

Hematopoietic Stem Cell Transplantation in Pakistan

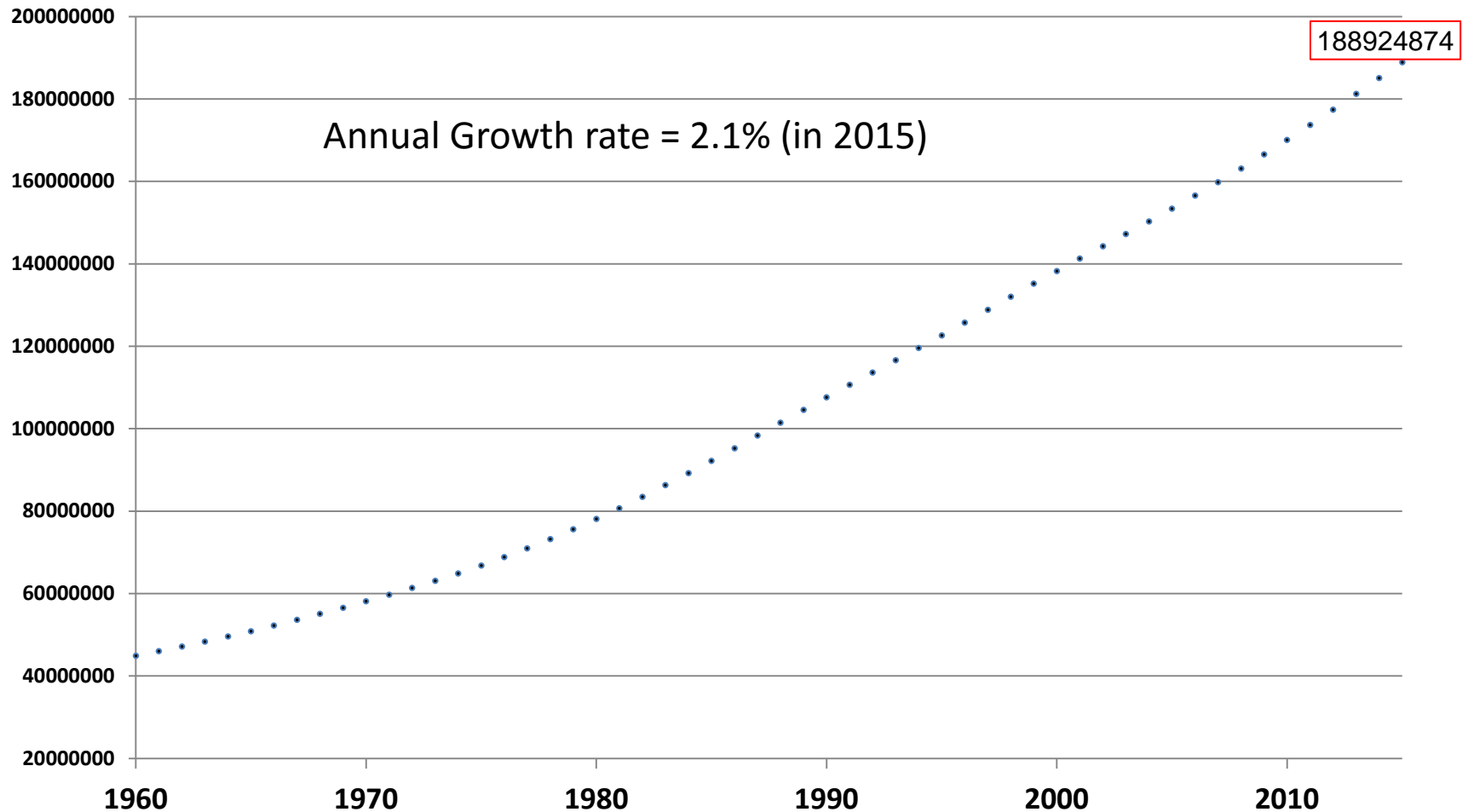
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PAKISTAN ON WORLD MAP

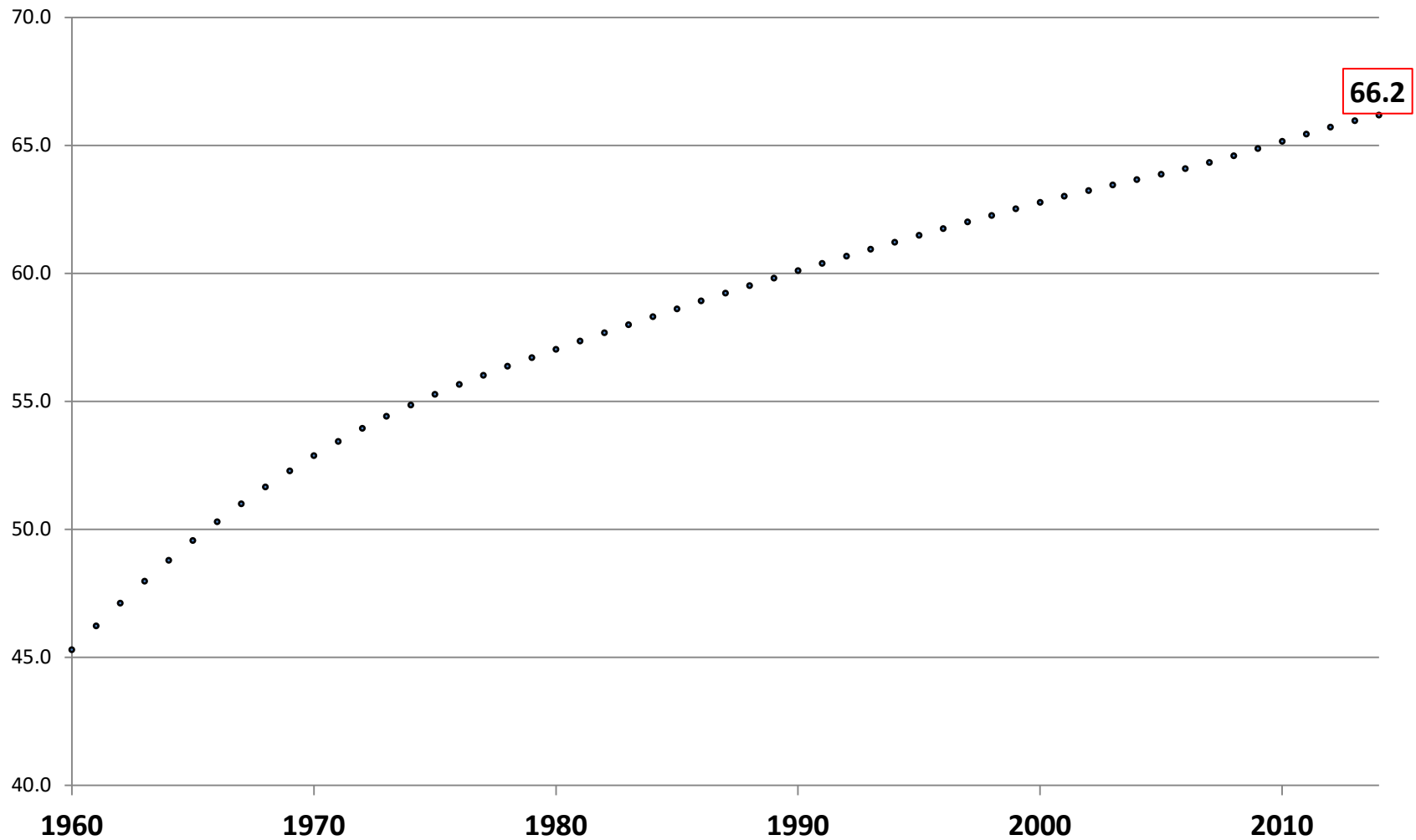


TOTAL POPULATION (1960-2015)



Source: World Bank country profile

LIFE EXPECTANCY AT BIRTH (YEARS)



Source: World Bank country profile

HEALTHCARE FACILITIES

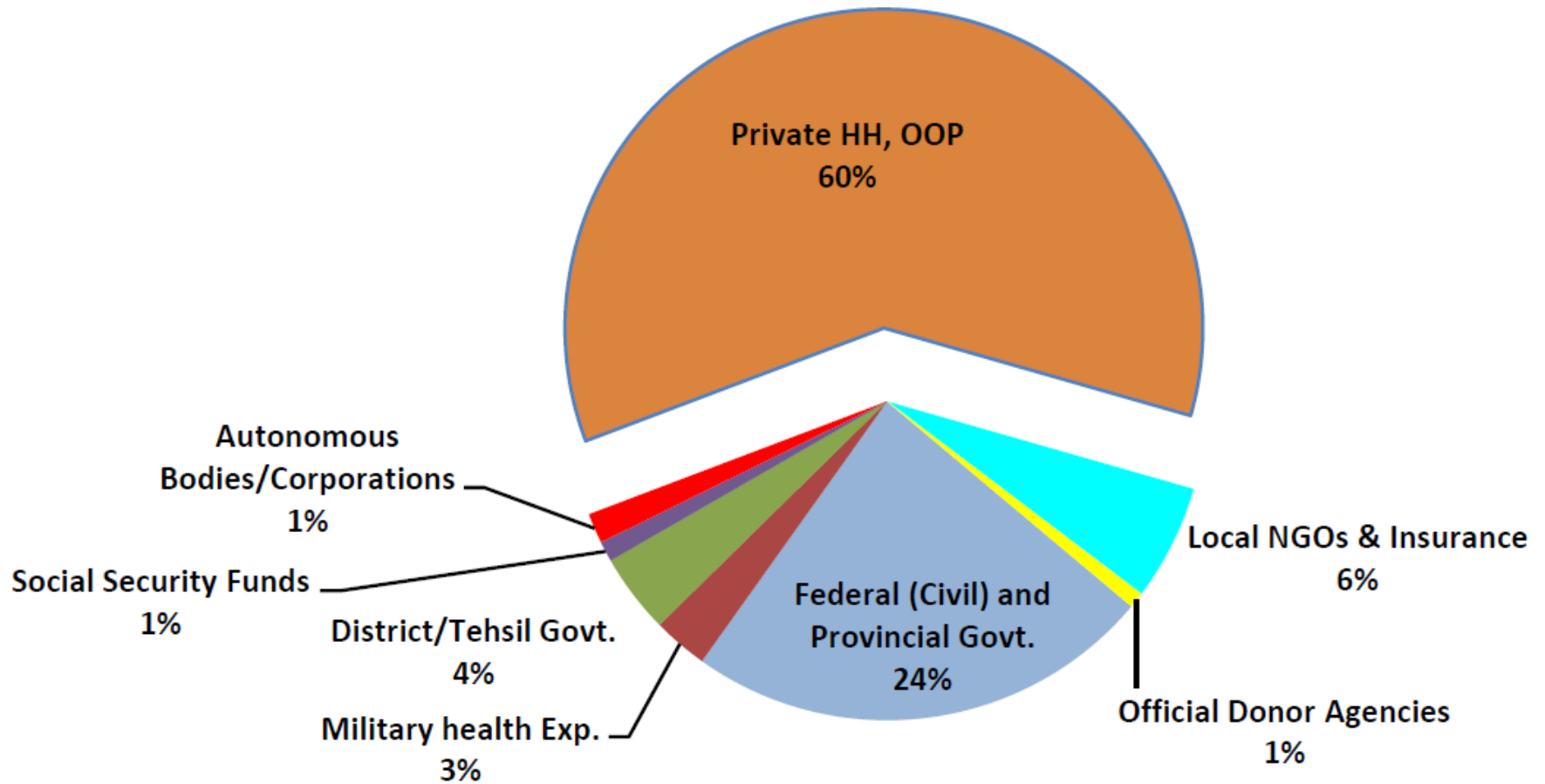
Health Manpower	2011-12	2012-13	2013-14	2014-15	2015-16
Registered Doctors	152,368	160,880	167,759	175,223	184,711
Registered Dentists	11,649	12,692	13,716	15,106	16,652
Registered Nurses	77,683	82,119	86,183	90,276	94,766
Population per Doctor	1,162	1,123	1,099	1,073	1,038
Population per Dentist	15,203	14,238	13,441	12,447	11,513
Population per Bed	1,647	1,616	1,557	1,591	1,613

Source: Pakistan Bureau of statistics

PER CAPITA HEALTH EXPENDITURE

- The annual per capita health expenditures for Pakistan as of 2013-14 are 39.5 US\$.
- For comparison, the respective figures for year 2013-14 reported to WHO by Sri Lanka, India and Bangladesh are 127, 75 and 31 US\$, respectively.

CONTRIBUTORS IN HEALTH EXPENDITURE



Source: National Health Accounts, 2013-14

HISTORY OF HSCT IN PAKISTAN

1978-1991

- Strengthening of Transfusion Services
- Establishment of HLA Typing facility
- Strengthening Radiotherapy and Oncology

1992-1997

- Construction work in 1993 Armed Forces BMT centre
- Human resource development
(BMT training of 3x consultants, 3x nurses)
- 1st AUTOPBSC TRANSPLANT- October 1995
ZIAUDDIN HOSPITAL KARACHI
Khalid Zafar Hashmi & Tahir Sultan shamsi

Armed Forces Bone Marrow Transplant Centre (AFBMTC)

Laying Foundation Stone - 1993



Inauguration - 2001



1st ALLOGENEIC PBSC TRANSPLANT 1999

National Institute of Blood Diseases (NIBD)



TRANSPLANT CENTRES IN PAKISTAN



- NIBD, Khi (1999)
- AFBMTC, Rwp (2001)
- AKUH, Khi (2004)
- SKMCH, Lhr (2009)
- PIMS, Isb (2009)
- SIH, Isb (2009)
- KC, Rwp (2014)
- NIBD-NH, Lhr (2016)

ISSUES

- Lack of national transplant registry and marrow donor registry
- Inadequate advanced diagnostic facilities
- Non-availability of chemotherapeutic agents/antibodies
- Inadequate social security support
- Low number of transplant centers

TRANSPLANT ACTIVITY IN PAKISTAN

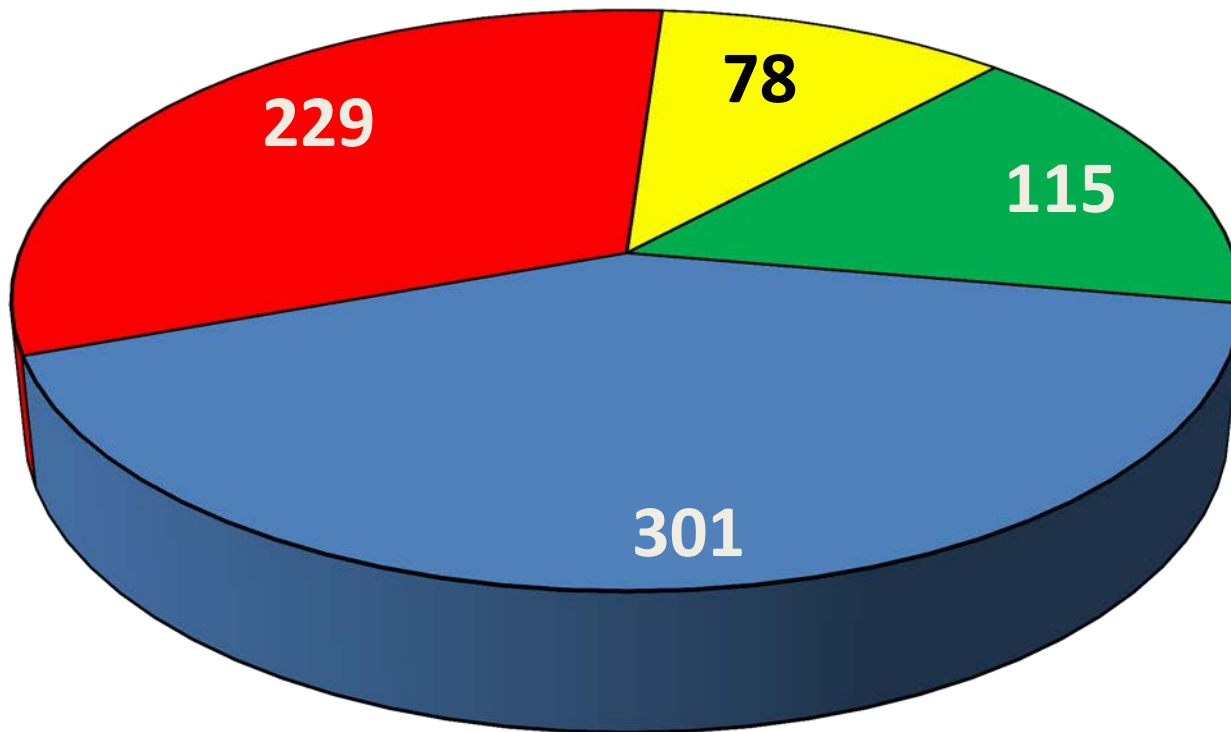
	AFBMTC	NIBD & BMT	AKUH	PIMS	SIH	Total
Total transplants	779	611	257	120	78	1845
Allogeneic	723	540	165	120	41	1589
Autologous	56	71	92	0	37	256
Haplo-identical	7	25	3	-	-	35
Bone marrow stem cells	387	142	22	120	-	671
PBSC	227	411	92	-	78	808
Mixed and unknown	165	58	54	-	-	

MAJOR INDICATIONS FOR TRANSPLANT IN PAKISTAN

Indication for Transplant	TOTAL	AFBMTCC	NIBD & BMT	AKUH	PIMS	SIH
Total Allogeneic	1589	723	540	165	120	41
Thalassaemia major	603	229	242	30	100	2
Aplastic anemia	540	301	156	58	20	5
Acute leukemia	169	52	47	43	-	27
Total Autologous	256	56	71	92	0	37
Lymphomas	155	25	42	68	-	20
Multiple Myeloma	67	21	14	19	-	13
AML	19	6	13	-	-	-

ALLOGENEIC HSCT-AFBMTC

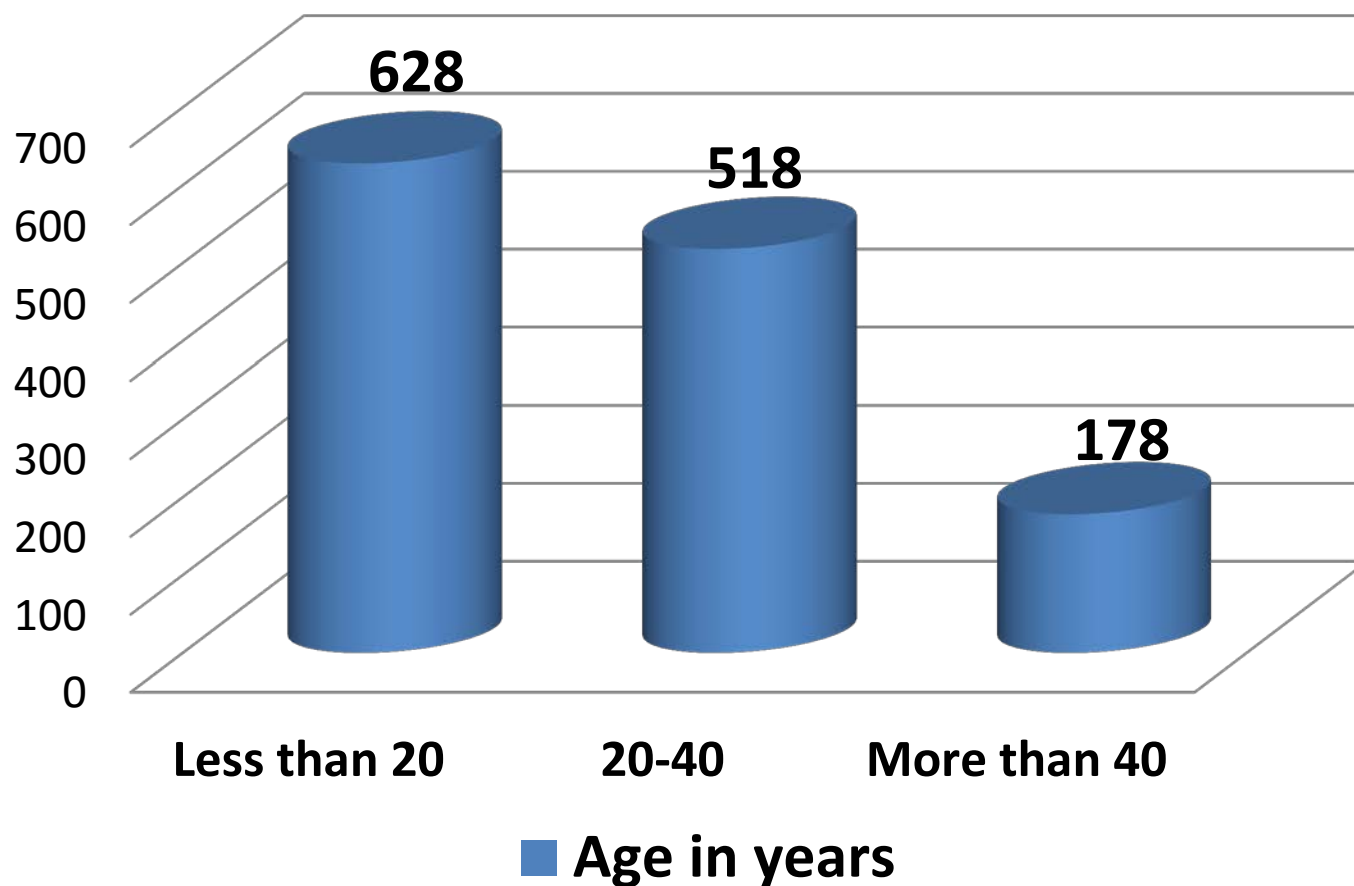
n = 723



■ Aplastic Anaemia ■ Beta Thalassaemia ■ CML ■ Misc

Aplastic Anaemia in Pakistan

AFBMTC Data- Age distribution (n=1324)

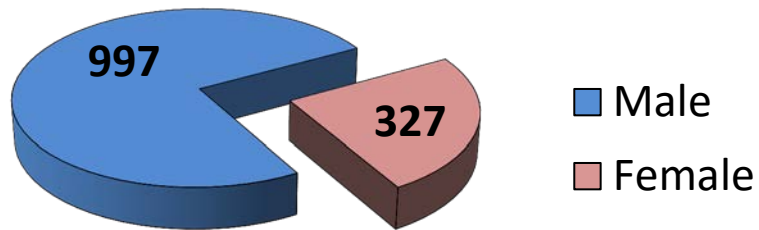


AFBMTC data

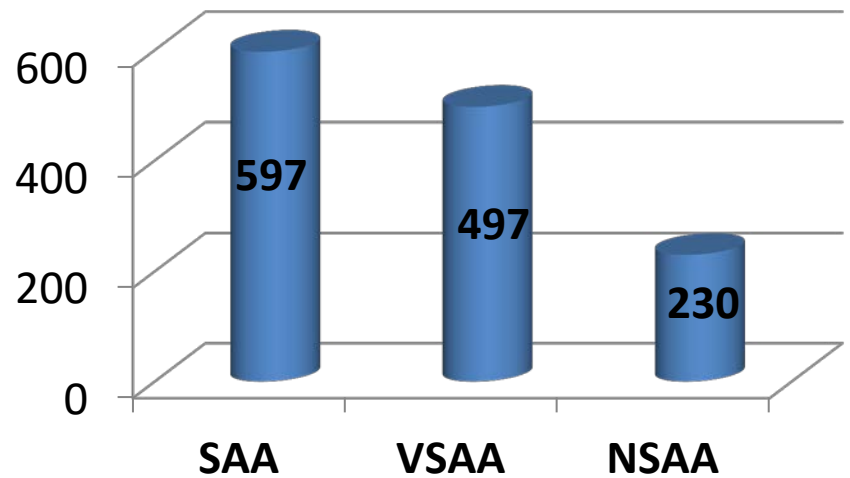
PATIENTS' CHARACTERISTICS

n= 1324

Gender



Disease Severity



AFBMTC data

Aplastic Anemia: Treatment Outcome

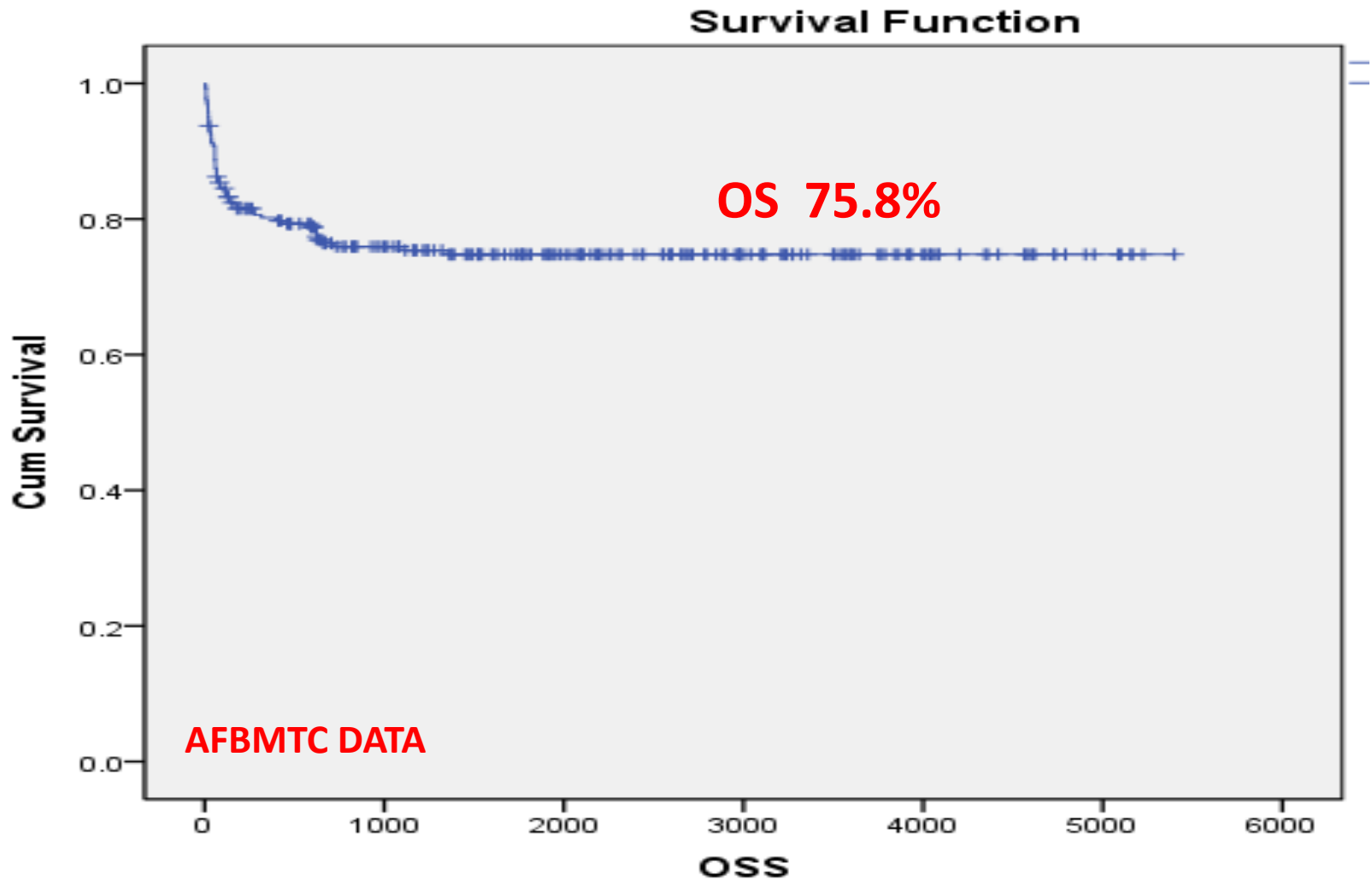
(n=828)

Treatment	Total	Alive N(%)	Dead N(%)
Allo HSCT	298	202 (68%)	96 (32%)
CSA±Steroids	429	167 (39%)	262 (61%)
ATG/ALG	101	35 (34.6%)	66 (65.4%)

AFBMTC data

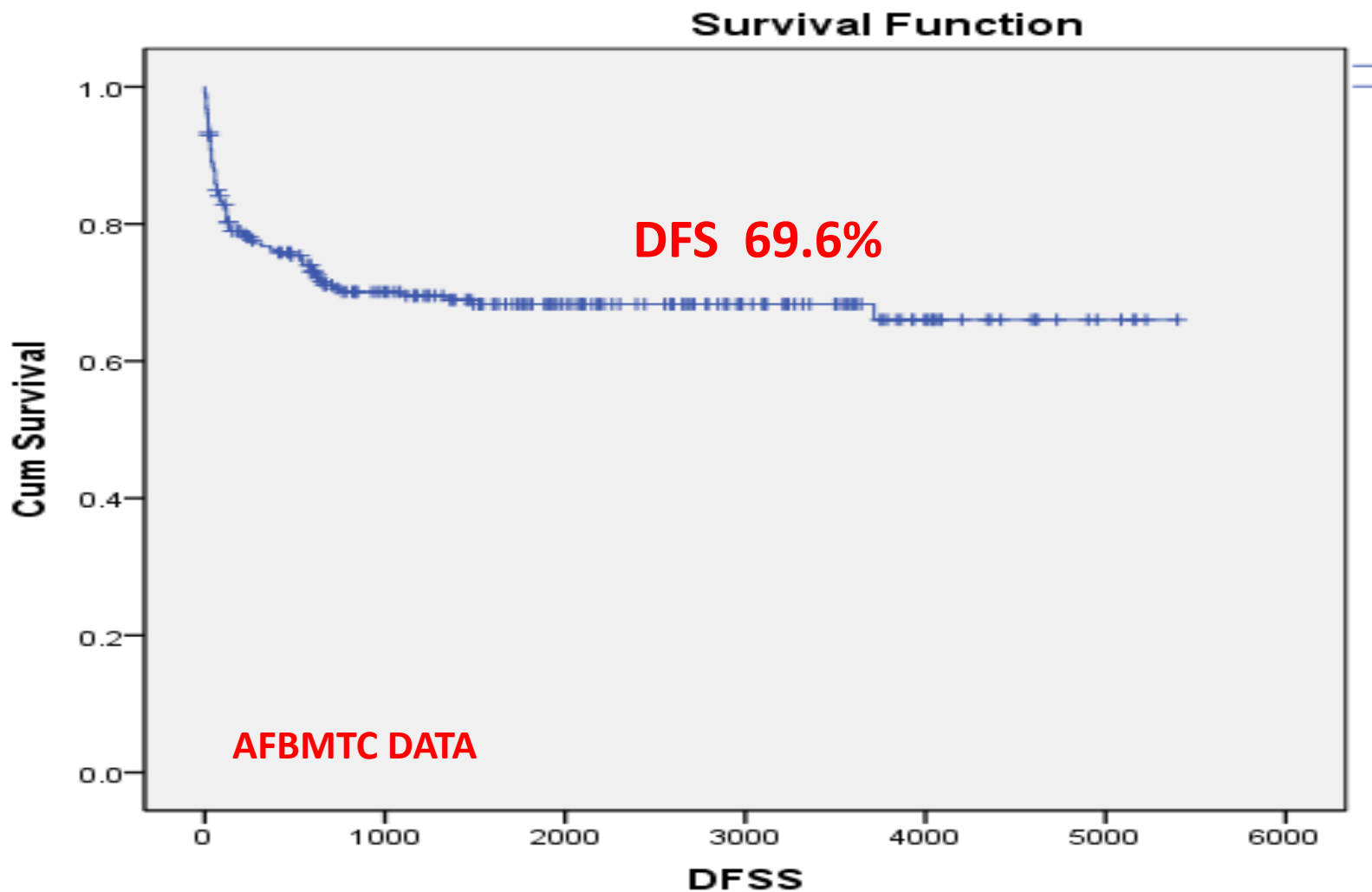
OS IN APLASTIC ANAEMIA

(Data of 240 consecutive first HSCT)



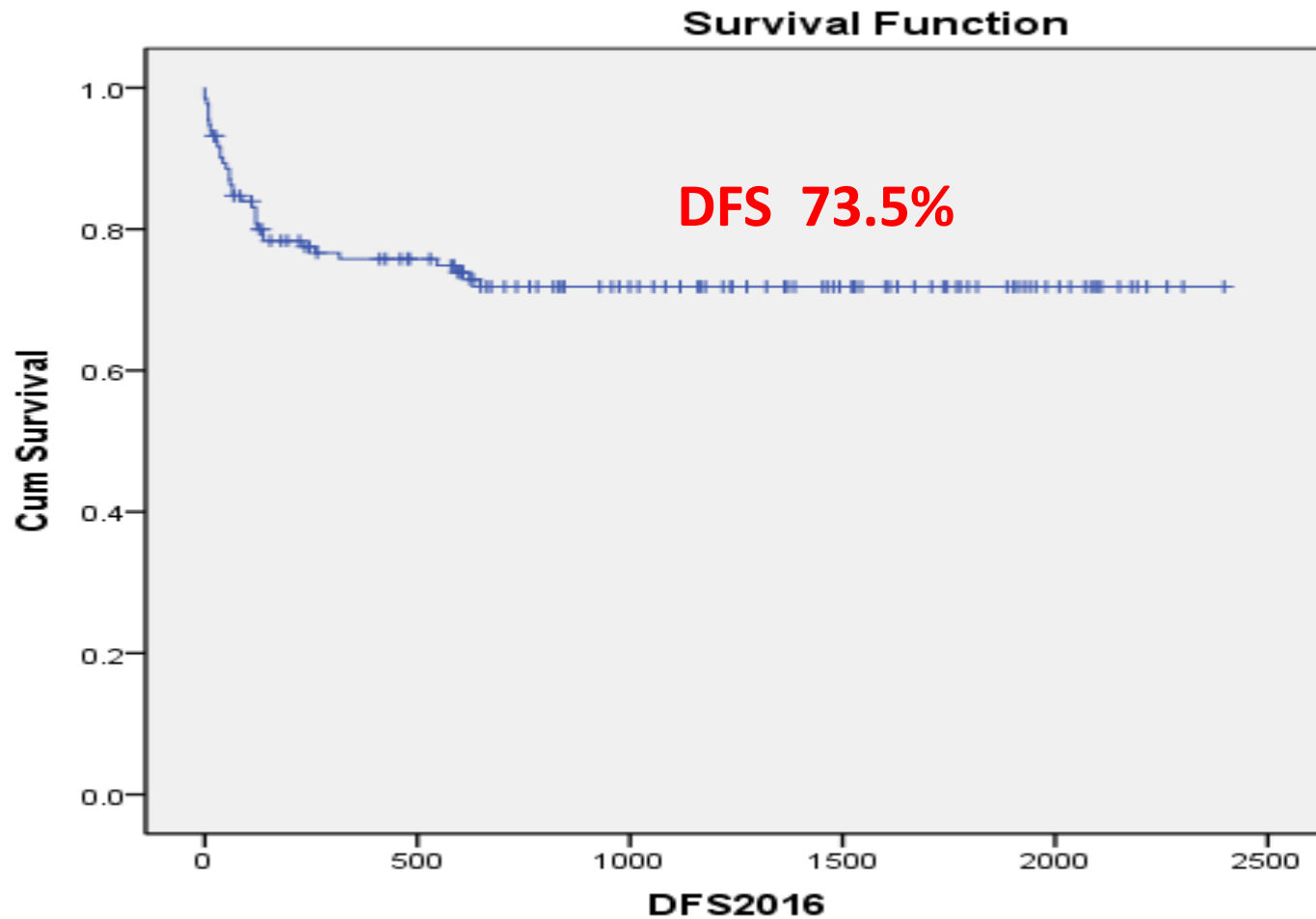
DFS IN APLASTIC ANAEMIA

(n=240)



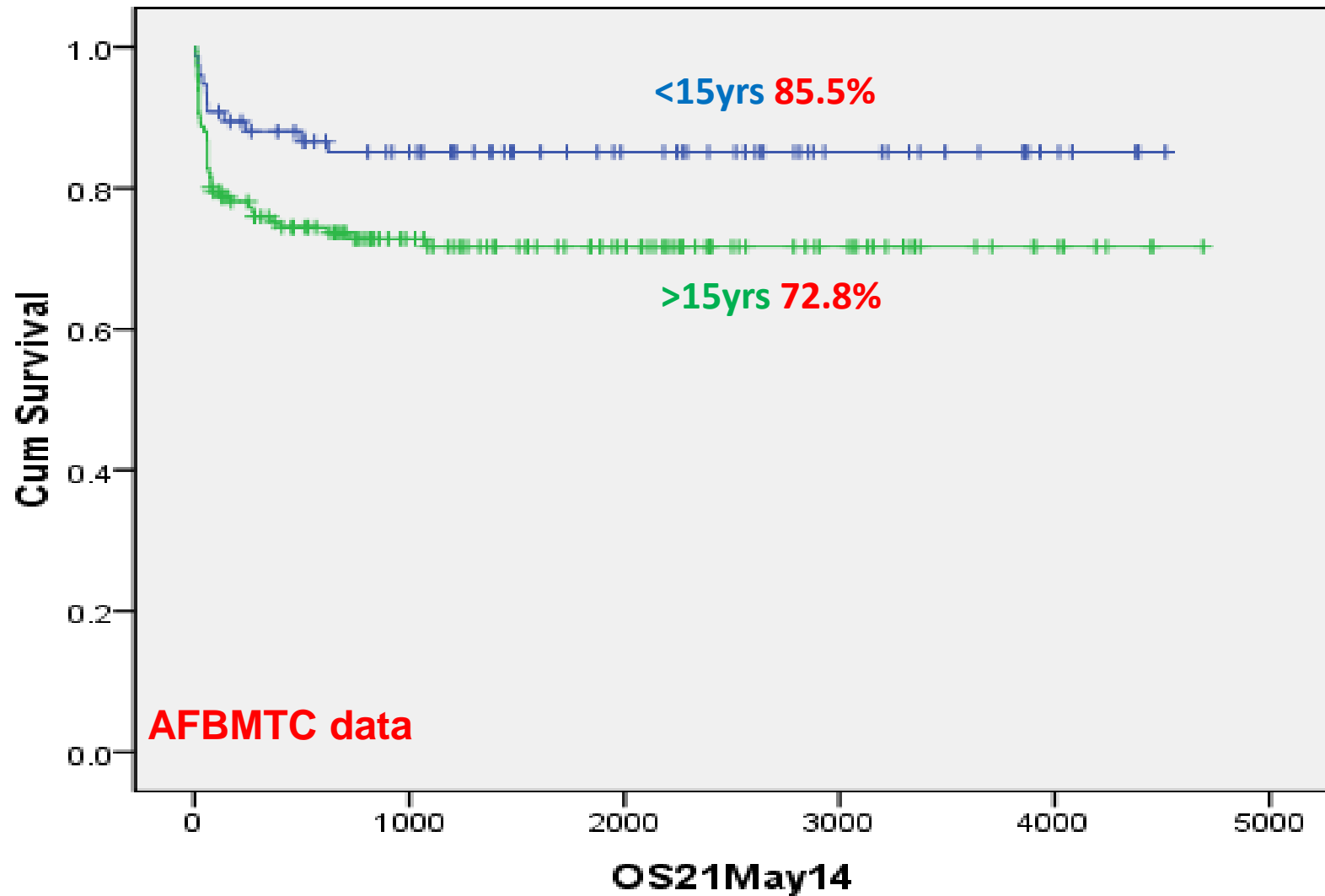
DFS (Sep 2009 till 2016)

n=132



OS

(<15 Yrs vs >15 Yrs)

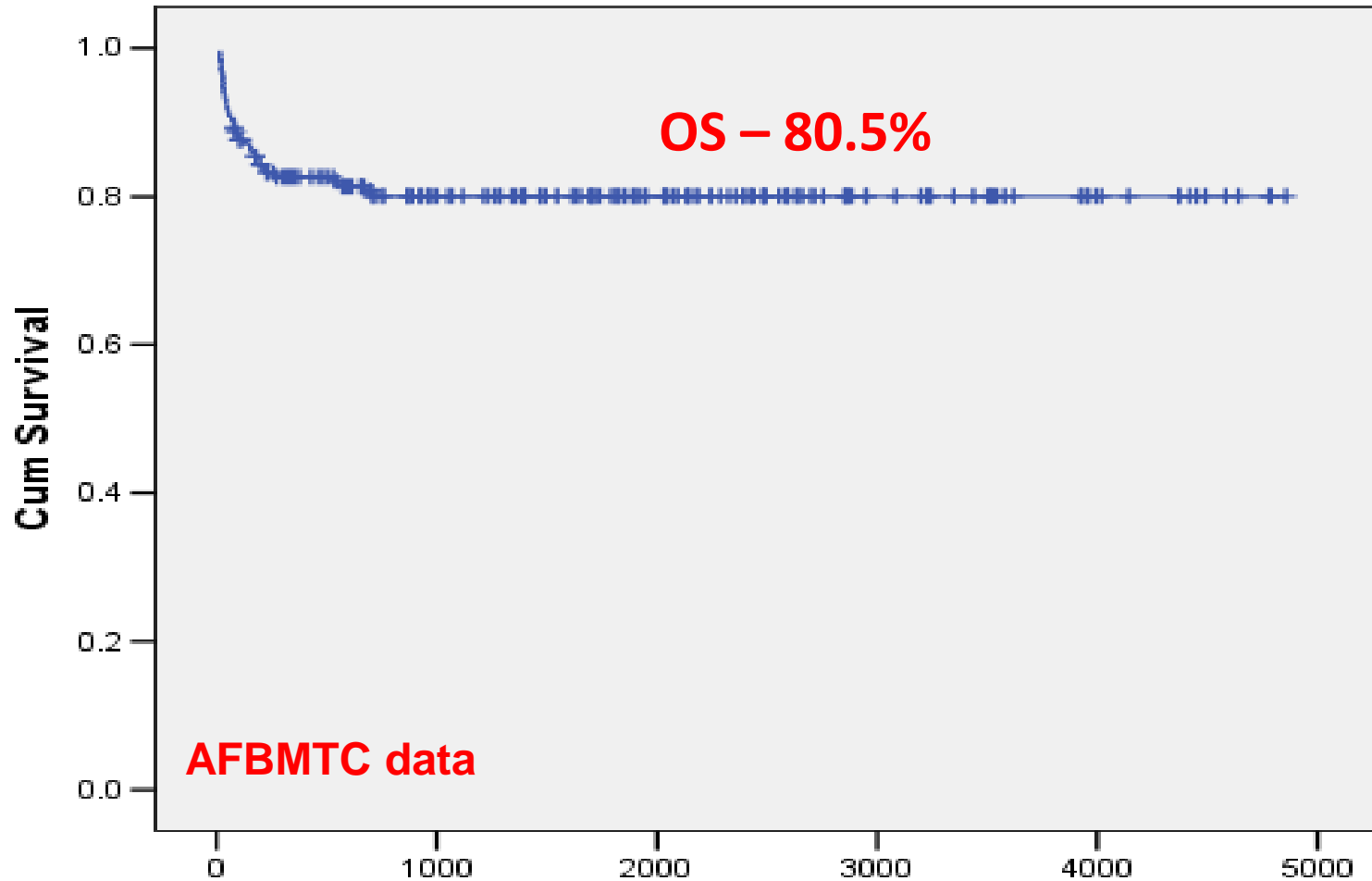


BETA THALASSEMIA IN PAKISTAN

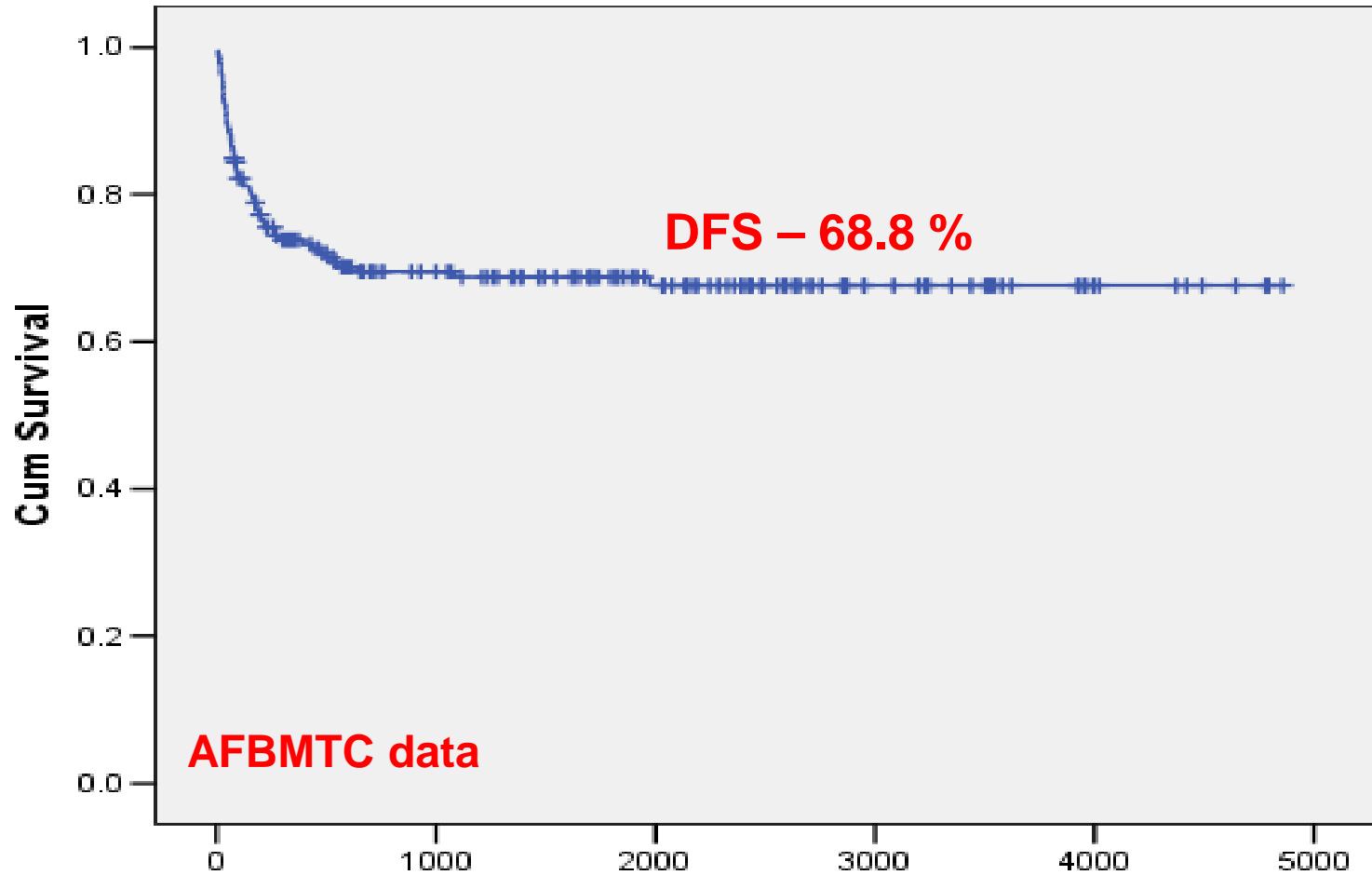
- Thalassemia carriers (as % of population) **5%**
- Total Carriers **8 million**
- Thalassemia births/year **5,000 – 6,000**
- Thalassemia Major prevalence **~ 60,000**

OS IN BETA THALASSEMIA-2001-2016

(n=220)

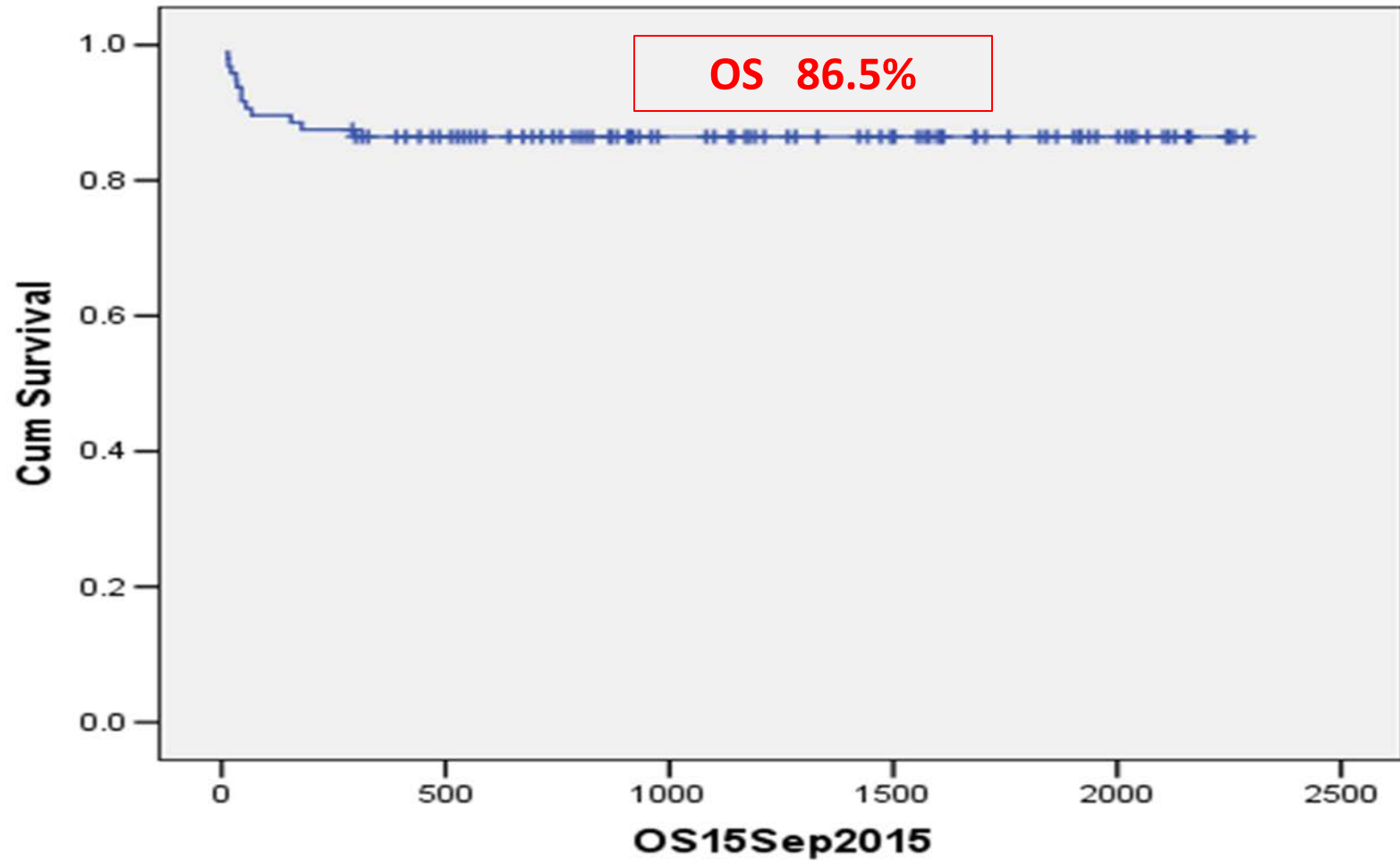


DFS IN BETA THALASSEMIA-2001-2016



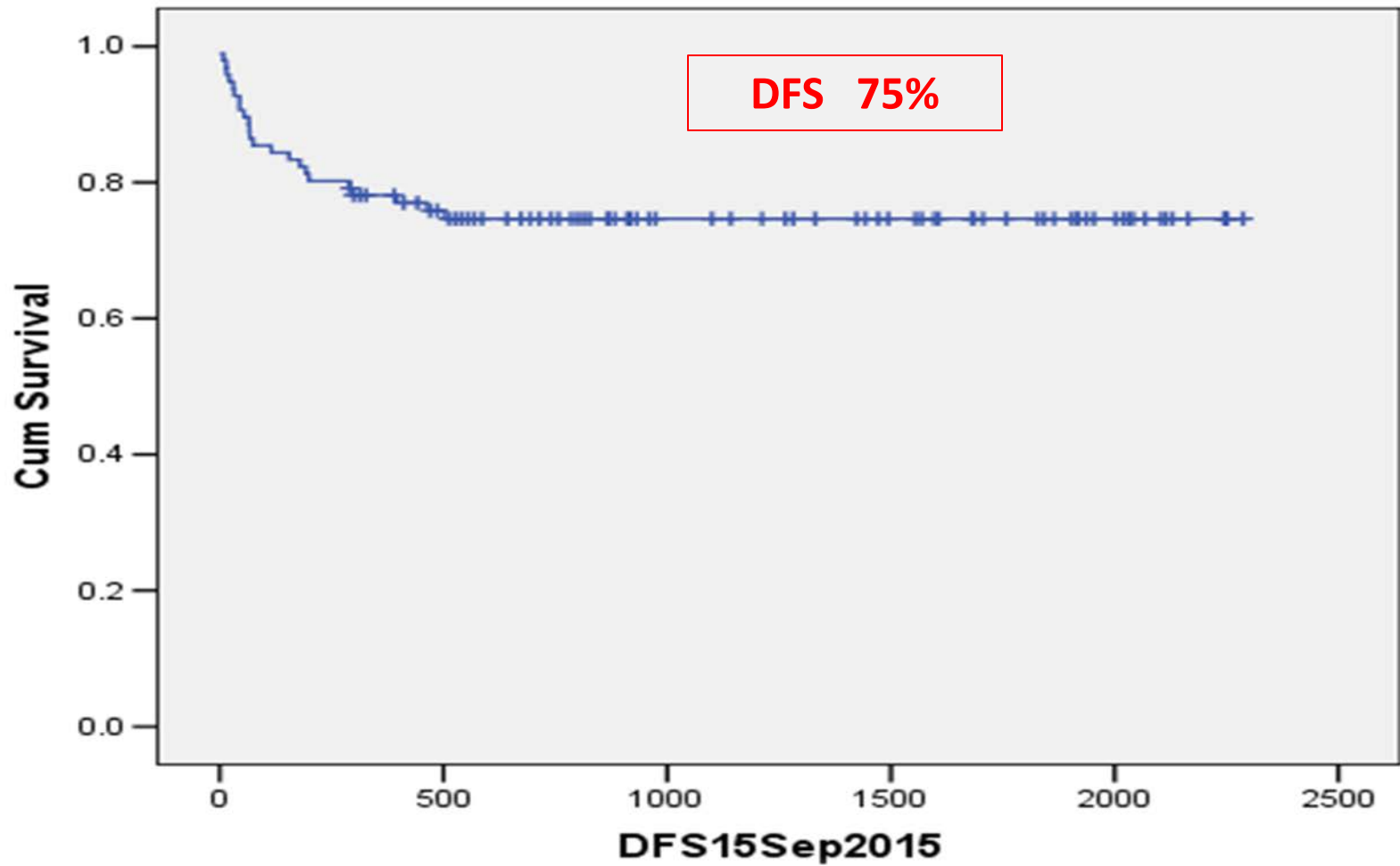
OS since Sep 2009

(n=96)



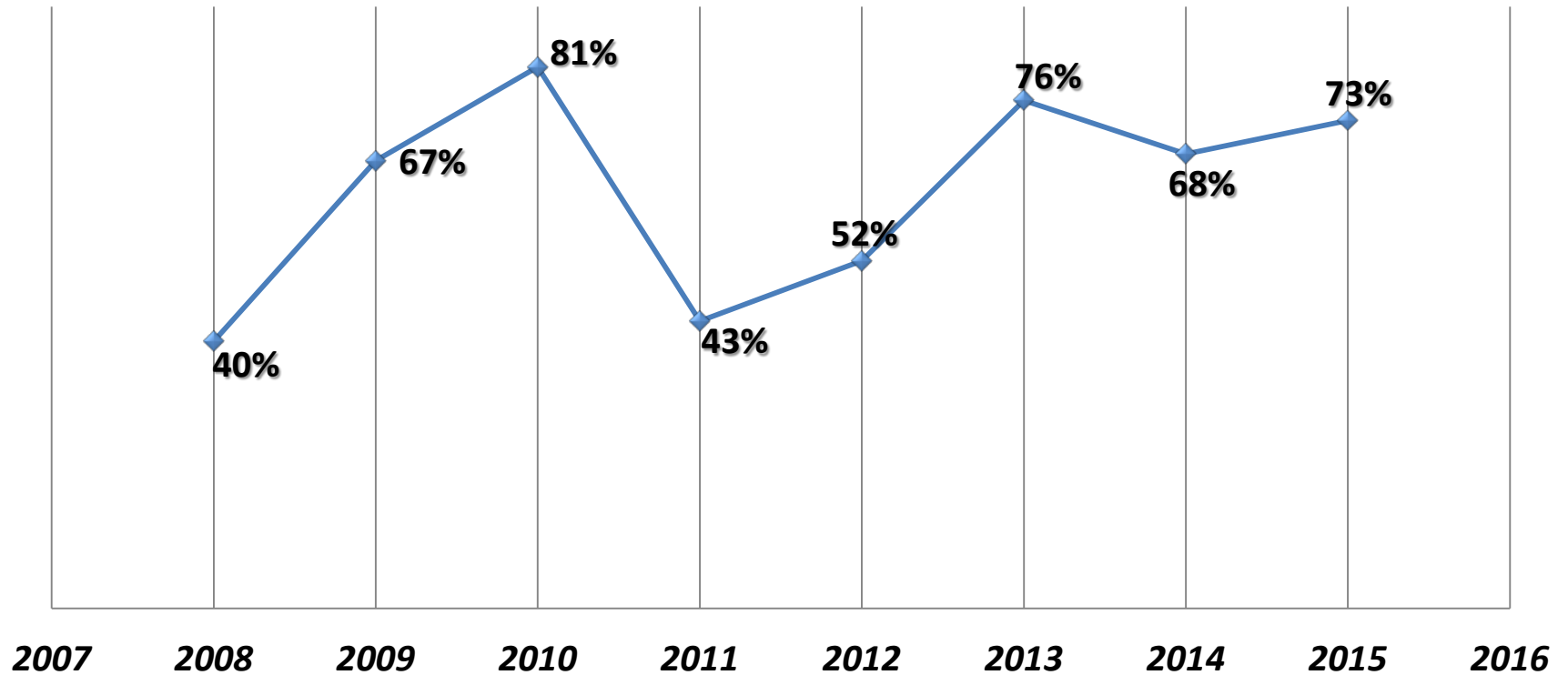
DFS since 2009

(n=96)



OUTCOME OF PAEDIATRIC BMT AT NIBD KARACHI

OVERALL SURVIVAL 2008-2015



CONCLUSION

- Hematopoietic Stem cell transplant activity in Pakistan has progressed during last 2 decades, though at very low rate.
- Sub-optimal availability of advanced diagnostics, chemotherapeutic and biological agents and poor economic conditions are major constraints
- There is lack of transplant and national donor registry as well as effective preventive programs for common genetic diseases like thalassemia

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