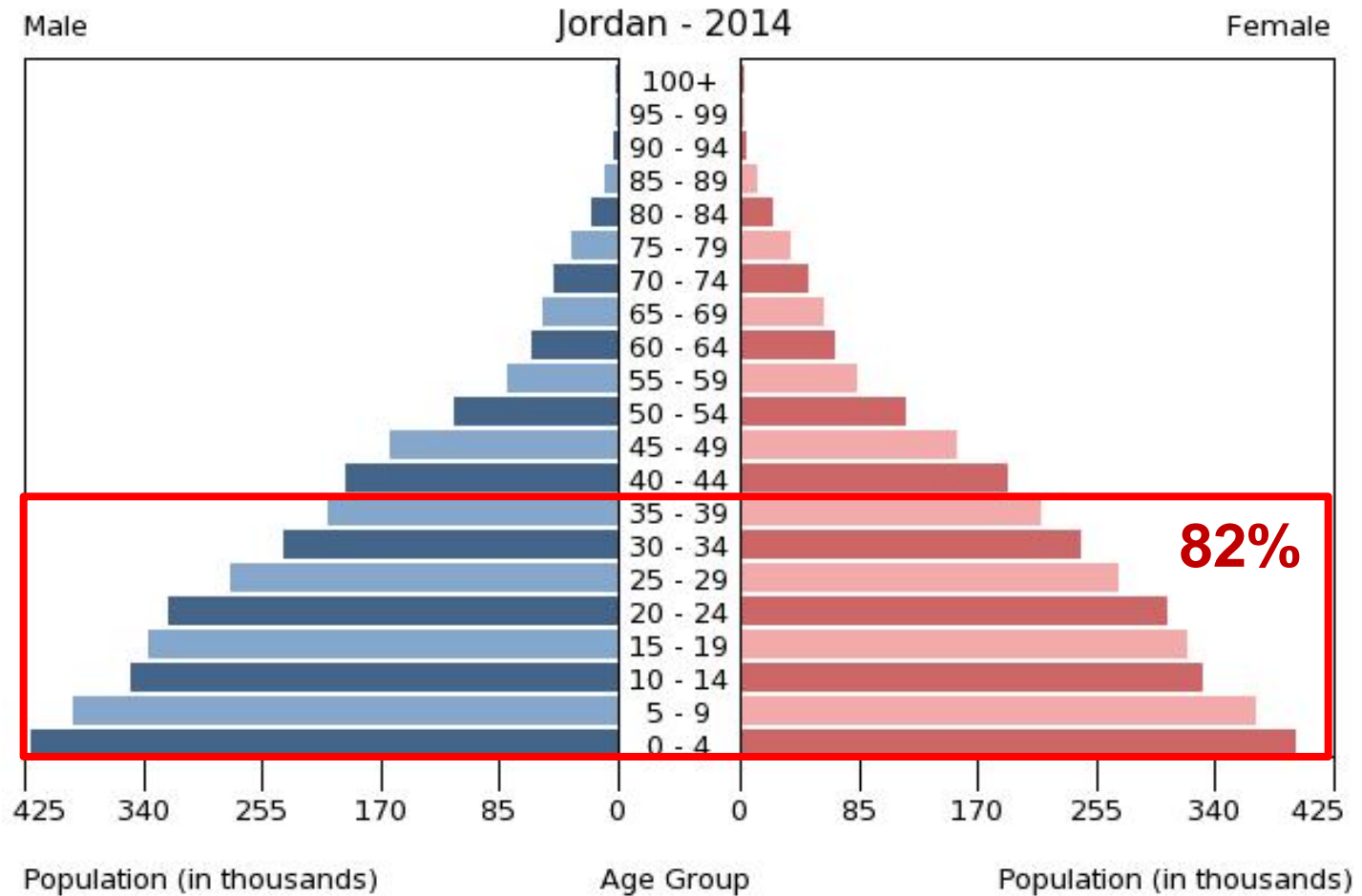
<http://www.tradingeconomics.com/jordan/gini-index-wb-data.html>,
last visited January 11, 2017

Population Pyramid of Jordan



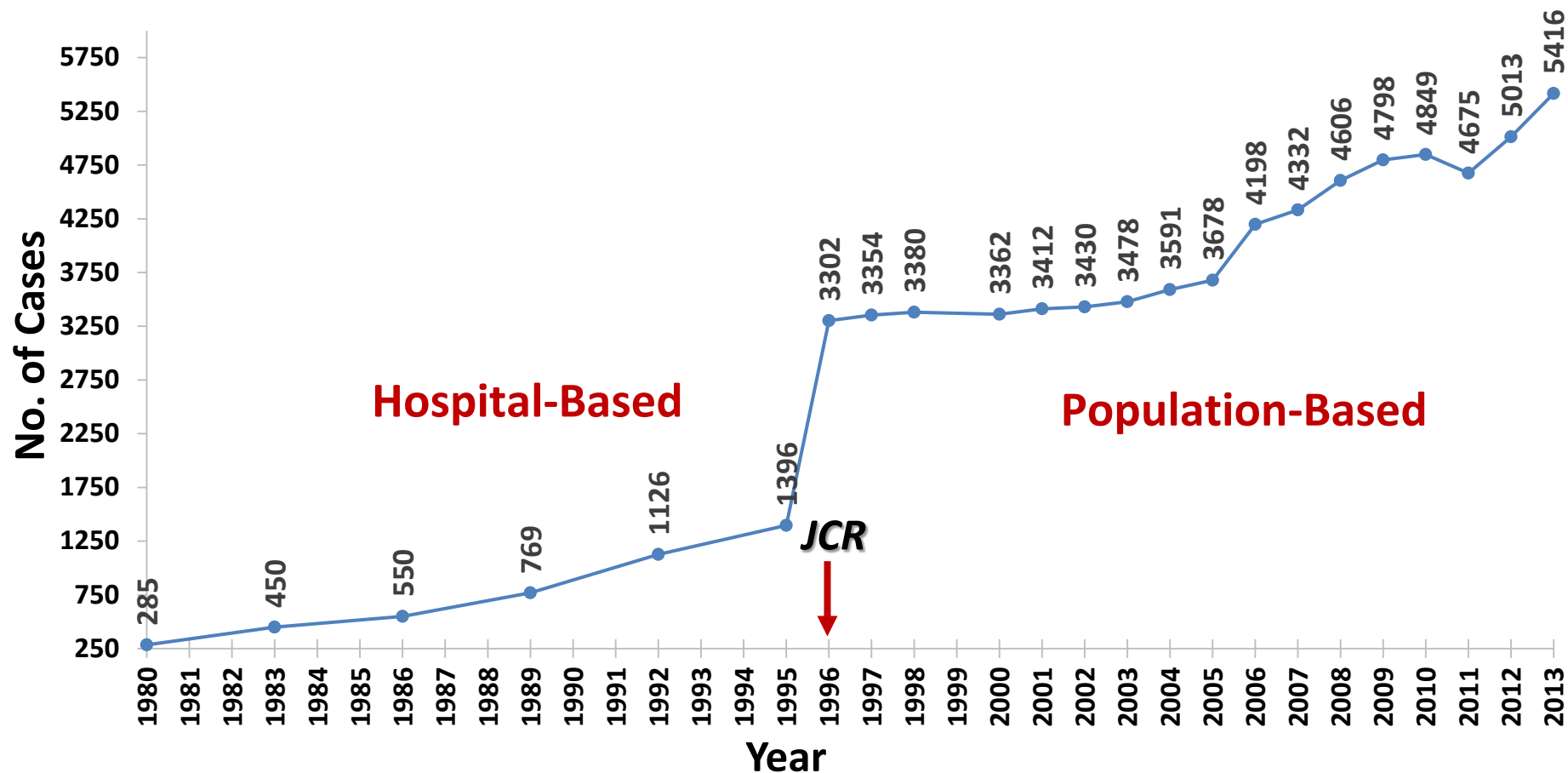
Population Pyramid , Jordan 2014

Population Pyramid of Jordan



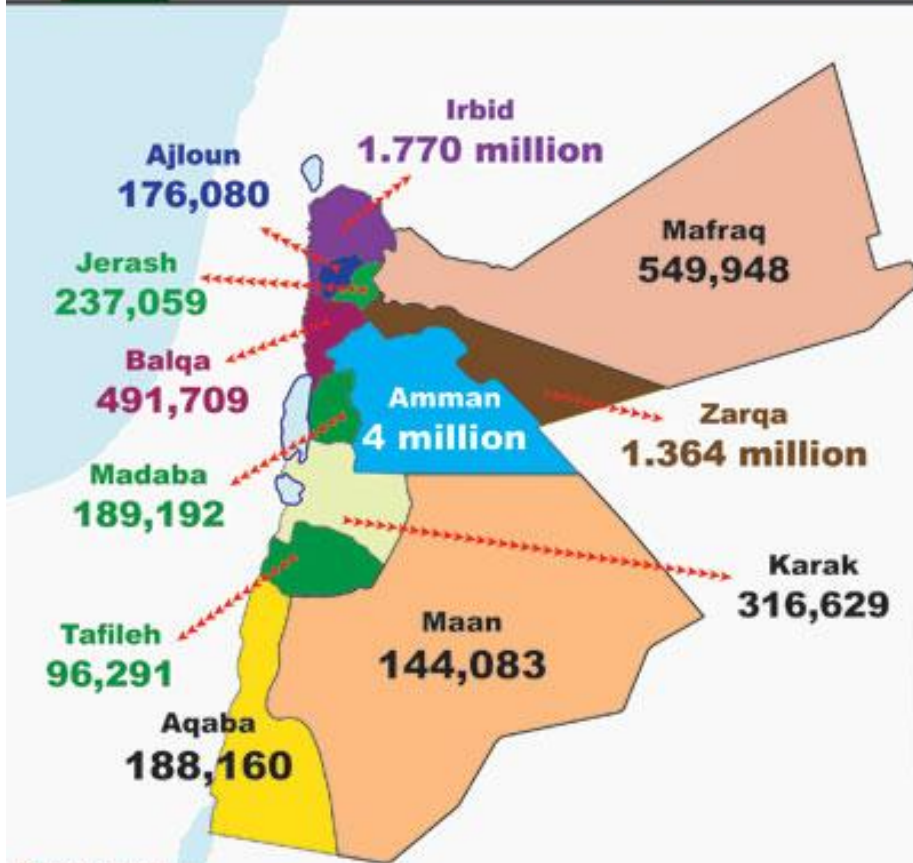
Population Pyramid , Jordan 2014

Cancer Trends in Jordan

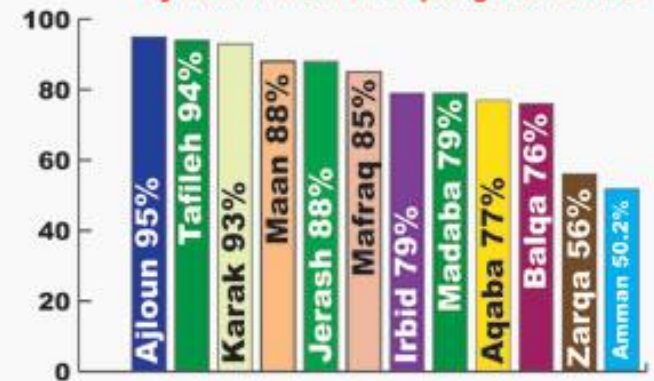


Jordan's population 9.523 million

66%



Percentage of Jordanians covered by health insurance per governorate



Population of non-Jordanians per nationality



Annual BMT Numbers



115-145

• King Hussein Cancer Center

20-30

• Private Sector

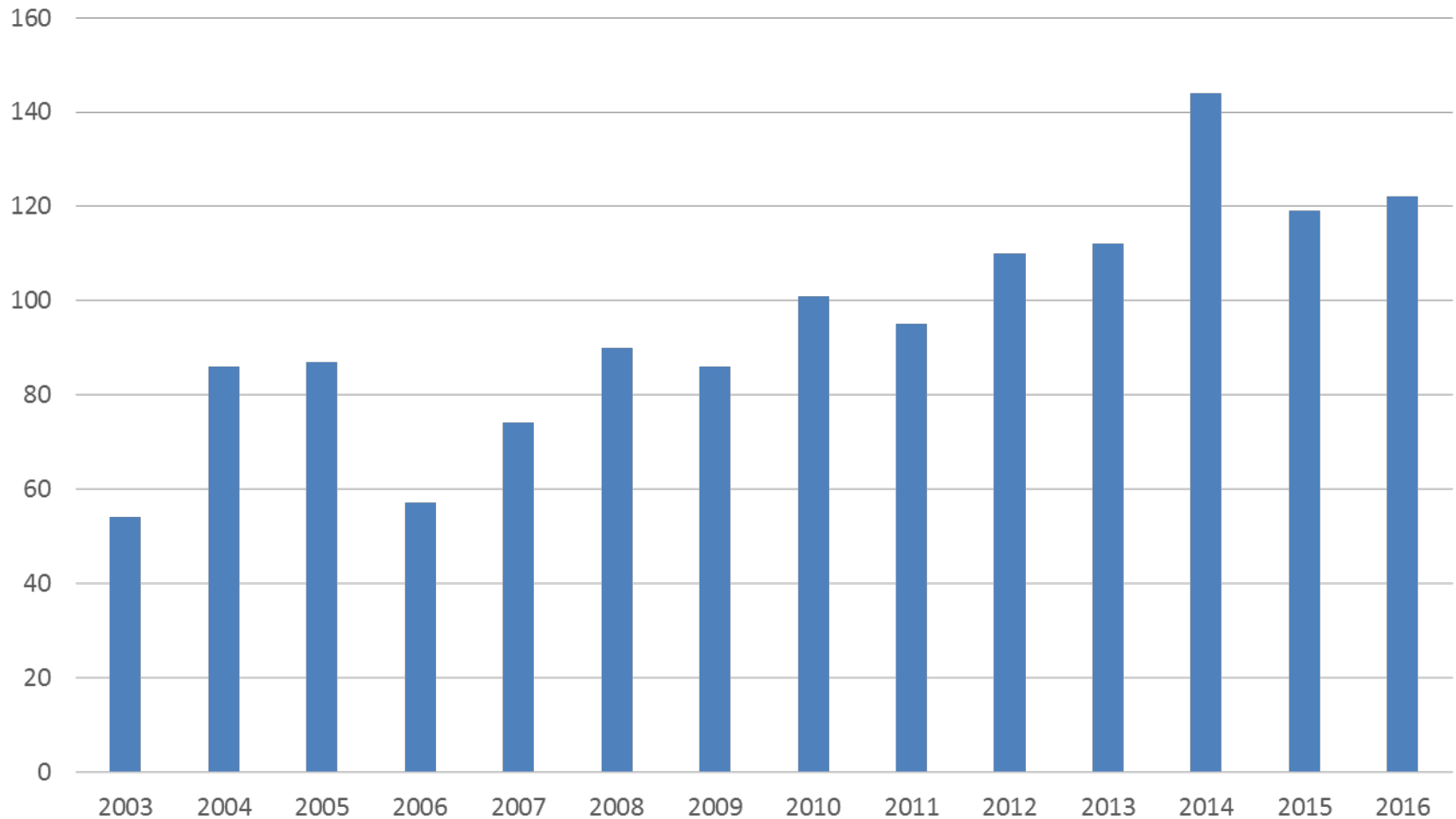
20-25

• Royal Medical Services

5-15

• University of Jordan

KHCC / BMT per year



KHCC Stats - Demographics



Total BMT (2003-2016)

1337

Allogeneic

794 (59.4%)

Autologous

543 (40.6%)

KHCC Stats - Demographics



Total BMT (2003-2016)

1337

Adults

726 (54.3%)

Pediatrics

611 (45.7%)

KHCC Stats - Demographics



Total BMT (2003-2016)

1337

Males

805 (60.2%)

Females

532 (39.8%)

KHCC Stats - Demographics



Total BMT (2003-2016)

1337

Jordanians

1078 (80.6%)

Non-Jordanians

259 (19.4%)

Allogeneic BMT



Donor Source	Total	Adults	Pediatrics
Matched Sibling	638 (80.4%)	291	347
Matched Other Relative	66 (8.3%)	10	56
Mismatched Relative (one antigen mismatch)	19 (2.4%)	2	17
Haploidentical	37 (4.7%)	5	32
UCBU	31 (3.9%)	3	28
MUD	3 (0.33%)	2	1
TOTAL	794	313 (39%)	481 (61%)

Biol Blood Marrow Transplant. 2013 Feb;19(2):221-6. doi: 10.1016/j.bbmt.2012.09.009. Epub 2012 Sep 28.

Probability of finding an HLA-matched donor in immediate and extended families: the Jordanian experience.

Elbjeirami WM¹, Abdel-Rahman F, Hussein AA.

Author information

Abstract

Information regarding the probability of finding HLA-matched related donor for a patient awaiting hematopoietic stem cell transplantation (HSCT) in developing countries is scanty. We performed a retrospective review of HLA genotypes and related data for 1254 consecutive patients and their families at King Hussein Cancer Center in Amman, Jordan, between 2003 and 2011 to evaluate the chance of finding HLA-matched donor. The median family size was 5 for all patients in the study (range, 1-14), and the average number of donors was 1.4 ± 0.9 for pediatric patients and 1.6 ± 0.9 for adults. Overall, the probability of finding an HLA-matched related donor at our center was 65.5% (60.6% in pediatric patients and 74% in adults). Of the total identified donors, 18% were nonsibling donors after an immediate and/or extended family search in the pediatric group, and 6% were nonsibling donors in the adult group. Overall, 13% of donors were nonsibling donors. We conclude that the probability of finding a matched related donor for HSCT in Jordan is much higher than that reported in Western countries and Asia (65% versus 25%). We expect a similar trend in other developing and Arab countries. We recommend integrating an extended family search before or concomitantly with an unrelated donor search.

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KHCC Stats - Indications



Total BMT (2003-2016)

1337

Malignant

1013 (75.8%)

Non-Malignant

324 (24.2%)

BMT Indications - KHCC



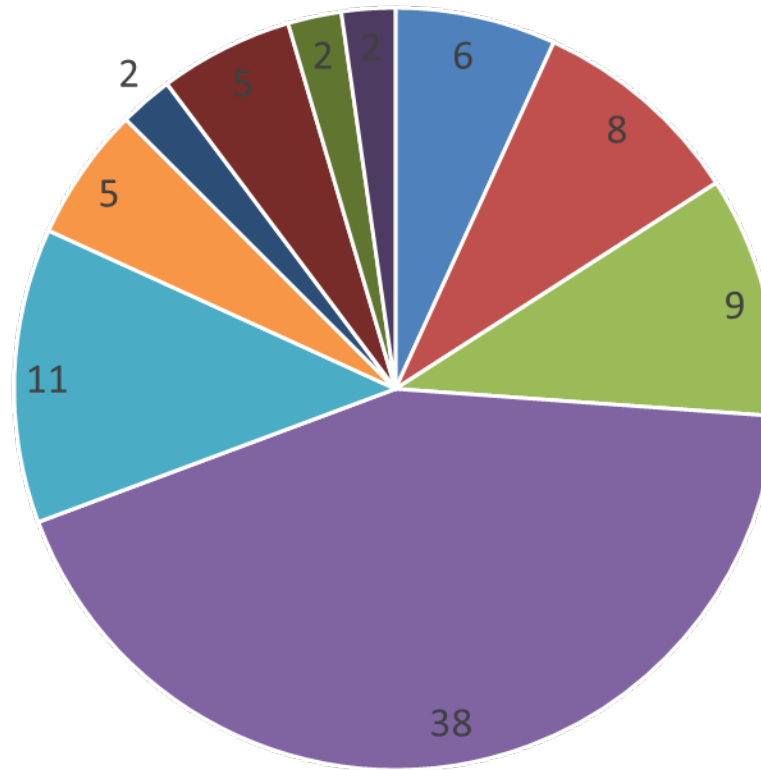
Disease	Number	Percentage
Leukemia	377	(28.2%)
Lymphoma	314	(23.3%)
Plasma cell Disorders	160	(12%)
Solid tumors	118	(9%)
MDS/MPN	44	(3%)
Hemoglobinopathies	148	(11.1%)
Bone Marrow Failure	118	(9%)
Immunodeficiency Disorders	46	(3%)
Inherited Disorders	12	(1.4%)
TOTAL	1337	

A blue bracket on the right side of the table groups the first three rows (Leukemia, Lymphoma, and Plasma cell Disorders). To the right of this bracket, the percentage **63.5%** is displayed in red text.

BMT Indications - RMS



Immunodeficiency cases (87)



■ LAD ■ HLgM ■ CID ■ SCID ■ CGD ■ Griscelli ■ FHLH ■ CHS ■ Kostmann's ■ SCN

Courtesy of DR. Adel Al-Wahadneh, RMS

BMT Indications - Private



Total BMT (Jan 2013- Dec 2016) = 53

Allogeneic (37, 70%)

Autologous (16, 30%)

Adults (14, 26%)

Pediatrics (39, 74%)

Malignant (31, 58%)

Non Malignant (22, 42%)

Disease Category

Leukemias

13 (24.5%)

Lymphomas

8 (15.1%)

Solid Tx

8 (15.1%)

MDS

2 (3.8%)

Hemoglobinopathy

8 (15.1%)

B.M.F

8 (15.1%)

Inherited /Autoimmun Disorders

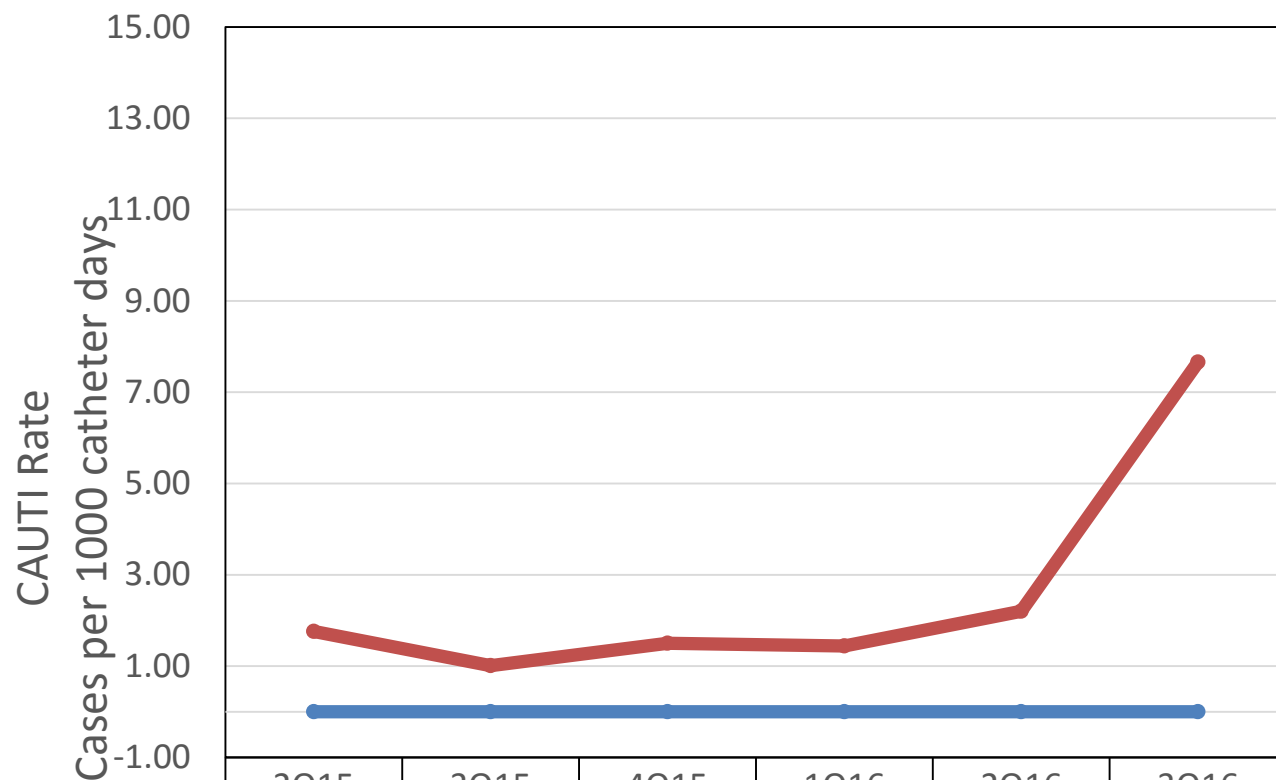
6 (11.3%)

Average Cost for BMT (US \$)



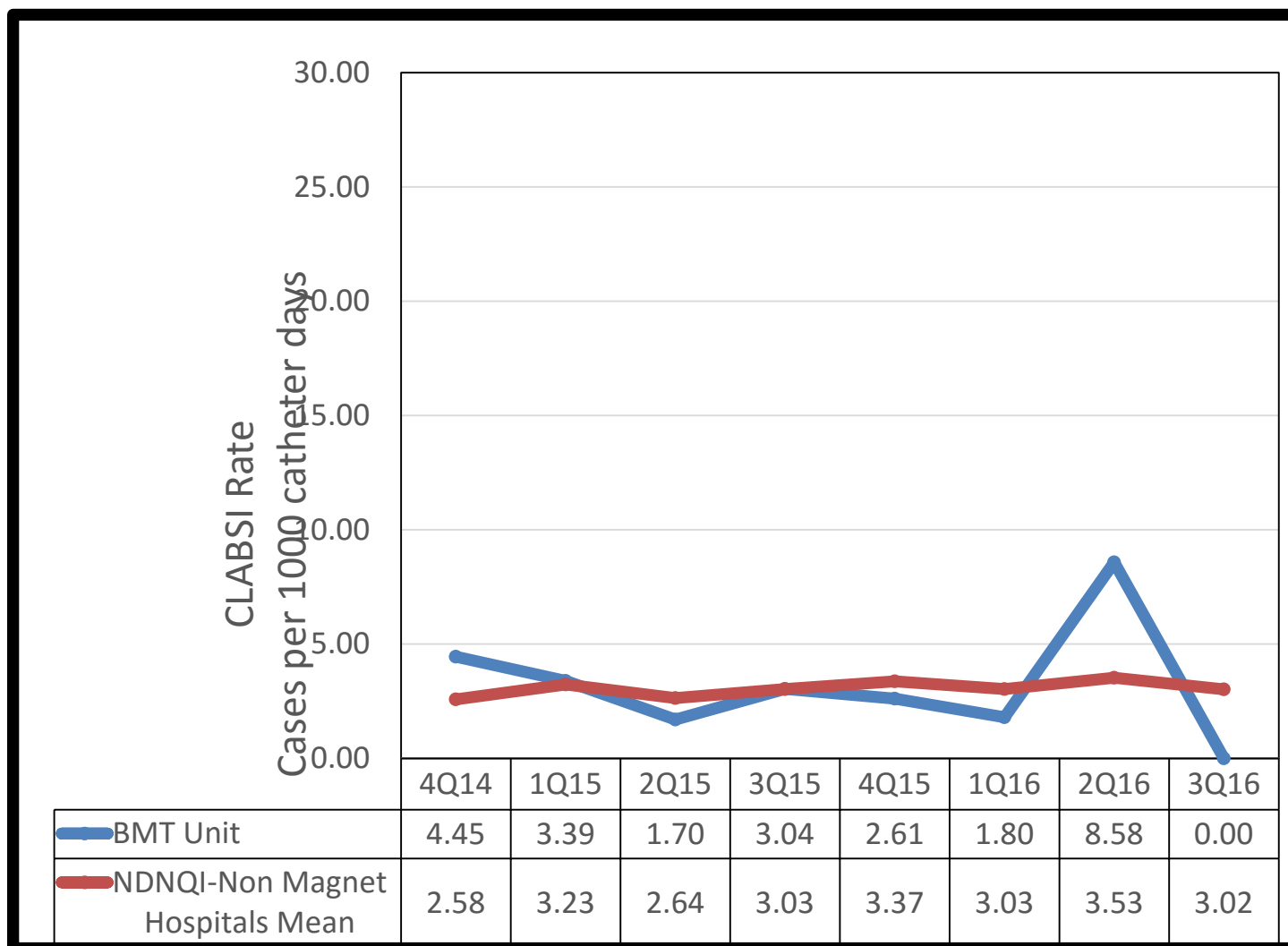
Type of Transplant	Auto	Allo
Evaluation pre Admission	15637.13	19546.41
Transplant Admission	36734.43	45918.04
Post BMT Discharge – Day 100	19811.83	22783.61
Donor workup		4758.64
Total Average Cost	72183.39	93006.70

CAUTI Rates



BMT Unit	0.00	0.00	0.00	0.00	0.00	0.00
NDNQI-Non Magnet Hospitals Mean	1.76	1.01	1.50	1.44	2.20	7.66

CLABSI Rates



BMT in Jordan - Challenges



- **Financial issues**
 - Jordanians
 - Non-Jordanians
 - Medication prices (e.g., BEAM)
- **Space and bed availability**
- **Accommodations (patients and families)**



KHCC: Future Plans



182 Single beds (+ 172 existing => 350)(including AICU, PICU)
6 Operating Rooms
1 Emergency Room (19 beds)
1 Outpatient Building

Research Interests



- **Surgical complications of BMT**
- **BMT of Myeloma and lymphomas**
- **BMT of Thalassemia**
- **CMV reactivation in Auto BMT**
- **Bacterial infections**
- **BMT Conditioning and Mobilization**
- **Histocompatibility & Immunogenetics**
- **Cord Blood banking**
- **Stem cell processing**

Acknowledgments



KHCC

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Thank you

