

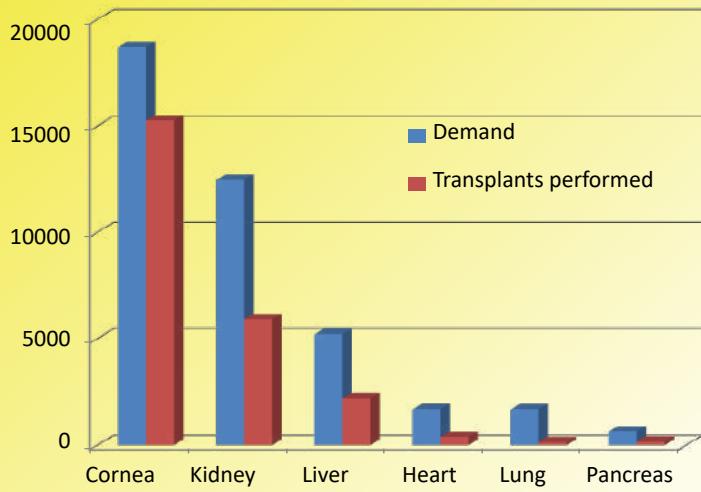
2018

Organ Transplantation in Brazil

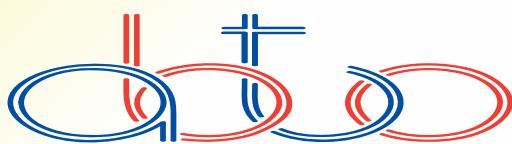
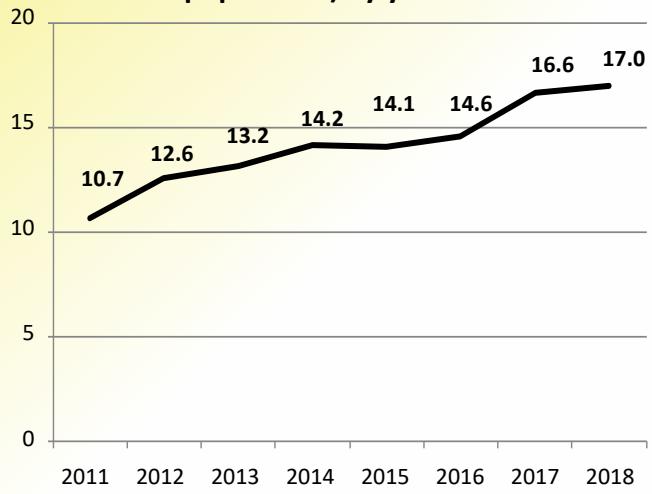
(2011-2018)

In absolute numbers Brazil holds the second largest kidney and liver transplant programs in the world. However, organ donation and the allocation systems still have to improve and there are regional disparities to be solved. The population trust in organ donation and fairness of the system, along with government and medical societies support, as much as the dedication of health care professionals, are of utmost importance for the success of the Brazilian Transplantation Program.

Estimated demand and number of transplants performed in Brazil in 2018



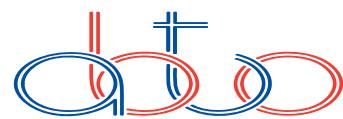
Effective donors in Brazil - pmp (per million population) by year



RBT

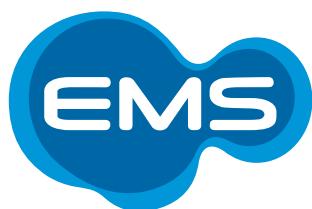
Brazilian Transplantation Registry

Official report of Brazilian Organ Transplantation Society



Associação Brasileira de Transplante de Órgãos

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A hard year,

In 2018, the effective donor rate grew by only 2.4% from 16.6 PMP in 2017 to 17.0 PMP in 2018, 5.5% below the expected rate (18.0 PMP). This increment was due to a 0.6% increase in the potential donor's notification rate and a 2.2% increase in the donation rate. However, the deceased donor's organ transplants rate increased by only 0.7%, from 41.0 PMP to 41.3 PMP, revealing an increase in the rate of deceased donor organs non-use. Outstanding donation rates of deceased donors, higher than 40 PMP, were achieved in Paraná (47.7 PMP) and Santa Catarina (41.0 PMP) states, Parana state showed a notification rate of potential donors of 108 PMP, higher than its projected rate for the year (100 PMP). By the other side, no effective donors were obtained in Amapá state. The family refusal for donation remained at 43% varying between 27% in Parana state and 80% in Mato Grosso state. Overall brain trauma was the cause of brain death in 33% of the donors, and in three states (Maranhão, Ceará, and Para) more than 50% of the donors were reported with brain trauma.

Brazilian regions performed quite differently regarding organ donation. In the Southern region, a deceased donor rate of 35.9 PMP is more than twice than the Brazilian average (17.0 PMP). The North region, however, presented a rate of only donors 3.6 PMP almost five times lower than the Brazilian average.

The average cumulative rate of solid organ transplants (liver, heart, lung, kidney, and pancreas) reached 41.9 PMP, far below from the expected rate for 2021 (60 PMP), Parana (90.9 PMP), Pernambuco (69.2 PMP) and São Paulo (67.4 PMP) were the leading states.

The kidney transplant rate has remained unchanged at 28.5 PMP over the past six years. Over this period a 32.9% drop in living donor transplants and a 10.3% increment in deceased donor transplantation was observed. The rate of unrelated has remained stable at around 6% of the living-donor transplants. Only the Paraná state performed more than 50 PMP renal transplants. Several factors can be implicated in this stagnation, such as the fact that six states are practically not performing kidney transplants and, mainly, because transplant teams are not growing, and some of them are losing members most possibly due to long-lasting economic hurdles.

Liver transplantation rate increased by 15.4% in the last six years, in 2018 7.6% were performed with living donors, Distrito Federal, Paraná and Ceará states performed more than 20 PMP liver transplants.

In the last six years, cardiac transplantation increased 21.4%, from 1.4 PMP to 1.7 PMP, still far from the predicted need (8 PMP), Distrito Federal (11.2 PMP) and Pernambuco (4.4 PMP) presented the highest rates.

The rate of lung transplantation had a 50% increment between 2013 and 2018, moving from 0.4 PMP to 0.6 PMP, well below the estimated need (8 PMP) reflecting the need for more transplant teams in more Brazilian states. Only Rio Grande do Sul state (5.6 PMP) performed more than two PMP transplants.

The pancreas transplantation rate remained stable (0.7 PMP) in the six-year period. Only fifteen teams in eight states performed these transplants in 2018.

In São Paulo state, at Albert Einstein Hospital, four multi-visceral transplants were performed, which gives the hope that this transplants can finally consolidate in the country.

In summary, 2018 was a very difficult year as transplant hospitals and community struggled for adequate financial funding in order to provide a better service for the country. We are hopeful that the new Ministry of Health team will be sensitive to these claims in order to provide an adequate number of transplants and survival.

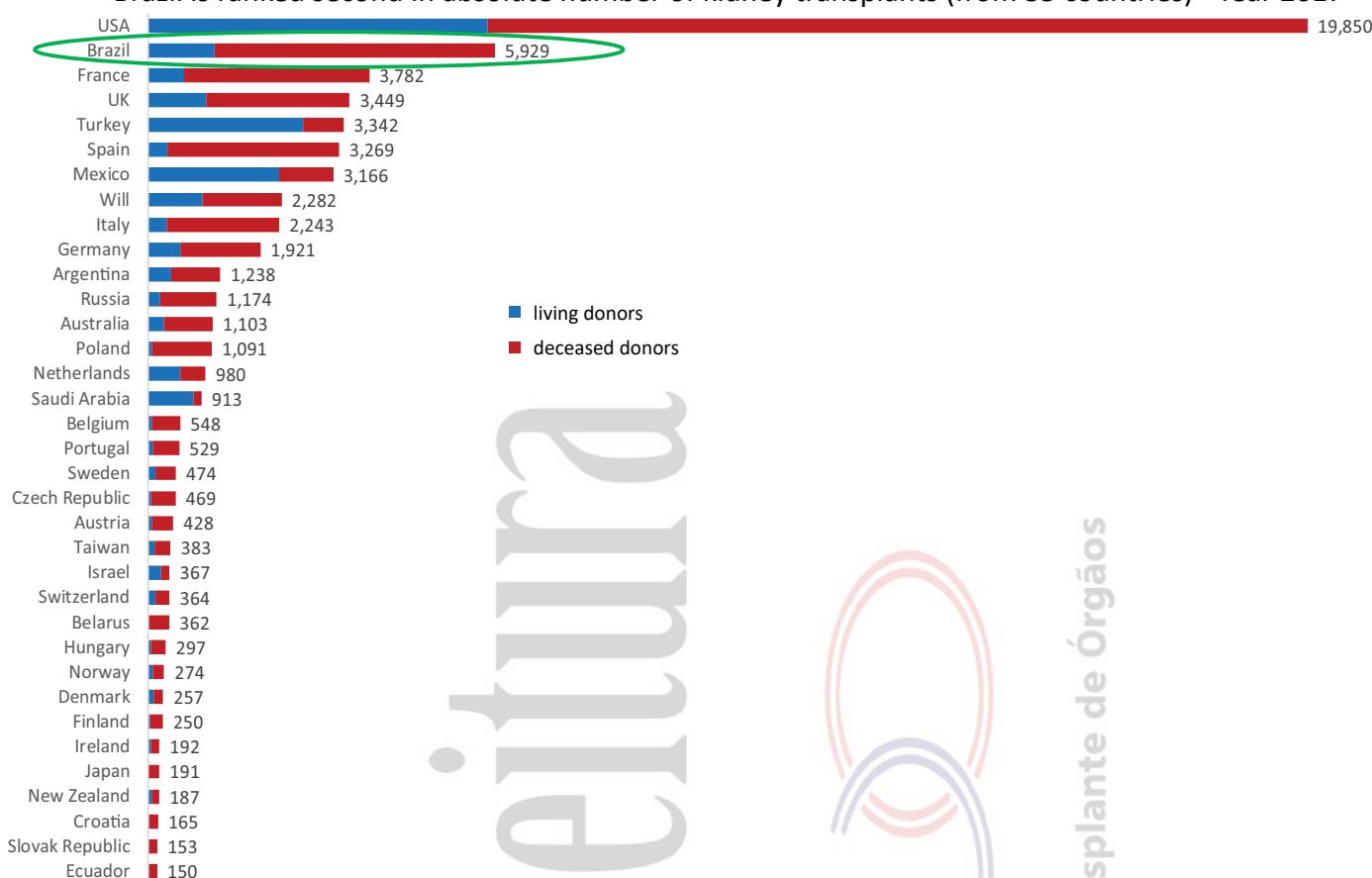
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BRAZILIAN STANDING IN GLOBAL FIGURES

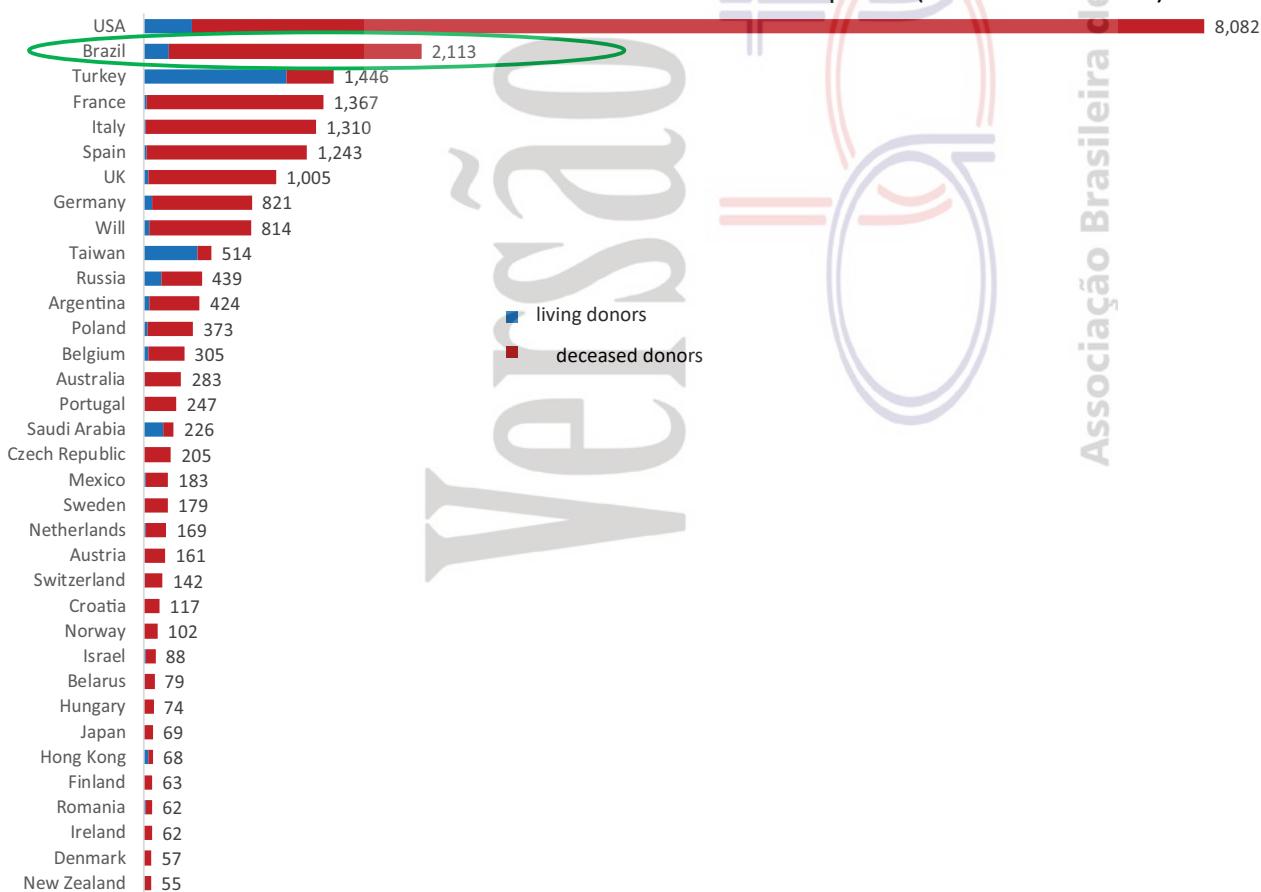
Source: IRODAT 2017

Brazil is ranked second in absolute number of kidney transplants (from 35 countries) - Year 2017



■ living donors
■ deceased donors

Brazil is ranked second in absolute number of liver transplants (from 35 countries) - Year 2017



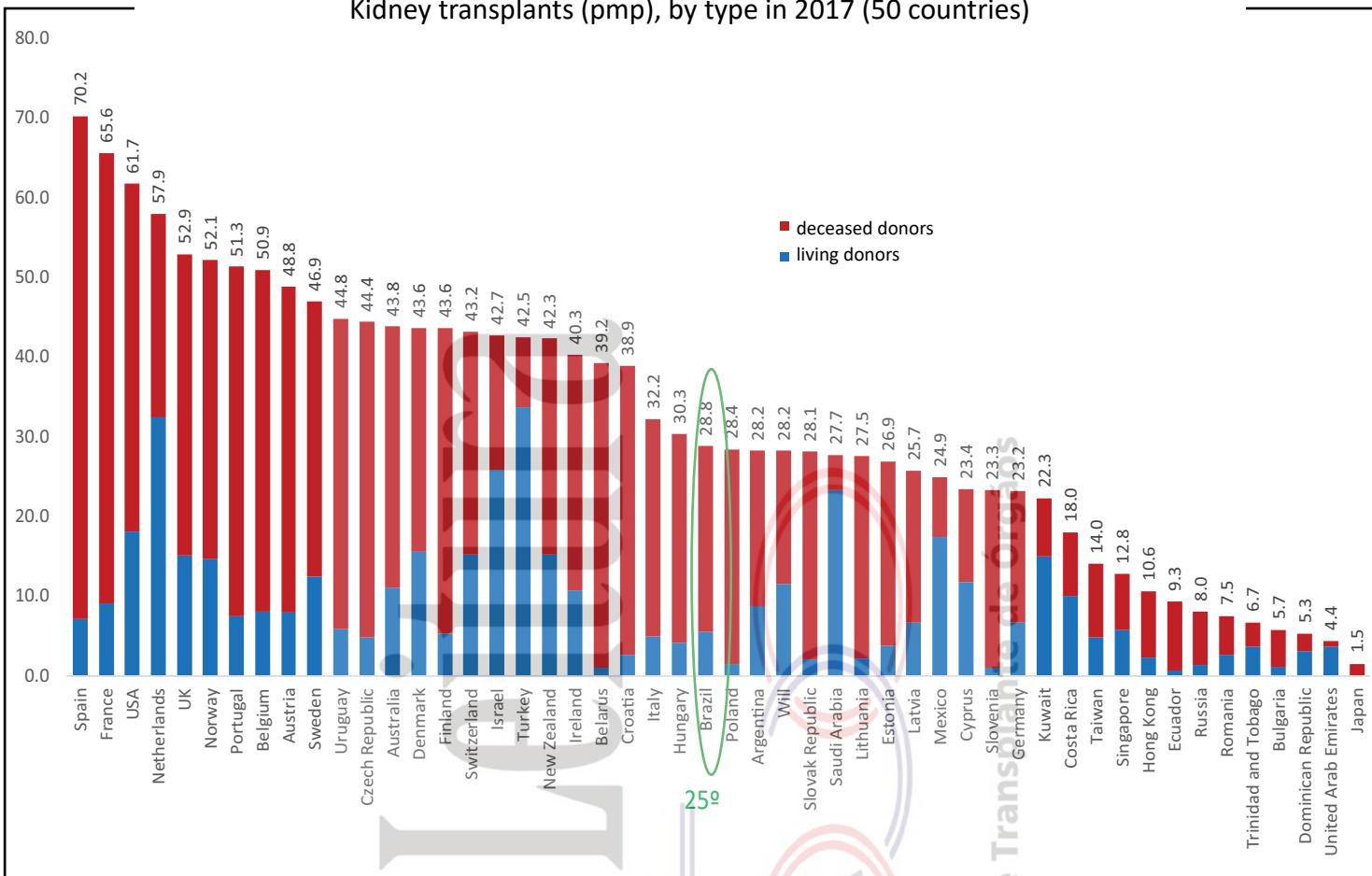
■ living donors
■ deceased donors

Versão 2018 (JAN/DEC) - ABTO
Associação Brasileira do Transplante de Órgãos

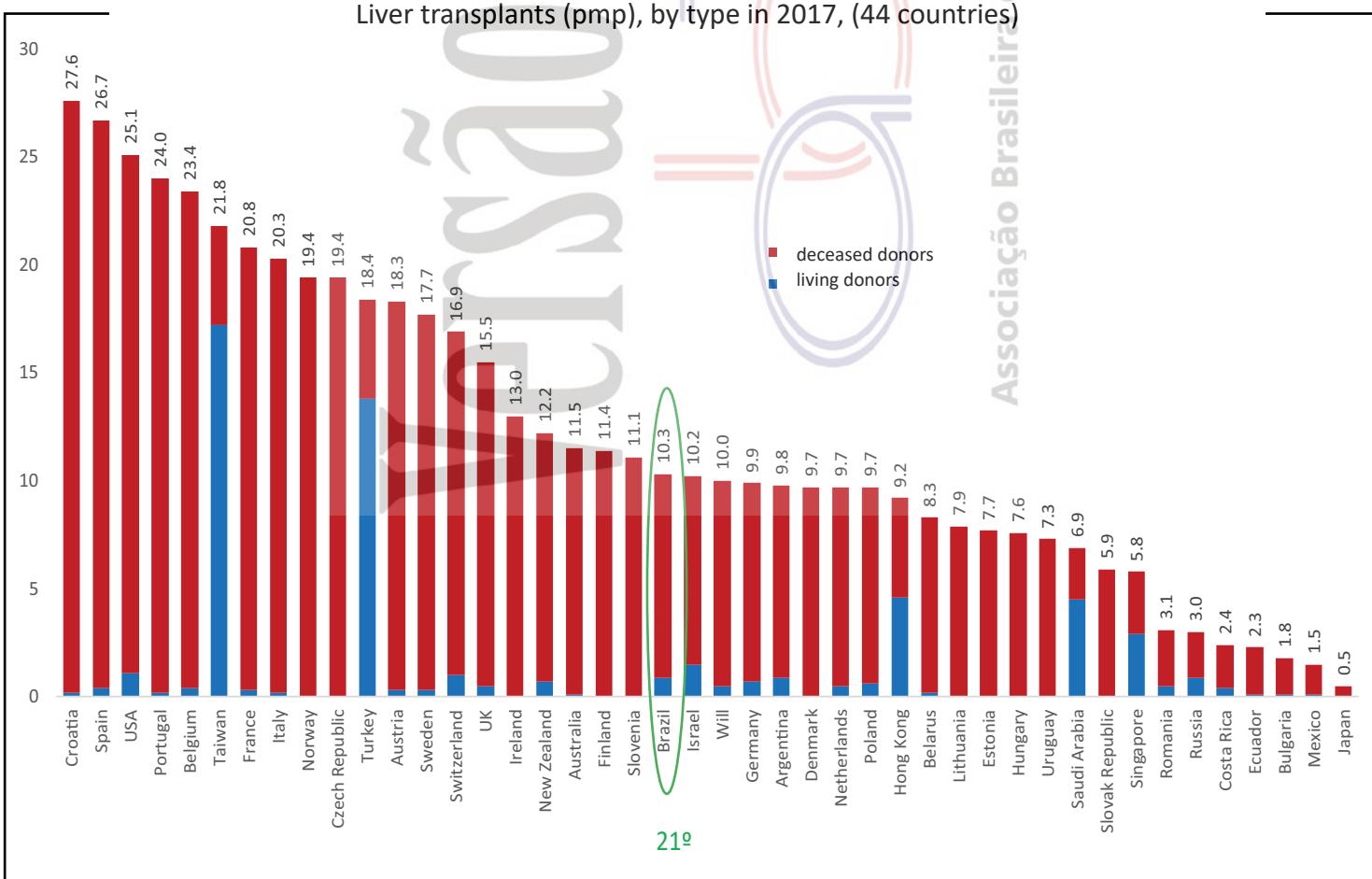
BRAZILIAN STANDING IN GLOBAL FIGURES

Source: IRODAT 2017

Kidney transplants (pmp), by type in 2017 (50 countries)



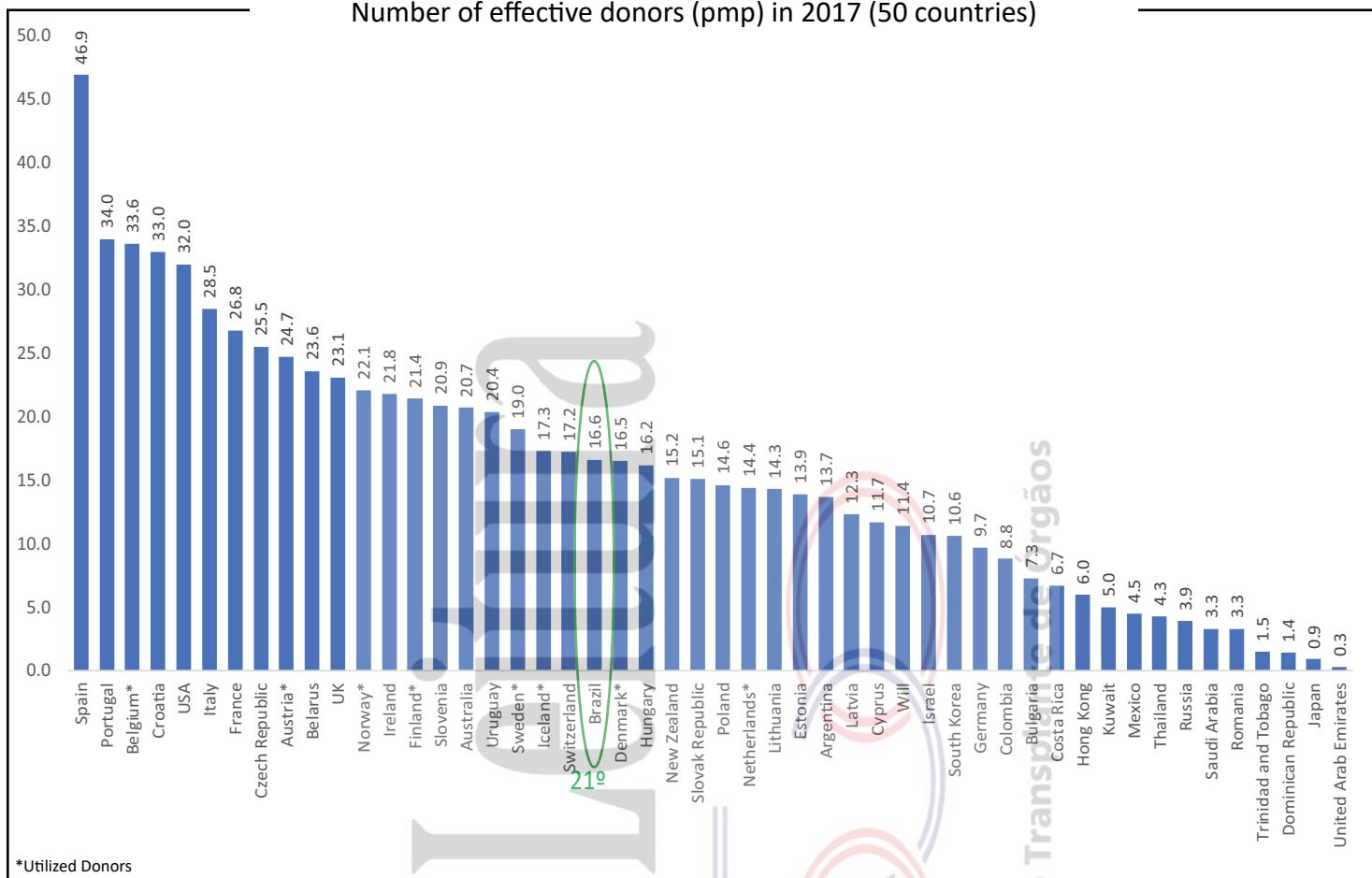
Liver transplants (pmp), by type in 2017, (44 countries)



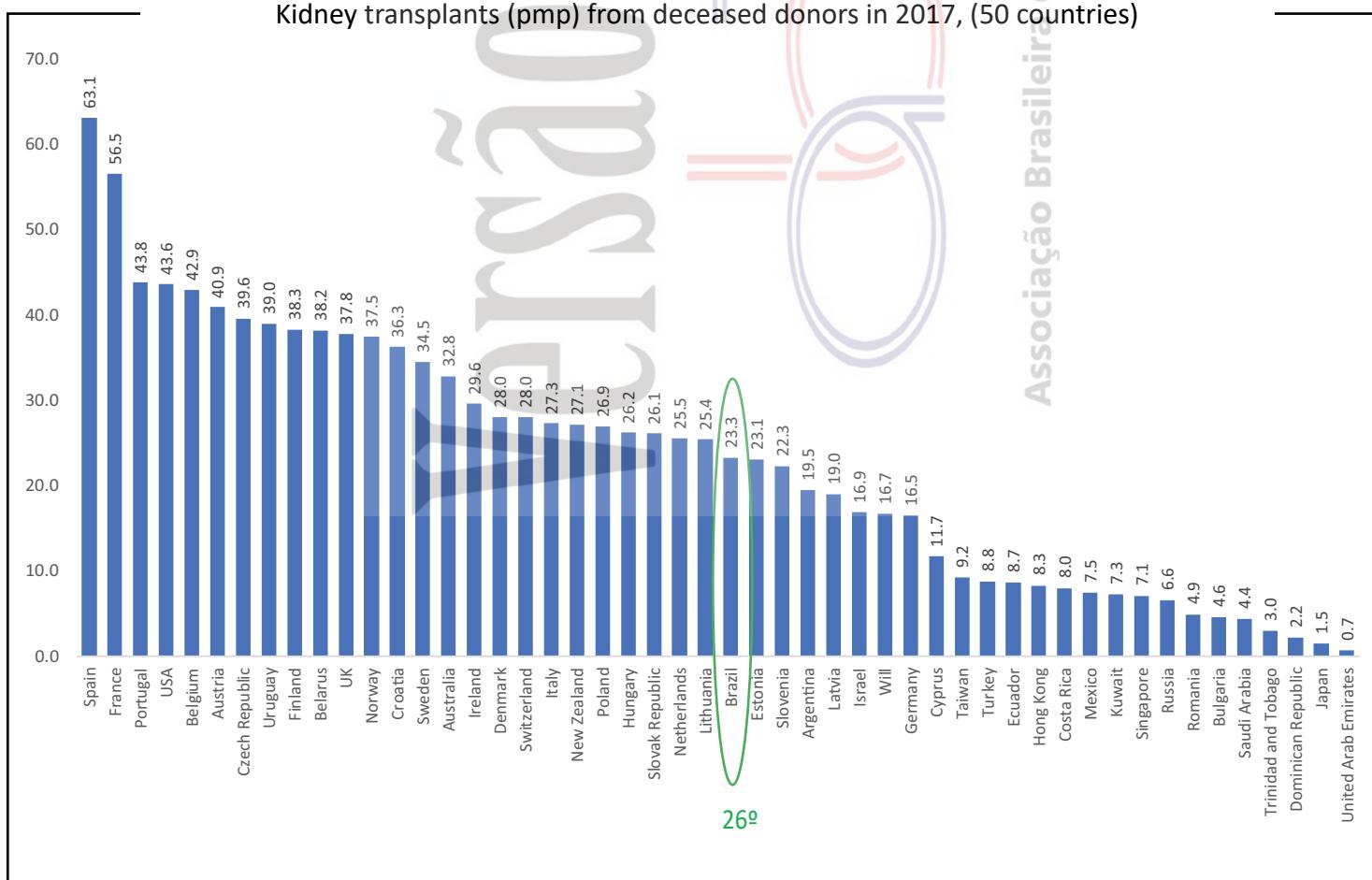
BRAZILIAN STANDING IN GLOBAL FIGURES

Source: IRODAT 2017

Number of effective donors (pmp) in 2017 (50 countries)



Kidney transplants (pmp) from deceased donors in 2017, (50 countries)



BRAZILIAN DATA

Population	207,660,92	Estimated annual need and number of transplants		Cornea	Kidney	Liver	Heart	Lung
		Estimated demand		18,689	12,460	5,192	1,661	1,661
		Transplants performed		14,809	5,923	2,182	353	121
Mortality per year	2011	2012	2013	2014	2015	2016	2017	2018
All causes	1,170,498	1,181,166	1,220,678	1,227,039	1,264,175	1,309,774	unavailable	unavailable
External causes	145,842	152,013	151,683	156,942	152,136	155,861	unavailable	unavailable
Neurological causes	26,948	28,712	30,300	32,381	34,721	36,870	unavailable	unavailable
Population (IBGE census)	190,755,799	190,755,799	190,755,799	190,755,799	202,768,562	204,450,649	206,081,432	207,660,920

Hospital

Total number	6,689
State capitals	1,585
Countryside	5,104
Nº de beds	467,222
Nº de ICU beds	44,218
Hospitals over 80 beds	1,761
Teaching hospitals	155
Medical schools	373
Neurosurgery services	473
Number of CIHDOTTS	548
Number of OPOs	58

Facts :

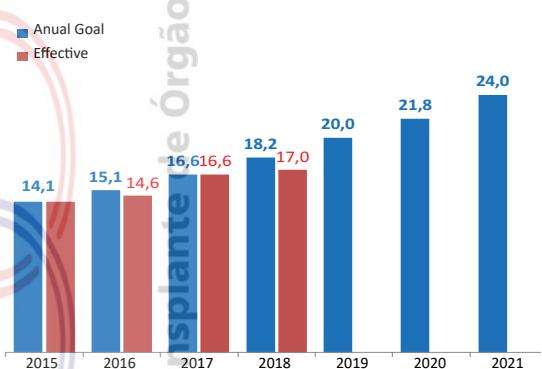
Positive:

- Well-established and consolidated transplant system,
- Program support by public governments,
- Better results being achieved overtime,

Negative:

- Slow increase in donation
- Elevated frequency of non-consenting family,
- Brain death notification below expected,
- Important disparities between states,
- Financial constraints for some programs,

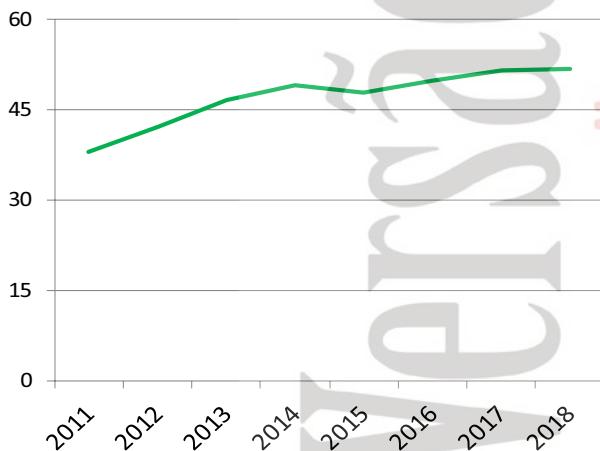
Annual goal of effective donors per million population



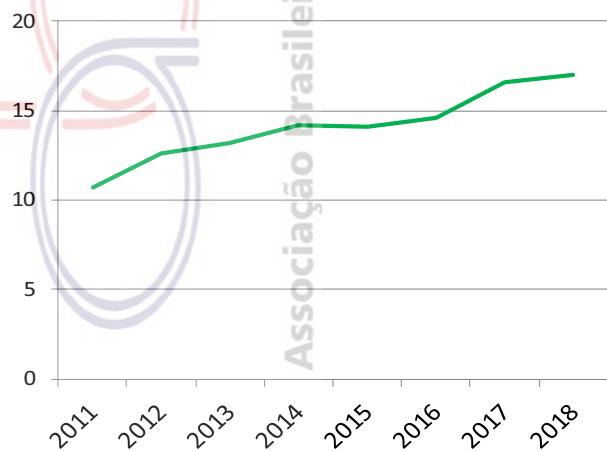
Source: <http://cnes.datasus.gov.br> 20/12/2017

Organ Donation

Notified potential donors - pmp



Effective donors - pmp

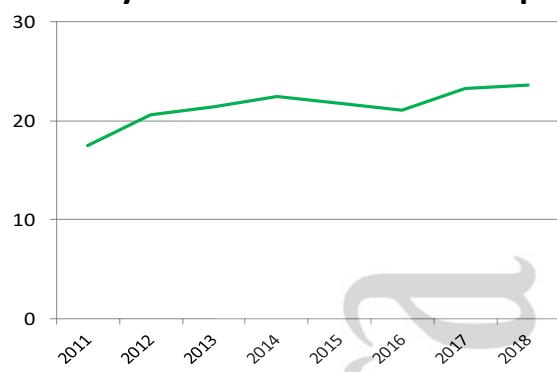


	2011	2012	2013	2014	2015	2016	2017	2018
Number of effective donors	2,048	2,406	2,526	2,713	2,854	2,981	3,415	3,531
Number of effective donors (pmp)	10.7	12.6	13.2	14.2	14.1	14.6	16.6	17.0
Potential donors	7,238	8,025	8,871	9,351	9,698	10,158	10,629	10,779
Number of potential donors (pmp)	37.9	42.1	46.5	49.0	47.8	49.7	51.6	51.9
Non consenting families	1,937	2,315	2,622	2,610	2,613	2,571	2,740	2,753
Refusal at interviews (%)	Unavailable	41%	47%	46%	44%	43%	42%	43%
Cardiopulmonary arrest	1,205	1,188	1,292	1,156	1,164	1,136	1,232	988
Contraindicação médica	832	836	1,150	1,349	1,416	1,594	1,559	1,545
Others	1,216	1,280	1,281	1,523	1,651	1,876	1,683	1,961

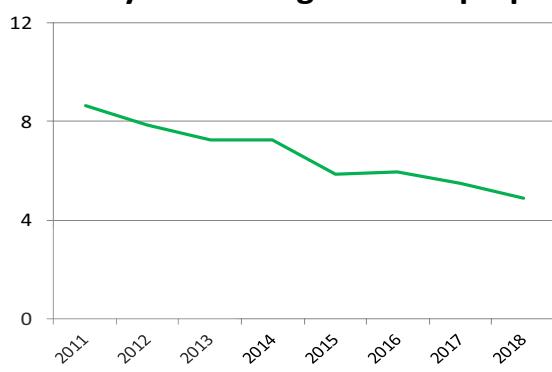
BRAZILIAN DATA

Organ Transplantation

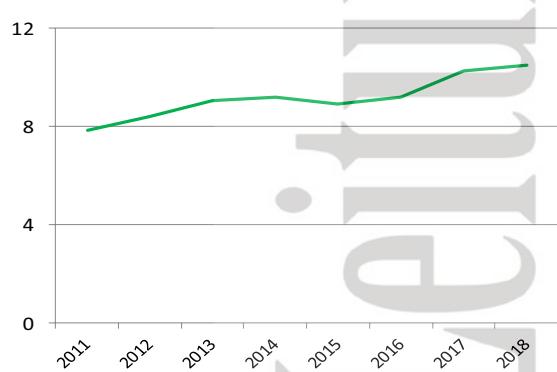
Kidney from deceased donors - pmp



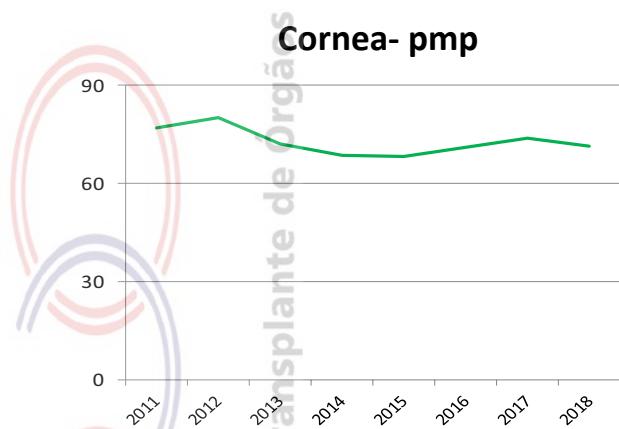
Kidney from living donors - pmp



Liver - pmp



Cornea- pmp



Number of teams performing transplants during the year

	2011	2012	2013	2014	2015	2016	2017	2018
Cornea	unavailable							
Kidney	126	124	129	135	131	129	131	136
Liver	57	59	60	64	62	62	69	75
Pancreas	26	19	21	15	16	16	16	15
Heart	27	27	33	31	33	31	36	34
Lung	6	6	7	6	6	6	7	6

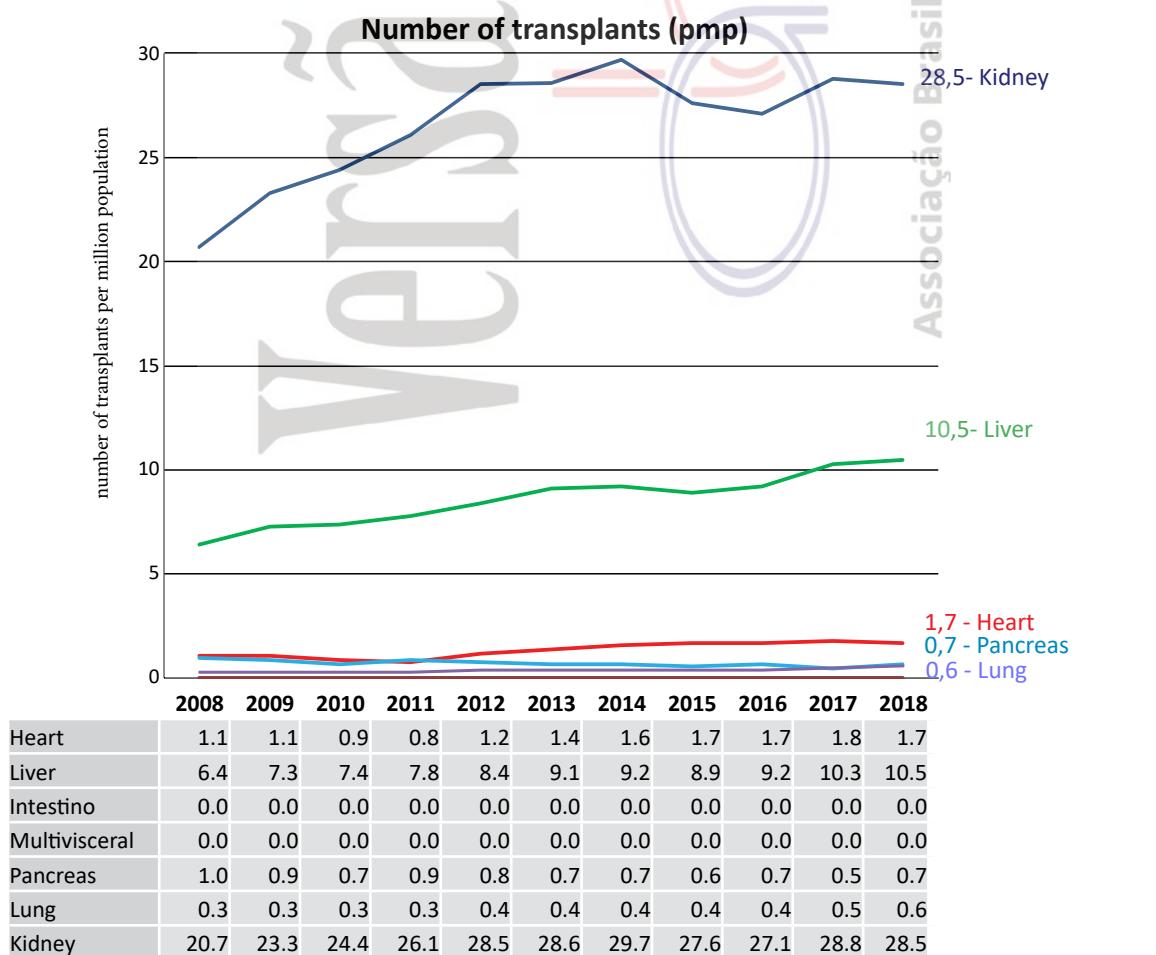
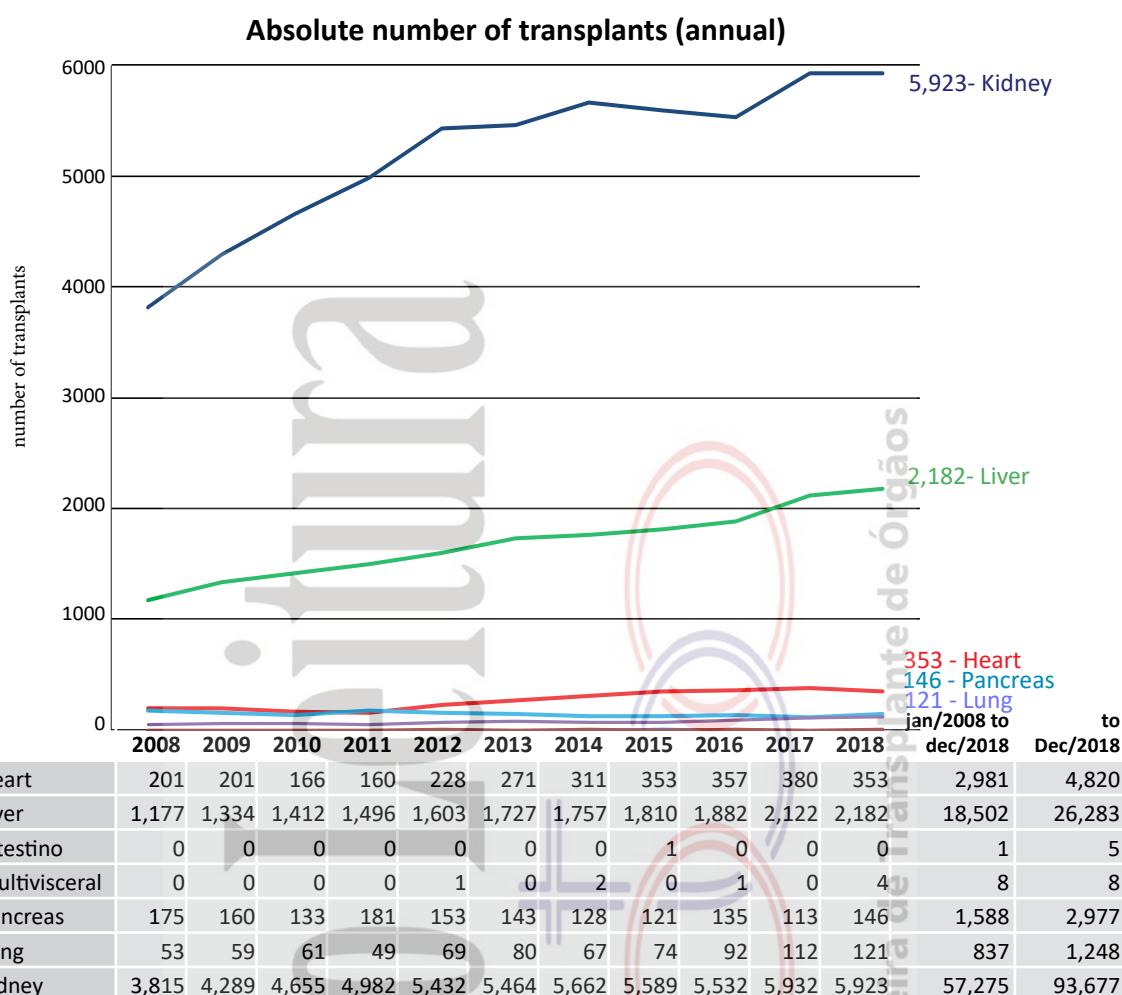
Absolute number of transplants

	2011	2012	2013	2014	2015	2016	2017	2018
Cornea	14,726	15,280	13,744	13,065	13,830	14,531	15,262	14,809
Kidney	4,982	5,432	5,464	5,662	5,589	5,532	5,932	5,923
living donors	1,652	1,501	1,386	1,385	1,189	1,218	1,136	1,018
deceased donors	3,330	3,931	4,078	4,277	4,400	4,314	4,796	4,905
Liver	1,496	1,603	1,727	1,757	1,810	1,882	2,122	2,182
Pancreas	181	153	143	128	121	135	113	146
Heart	160	228	271	311	353	357	380	353
Lung	49	69	80	67	74	92	112	121

Number of transplants pmp

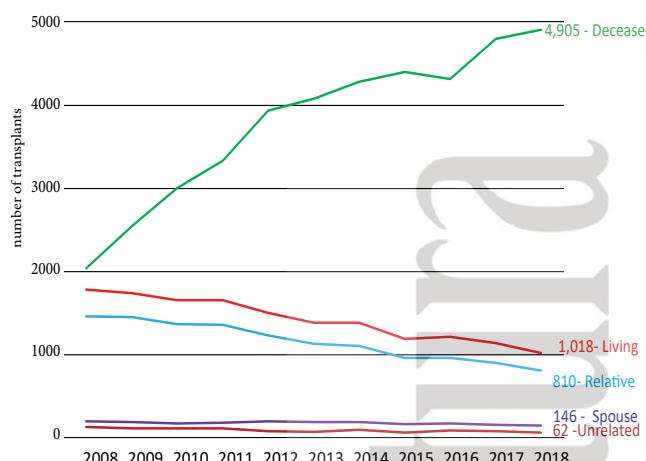
	2011	2012	2013	2014	2015	2016	2017	2018
Cornea	77.2	80.1	72.1	68.5	68.2	71.1	74.1	71.3
Kidney	26.1	28.5	28.6	29.7	27.6	27.1	28.8	28.5
living donors	8.7	7.9	7.3	7.3	5.9	6.0	5.5	4.9
deceased donors	17.5	20.6	21.4	22.4	21.7	21.1	23.3	23.6
Liver	7.8	8.4	9.1	9.2	8.9	9.2	10.3	10.5
Pancreas	0.9	0.8	0.7	0.7	0.6	0.7	0.5	0.7
Heart	0.8	1.2	1.4	1.6	1.7	1.7	1.8	1.7
Lung	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.6

Annual number of transplants in Brazil between 2008 and 2018



Annual number of transplants in Brazil between 2008 and 2018

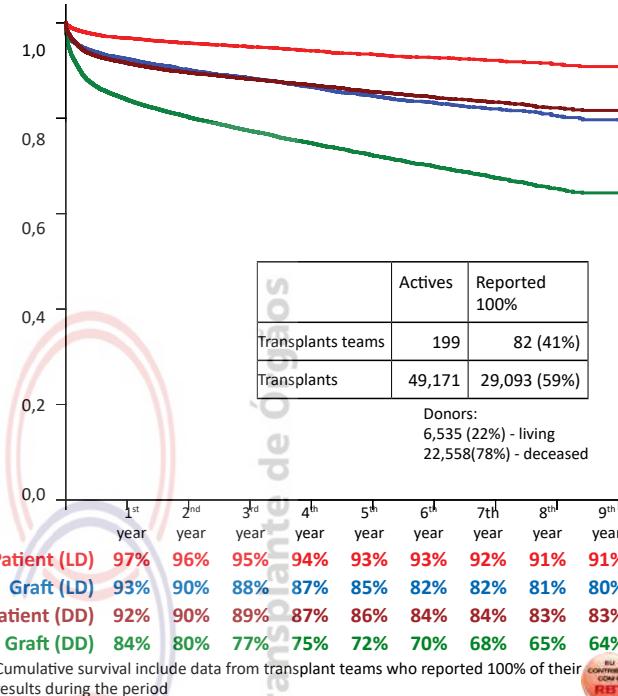
Annual number of transplants by donor type



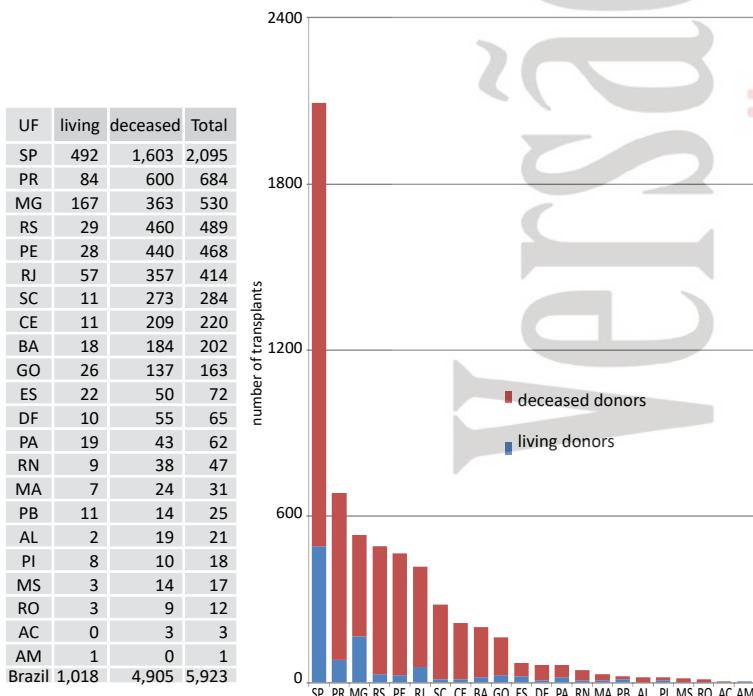
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Deceased	2,035	2,546	3,000	3,330	3,931	4,078	4,277	4,400	4,314	4,796	4,905
Living	1,780	1,743	1,655	1,652	1,501	1,386	1,385	1,189	1,218	1,136	1,018
Related	1,457	1,447	1,370	1,354	1,229	1,133	1,102	964	961	897	810
Unrelated - spouse	197	187	175	185	196	186	187	166	173	158	146
Unrelated - Others	126	109	110	113	76	67	96	59	84	81	62
Total	3,815	4,289	4,655	4,982	5,432	5,464	5,662	5,589	5,532	5,932	5,923

Kidney (22 states, with 136 teams)

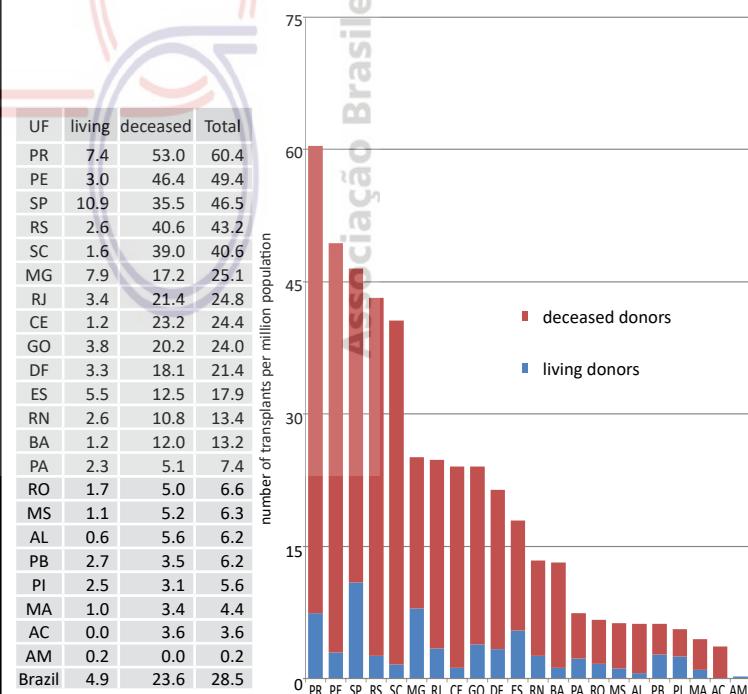
Survival Curves: Prospective evaluation started in 2010



Number of transplants by state during the year 2018



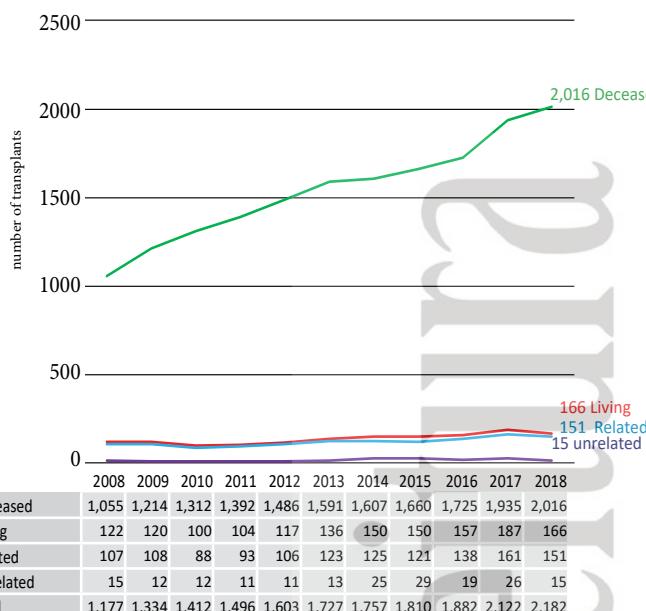
Number of transplants per million population by state during the year 2018



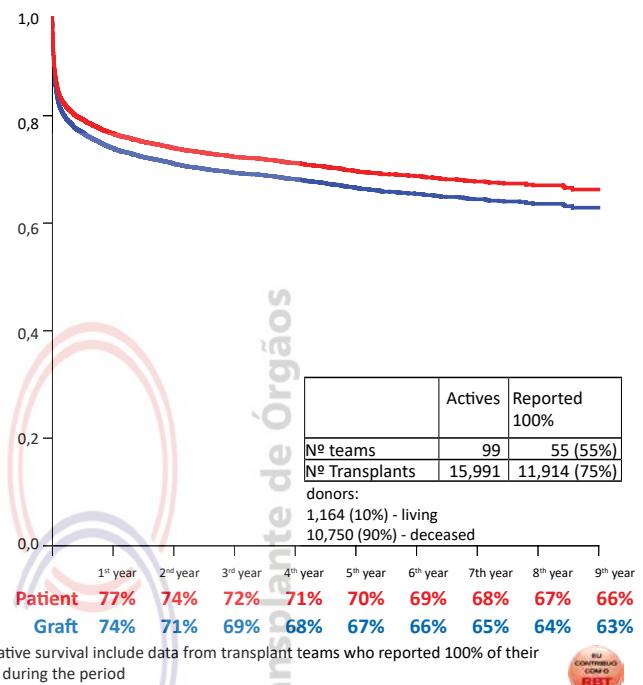
Annual number of transplants in Brazil between 2008 and 2018

Liver - (15 states, with 75 teams)

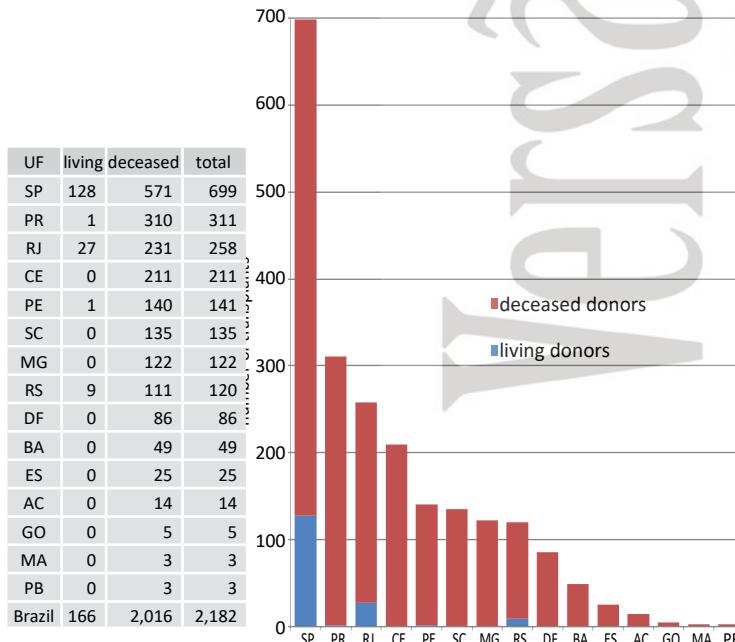
Anual number by donor type



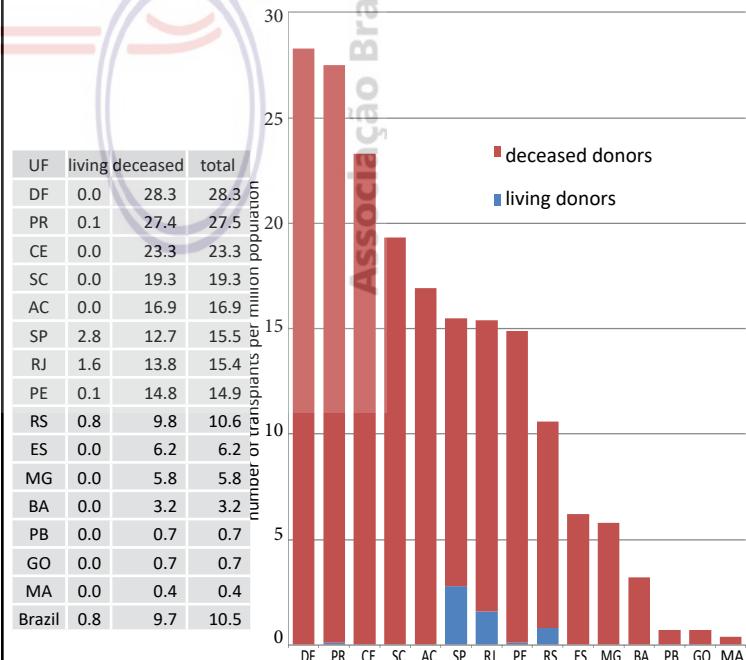
Survival Curves: Prospective evaluation started in 2010



Number of transplants by state during the year 2018

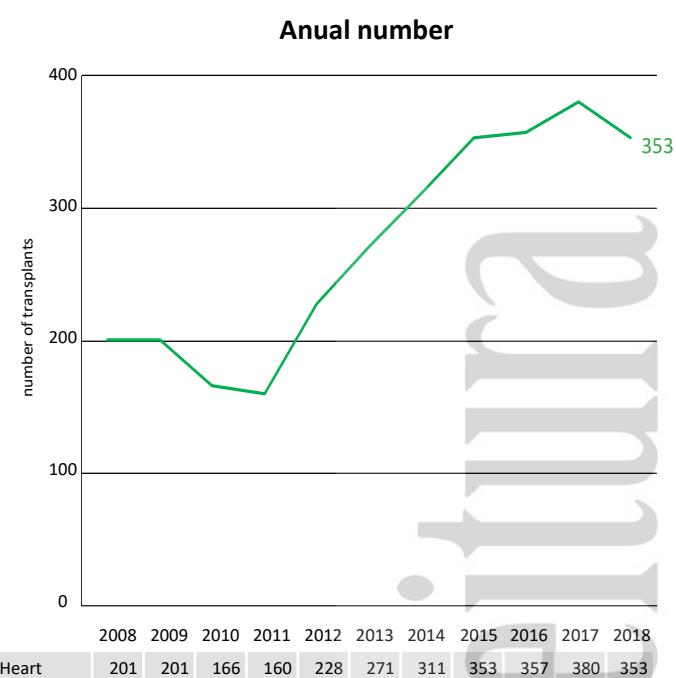


Number of transplants per million population by state during the year 2018

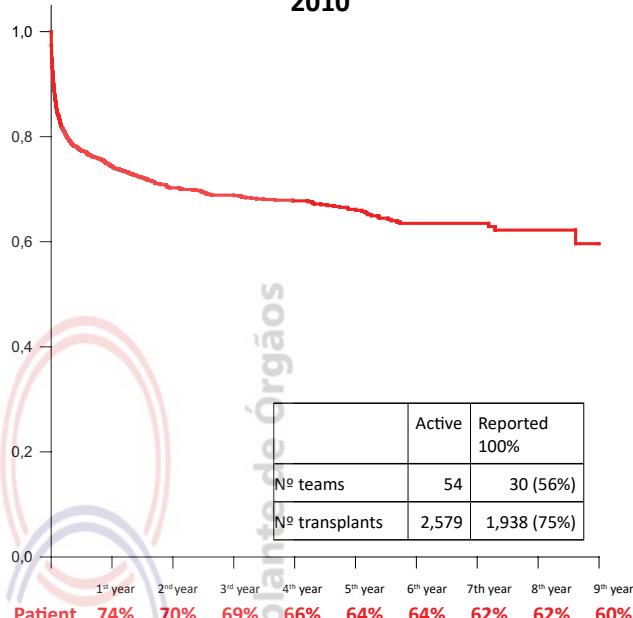


Annual number of transplants in Brazil between 2008 and 2018

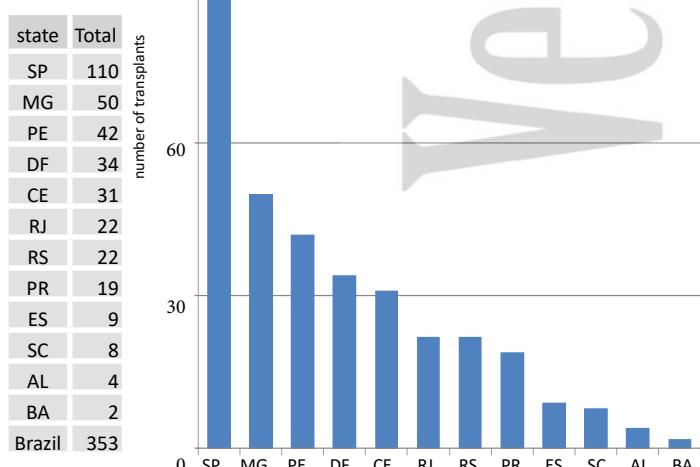
Heart - (12 states, with 34 teams)



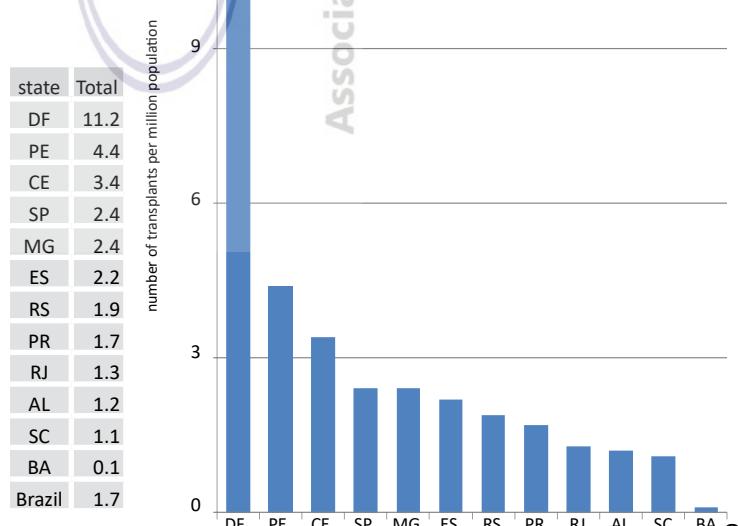
Survival Curves: Prospective evaluation started in 2010



Anual number by states in 2018



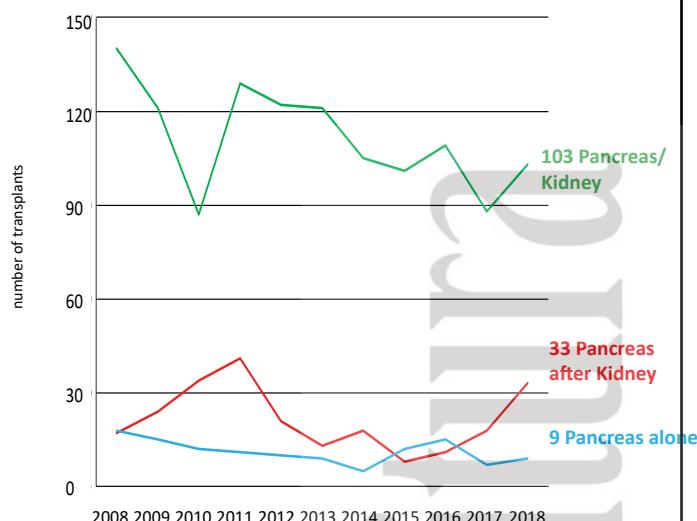
Number of transplants per million population by state during the year 2018



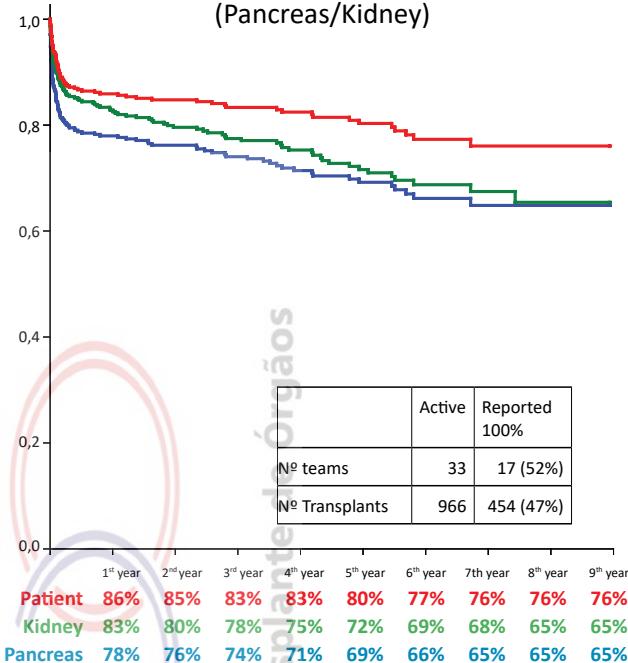
Annual number of transplants in Brazil between 2008 and 2018

PANCREAS - (7 states, with 15 teams)

Anual number

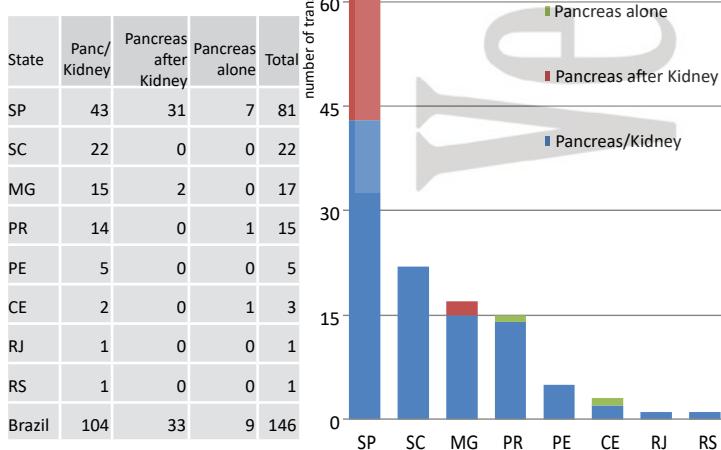


Survival Curves: Prospective evaluation started in 2010
(Pancreas/Kidney)

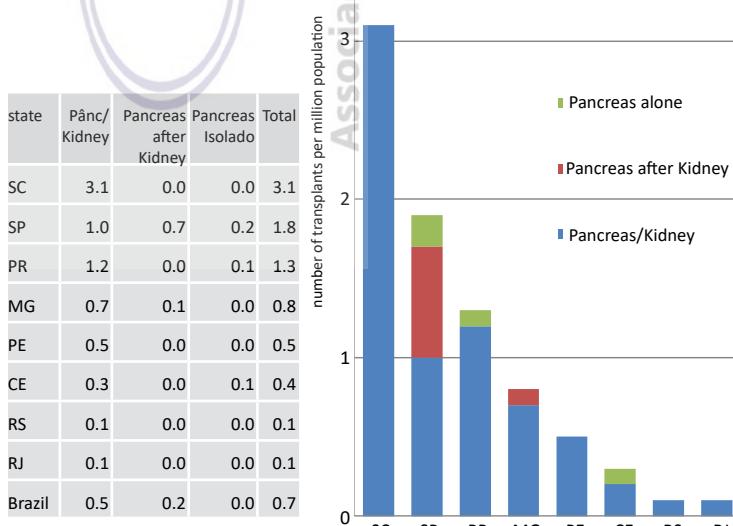


Cumulative survival include data from transplant teams who reported 100% of their results during the period

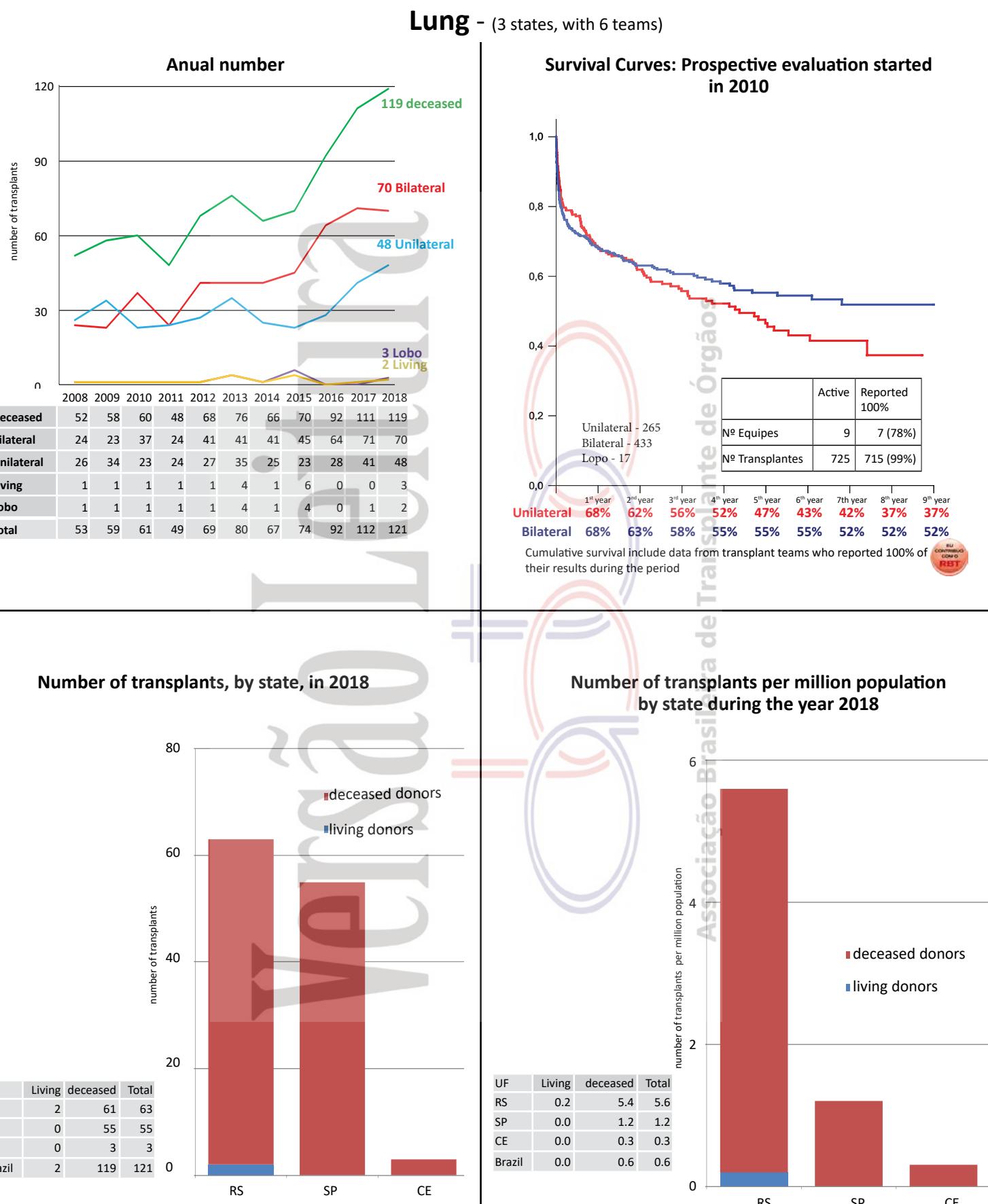
Number of transplants by state during the year 2018



Number of transplants per million population by state during the year 2018



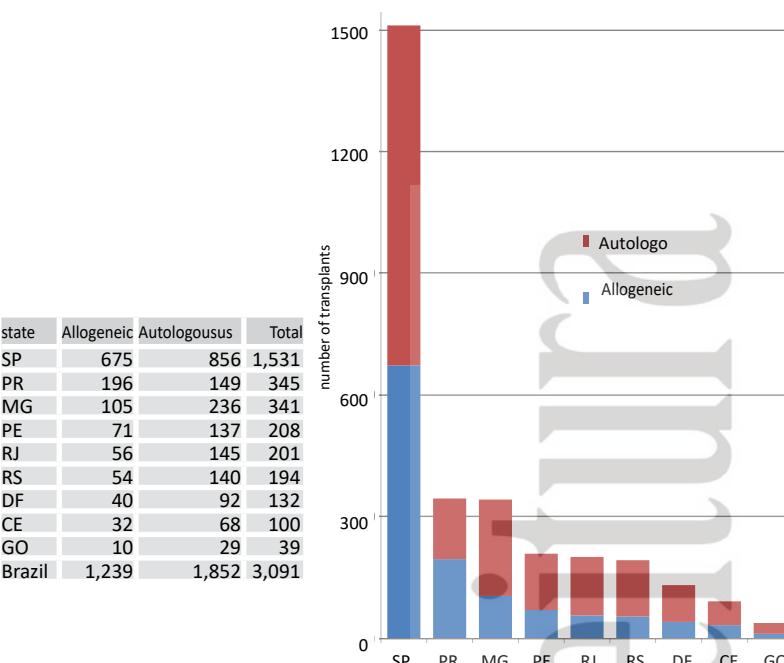
Annual number of transplants in Brazil between 2008 and 2018



Annual number of transplants in Brazil between 2008 and 2018

Bone Marrow - (9 states, with 75 teams)

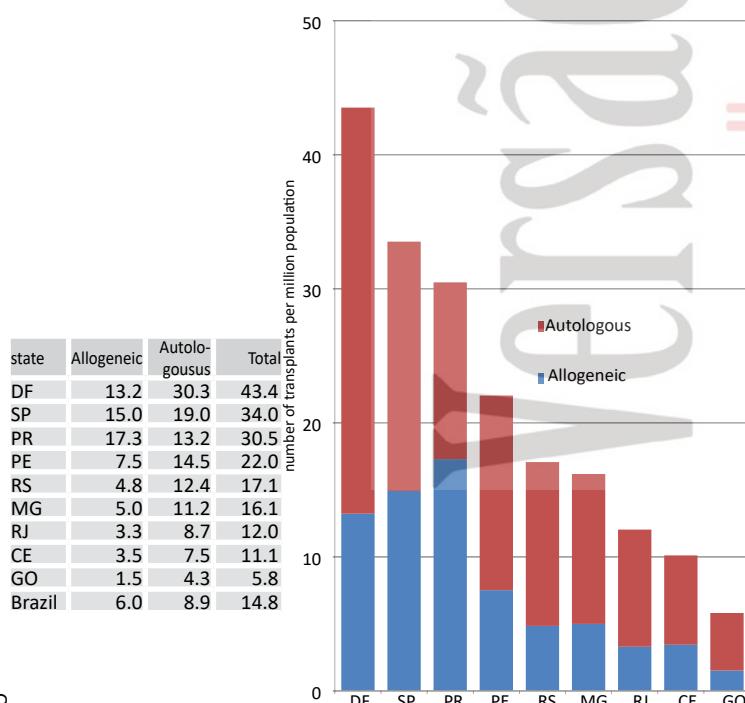
Number of bone marrow transplants by state during the year 2018



Annual number of tissue and Bone Marrow transplants

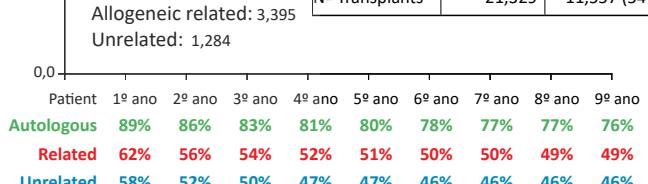


Number of bone marrow transplants per million population by state during the year 2018



Survival Curves: Prospective evaluation started in 2010 (Bone Marrow)

	Teams	Reported 100%
Nº Teams	112	40 (36%)
Nº Transplants	21,329	11,557 (54%)



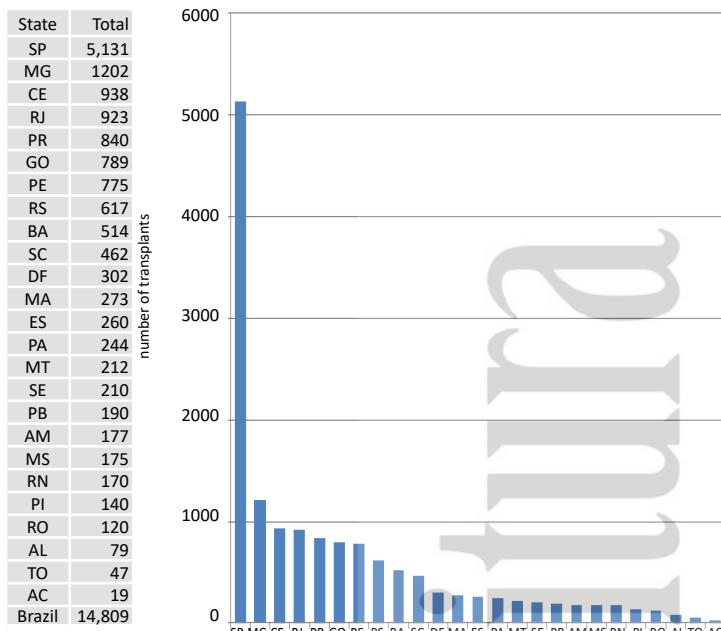
Cumulative survival include data from transplant teams who reported 100% of their results during the period



Annual number of transplants in Brazil between 2008 and 2018

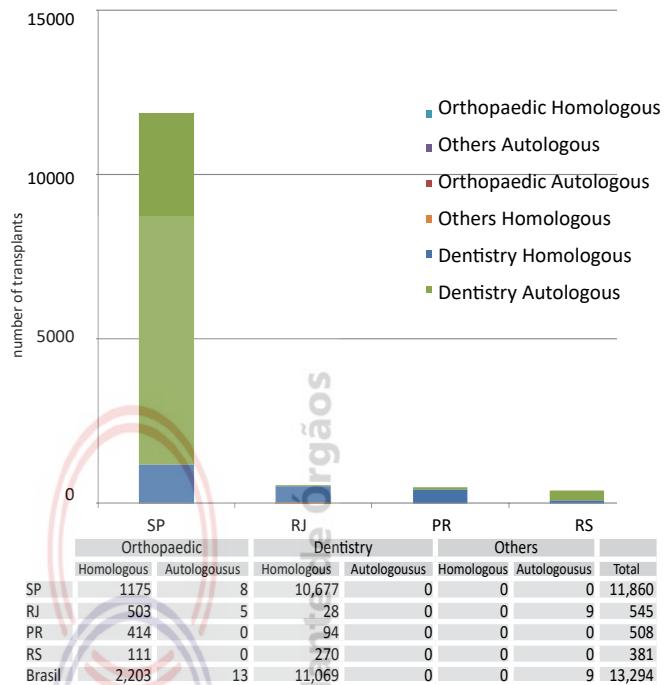
CORNEA - (in 25 states)

Number of corneal transplants by state during the year 2018

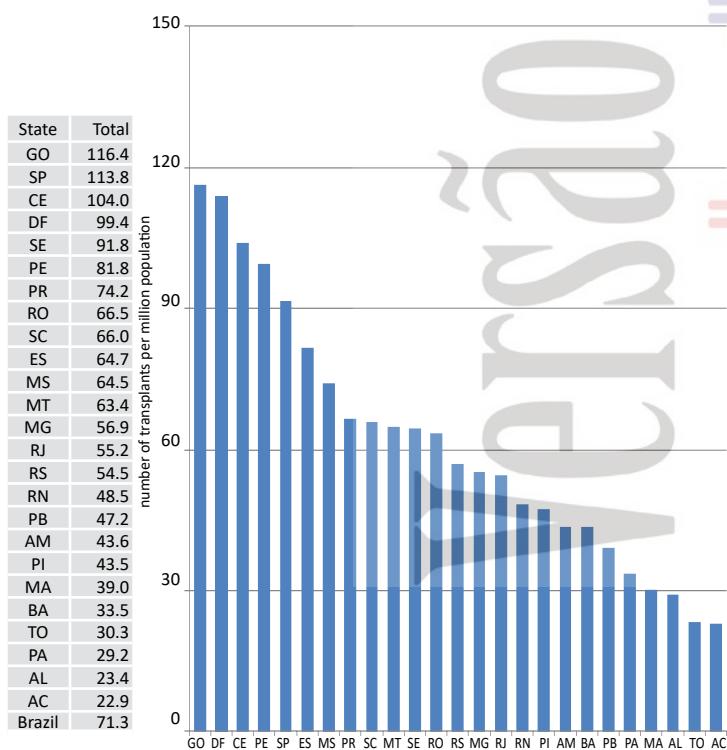


BONE- (in 4 states)

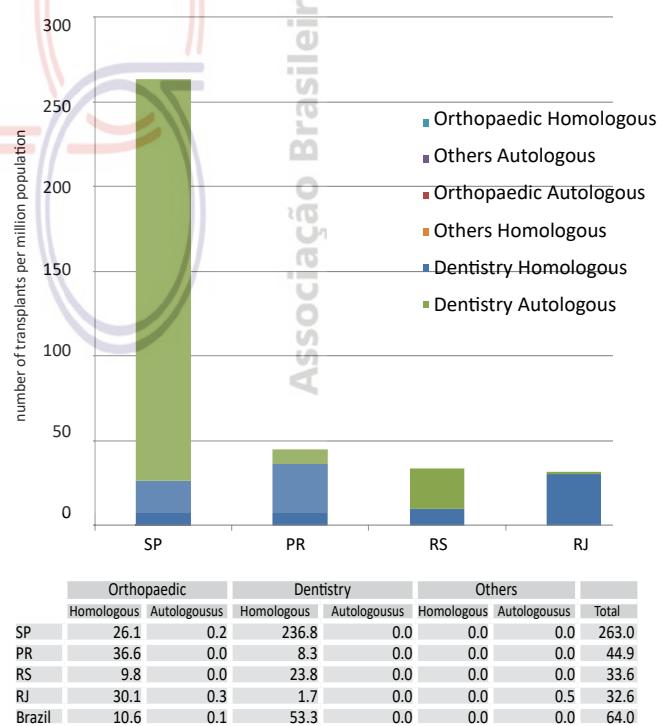
Bone transplants data available from five tissue banks in four states, during the year 2018



Number of corneal transplants per million population during the year 2018



TBone transplants per million population data available from 6 tissue banks in four states, during the year 2018



PEDIATRIC TRANSPLANTATION

EDITORIAL

Pediatric transplants in Brazil - 2018

The pediatric population in Brazil, in 2018, reached approximately 64 million (Brazilian Institute for Geographical Data - IBGE) and 1279 children were on the waiting list for a solid organ transplant, 600 (48%) received a transplant and 80 (6.2%) die on the waiting list.

In 2018, 326 (5.3 pmp) pediatric kidney transplants (KTx) were carried out in 52% of the children from the waiting list, there was an increase of 1,0% in Tx with deceased donor and of 12% with living donor, compared to 2017, KTx were carried out in 15 from the 26 Brazilian states and 9 of them performed more than 10 KTx per year: São Paulo, Rio Grande do Sul, Paraná, Minas Gerais, Rio de Janeiro, Bahia, Ceará and Pernambuco. Together, these states accounted for 95% of all pediatric KTx and provided the following rates per million population in the Brazilian regions: South 72 (9.0), Southeast 195 (8.4), Northeast 53 (2.9), North 5 (0.7), and Midwest 1 (0.2). These data reveal the great inequality among the country regions.

The number of pediatric liver transplants (LTx) has also increased: 180 in 2016, 206 in 2017 and 225 in 2018 or 3.7 pmp, Since 2015 the number of LTx with living donor is increasing while a decrease was observed with deceased donor, In contrary, in 2018, LTx with deceased donor went from 63 in 2017 to 91 while with living donor from 150 to 134, Living donors were used only in the states of São Paulo (110), Rio de Janeiro (14), Rio Grande do Sul (9) and Pernambuco (1). Last year, 351 children were in need for a LTx but only 225 (64%) were performed and 44 (12%) die in the waiting list.

Pediatric heart transplantation (0.6 pmp) and lung transplantation (0.2 pmp) rates remained very low, In 2018, 51 children in need for a heart jointed to the 41 already on the list in December 2017 totaling 92, but only 36 (39%) were transplanted and 23 (25%) died in the waiting list.

Twelve children were in need for a lung Tx in 2018 and

together with the 21 already on the list in December 2017 they totalized 33, but only 12 (36%) were transplanted and one die (3.0%) in the list.

The 2018 registry shows that less than half (47%) of the children in waiting list for solid organ were transplanted and therefore it is urgent to increase organ donation and the number of transplant as well as the better use of donated organs.

In December 2018, 425 children needed an organ transplantation: 300 were waiting for a kidney, 55 for a liver, 48 for a heart and 22 for a lung .

In order to fulfill the pediatric transplant needs we have to maximize our efforts to transplant all children waiting for a solid organ transplant as well as to work hard aiming that all of them achieve to reach a transplantation center.

Clotilde Druck Garcia

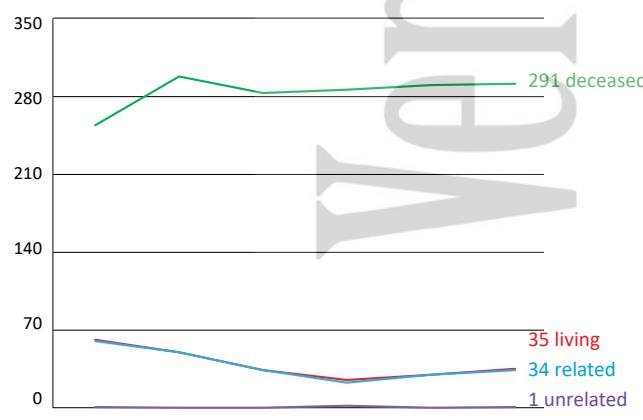
Number of pediatric transplants in 2018

Organ	Living	Deceased	Total	PMPP*	Nº teams
Heart	0	36	36	0.6	9
Liver	134	91	225	3.7	33
Lung	2	10	12	0.2	4
Multivisceral	0	1	1	0.0	1
Kidney	35	291	326	5.3	52
Total	171	429	600	9.8	99

Bone	Allogeneic	Autologous	Total	PMPP*	Nº teams
Marrow	319	94	413	6.8	35

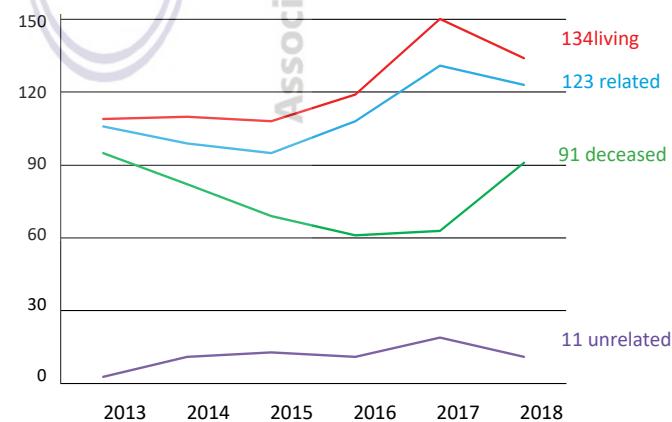
PMPP*- per million of pediatric population

Annual number of pediatric Kidney transplants



	Falecido	Vivo	Parente	Não Parente	Total
AC	254	61	60	1	315
AL	298	50	50	0	348
AP	283	34	34	0	317
AM	286	25	23	2	311
BA	290	30	30	0	320
CE	291	35	34	1	326
DF					
ES					
GO					
MA					
MT					
MS					
MG					
PA					

Annual number of pediatric Liver transplants



	Deceased	Living	Related	Unrelated	Total
Deceased	95	109	106	3	204
Living	82	110	99	11	192
Related	69	108	95	13	177
Unrelated	61	119	108	11	180
	63	150	131	19	213
	91	134	123	11	225

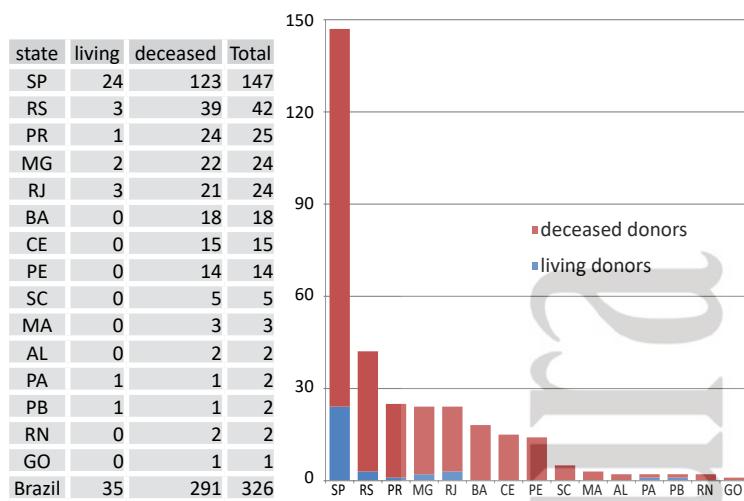
Pediatric Population

	AC	AL	AP	AM	BA	CE	DF	ES	GO	MA	MT	MS	MG	PA
333,220	1,191,172	317,672	1,607,648	4,805,335	2,879,795	874,130	1,132,701	1,989,182	2,606,159	1,047,522	828,549	5,845,487	3,128,870	
PB	PR	PE	PI	RJ	RN	RS	RO	RR	SC	SP	SE	TO	Brasil	
1,244,643	3,198,146	2,958,194	1,044,223	4,340,491	1,066,173	2,918,322	599,416	206,036	1,889,840	11,830,673	749,936	540,486	61,174,021	

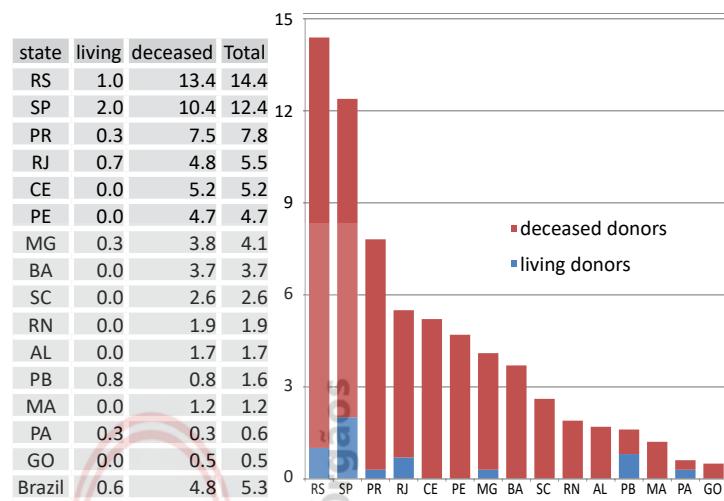
PEDIATRIC TRANSPLANTATION

Kidney

Number of transplants, by state, in 2018

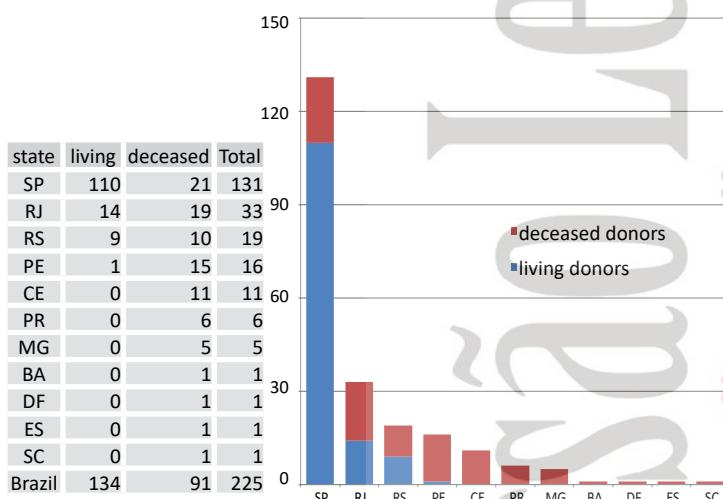


Transplants pmp pediatrics by state, 2018

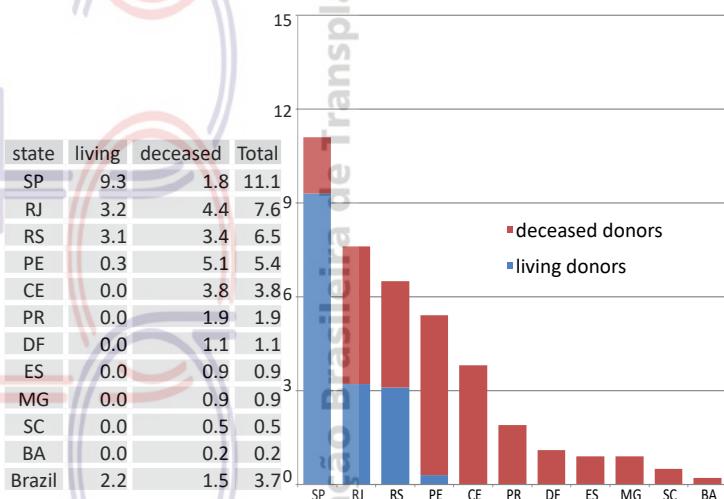


Liver

Number of transplants, by state, in 2018

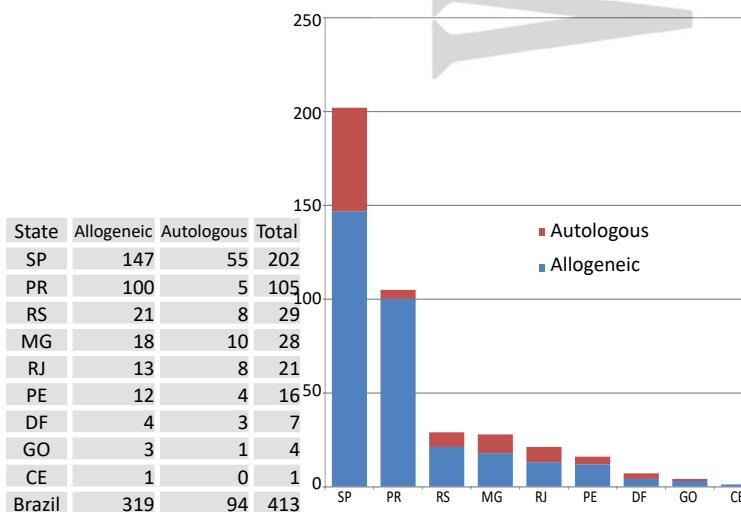


Transplants pmp pediatrics by state, 2018

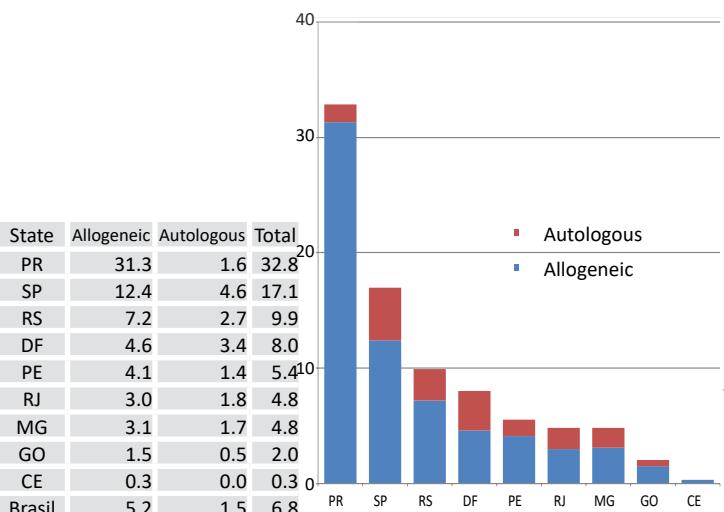


Bone Marrow

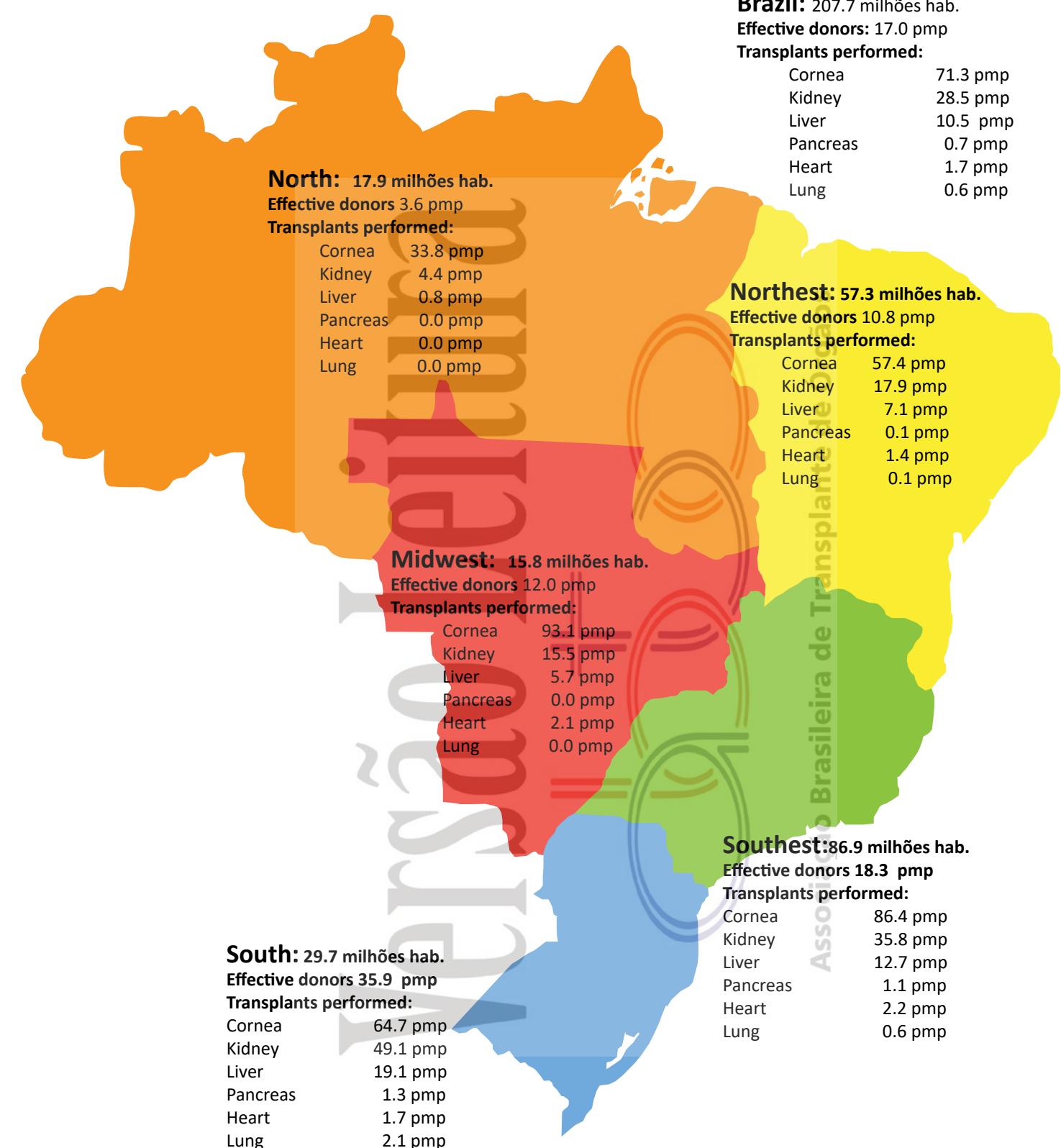
Number of transplants, by state, in 2018



Transplants pmp pediatrics by state, 2018



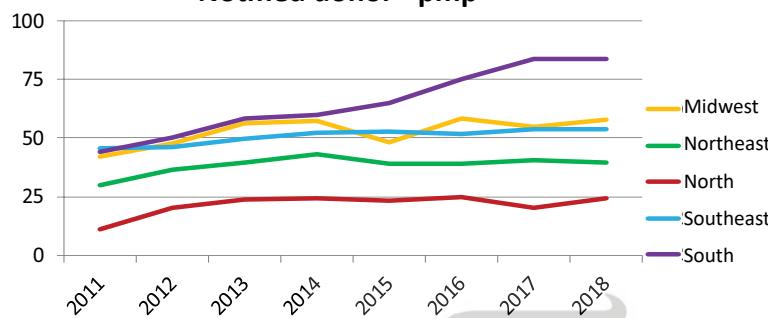
DATA FROM BRAZILIAN REGIONS



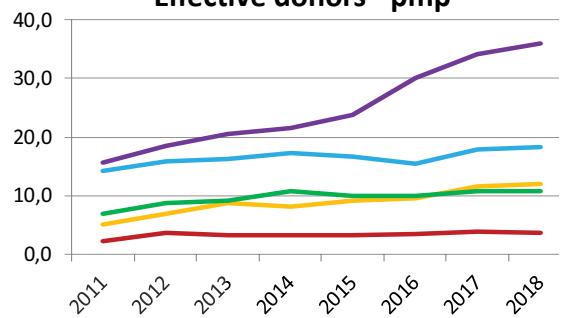
DATA FROM BRAZILIAN REGIONS

ORGAN DONATION

Notified donor - pmp



Effective donors - pmp



Number of potential donors by year

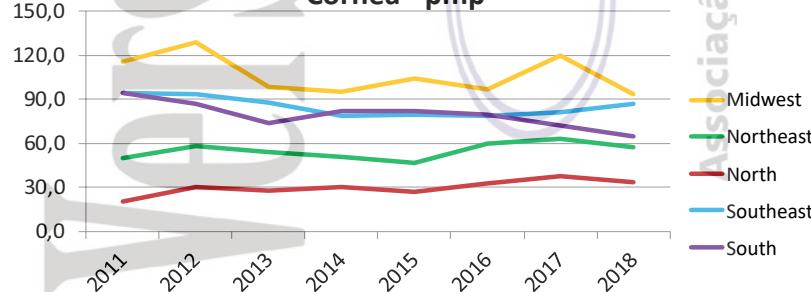
Absolute Number	2011	2012	2013	2014	2015	2016	2017	2018
MIDWEST	589	671	789	807	734	897	856	916
NORTHEAST	1,589	1,948	2,102	2,298	2,208	2,205	2,305	2,276
NORTH	175	319	378	384	401	432	357	435
SOUTHEAST	3,673	3,718	4,010	4,219	4,474	4,433	4,643	4,660
SOUTH	1,212	1,369	1,592	1,643	1,881	2,190	2,467	2,491
Number pmp	2011	2012	2013	2014	2015	2016	2017	2018
MIDWEST	41.9	47.7	56.1	57.4	48.2	58.1	54.7	57.7
NORTHEAST	29.9	36.7	39.6	43.3	39.3	39.0	40.5	39.8
NORTH	11.0	20.1	23.8	24.2	23.3	24.7	20.2	24.3
SOUTHEAST	45.7	46.3	49.9	52.5	52.6	51.7	53.8	53.6
SOUTH	44.3	50.0	58.1	60.0	64.8	74.9	83.8	84.0

Number of effective donors by year

Absolute Number	2011	2012	2013	2014	2015	2016	2017	2018
MIDWEST	72	98	124	115	139	148	183	190
NORTHEAST	367	466	489	569	555	561	613	619
NORTH	37	58	53	53	57	62	69	64
SOUTHEAST	1,143	1,274	1,298	1,387	1,414	1,330	1,546	1,593
SOUTH	429	510	562	589	689	880	1,004	1,065
Number pmp	2011	2012	2013	2014	2015	2016	2017	2018
MIDWEST	5.1	7.0	8.8	8.2	9.1	9.6	11.7	12.0
NORTHEAST	6.9	8.8	9.2	10.7	9.9	9.9	10.8	10.8
NORTH	2.3	3.7	3.3	3.3	3.3	3.5	3.9	3.6
SOUTHEAST	14.2	15.9	16.2	17.3	16.6	15.5	17.9	18.3
SOUTH	15.7	18.6	20.5	21.5	23.7	30.1	34.1	35.9

Tissue Transplantation

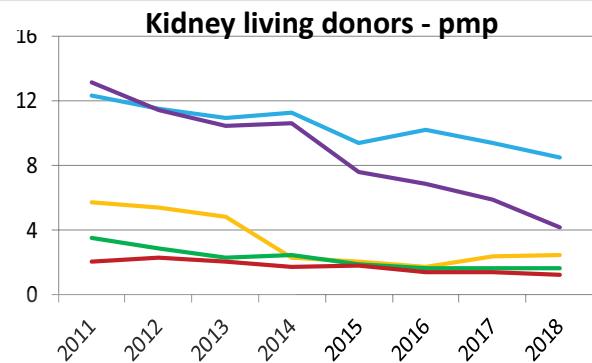
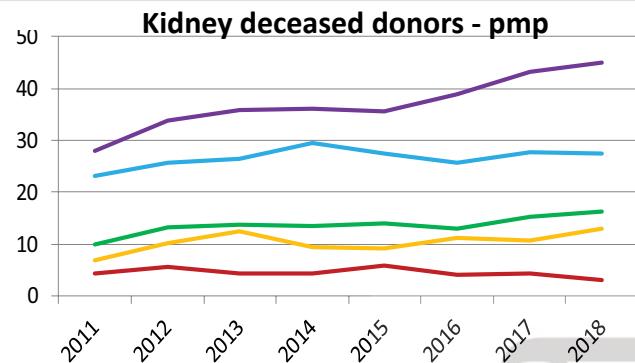
Cornea - pmp



Cornea	2011	2012	2013	2014	2015	2016	2017	2018
Absolute Number	14,726	15,280	13,744	13,085	13,830	14,534	15,242	14,809
MIDWEST	1,620	1,811	1,377	1,341	1,579	1,491	1,871	1,478
NORTHEAST	2,651	3,087	2,883	2,697	2,625	3,387	3,570	3,289
NORTH	317	480	438	476	468	576	660	607
SOUTHEAST	7,557	7,534	7,022	6,321	6,784	6,754	7,014	7,516
SOUTH	2,581	2,368	2,024	2,250	2,374	2,326	2,127	1,919
Number pmp	77.2	80.1	72.1	68.6	68.2	71.1	74.0	71.3
MIDWEST	115.2	128.8	98.0	95.4	103.7	96.6	119.5	93.1
NORTHEAST	49.9	58.2	54.3	50.8	46.7	59.9	62.7	57.4
NORTH	20.0	30.3	27.6	30.0	27.2	33.0	37.3	33.8
SOUTHEAST	94.0	93.7	87.4	78.7	79.7	78.8	81.2	86.4
SOUTH	94.2	86.5	73.9	82.2	81.8	79.6	72.2	64.7

DATA FROM BRAZILIAN REGIONS

Organ Transplantation

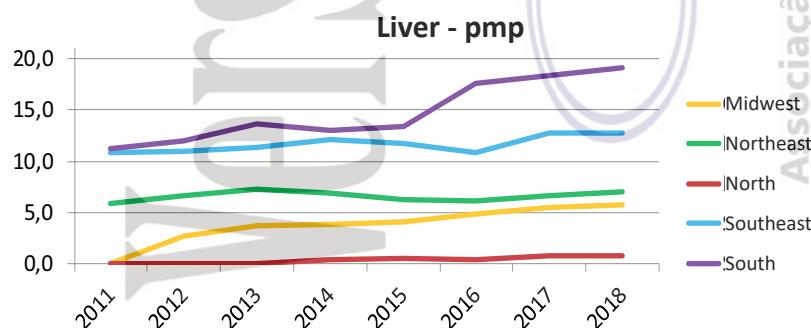


Kidney (living donors)		2011	2012	2013	2014	2015	2016	2017	2018
Absolute Number		1,652	1,501	1,386	1,385	1,189	1,218	1,136	1,018
MIDWEST		81	76	68	33	31	27	37	39
NORtheast		187	153	124	132	107	94	94	94
NORTH		33	37	33	27	31	25	25	23
SOUTHEAST		991	923	876	903	800	872	807	738
SOUTH		360	312	285	290	220	200	173	124

Number pmp		2011	2012	2013	2014	2015	2016	2017	2018
MIDWEST		5.8	5.4	4.8	2.3	2.0	1.7	2.4	2.5
NORtheast		3.5	2.9	2.3	2.5	1.9	1.7	1.7	1.6
NORTH		2.1	2.3	2.1	1.7	1.8	1.4	1.4	1.3
SOUTHEAST		12.3	11.5	10.9	11.2	9.4	10.2	9.3	8.5
SOUTH		13.1	11.4	10.4	10.6	7.6	6.8	5.9	4.2

Kidney (deceased donors)		2011	2012	2013	2014	2015	2016	2017	2018
Absolute Number		3,330	3,931	4,078	4,277	4,400	4,314	4,796	4,905
MIDWEST		97	143	177	134	141	172	169	206
NORtheast		532	698	731	715	791	735	868	938
NORTH		68	91	70	68	101	73	78	55
SOUTHEAST		1,867	2,071	2,119	2,370	2,332	2,197	2,405	2,373
SOUTH		766	928	981	990	1,035	1,137	1,276	1,333

Number pmp		2011	2012	2013	2014	2015	2016	2017	2018
MIDWEST		6.9	10.2	12.6	9.5	9.3	11.1	10.8	13.0
NORtheast		10.0	13.1	13.8	13.5	14.1	13.0	15.3	16.3
NORTH		4.3	5.7	4.4	4.3	5.9	4.2	4.4	3.1
SOUTHEAST		23.2	25.8	26.4	29.5	27.4	25.6	27.8	27.3
SOUTH		28.0	33.9	35.8	36.1	35.7	38.9	43.3	44.9

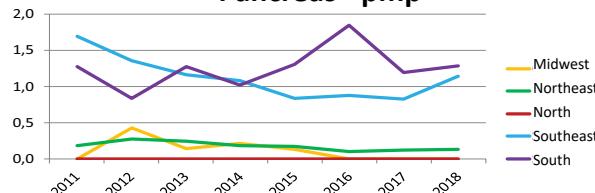


Liver		2011	2012	2013	2014	2015	2016	2017	2018
Absolute Number		1,496	1,603	1,727	1,757	1,810	1,882	2,122	2,182
MIDWEST		0	39	53	54	62	76	86	91
NORtheast		316	353	390	365	350	350	381	407
NORTH		0	0	1	7	9	7	14	14
SOUTHEAST		872	881	909	976	1,000	935	1,101	1,104
SOUTH		308	330	374	355	389	514	540	566

Number pmp		2011	2012	2013	2014	2015	2016	2017	2018
MIDWEST		0.0	2.8	3.8	3.8	4.1	4.9	5.5	5.7
NORtheast		6.0	6.7	7.3	6.9	6.2	6.2	6.7	7.1
NORTH		0.0	0.0	0.1	0.4	0.5	0.4	0.8	0.8
SOUTHEAST		10.9	11.0	11.3	12.1	11.7	10.9	12.7	12.7
SOUTH		11.2	12.0	13.7	13.0	13.4	17.6	18.3	19.1

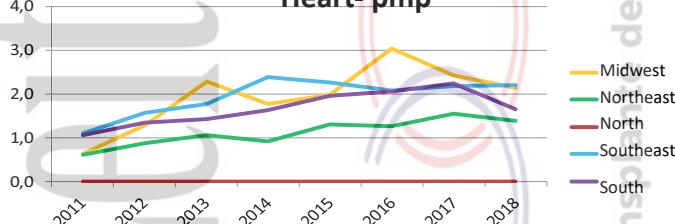
DATA FROM BRAZILIAN REGIONS

Pancreas - pmp



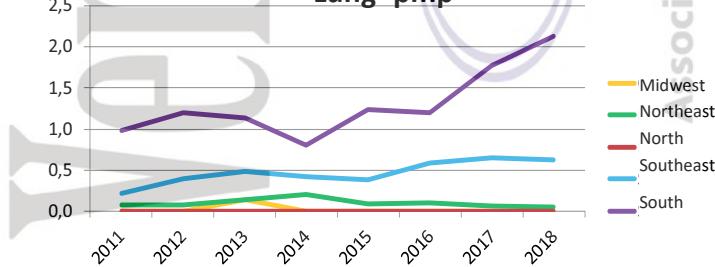
PANCREAS	2011	2012	2013	2014	2015	2016	2017	2018
Absolute number	181	153	143	128	121	135	113	146
MIDWEST	0	6	2	3	2	0	0	0
NORTHEAST	10	15	13	10	10	6	7	9
NORTH	0	0	0	0	0	0	0	0
SOUTHEAST	136	109	93	87	71	75	71	99
SOUTH	35	23	35	28	38	54	35	38
Number pmp	0.9	0.8	0.7	0.7	0.6	0.7	0.5	0.7
MIDWEST	0.0	0.4	0.1	0.2	0.1	0.0	0.0	0.0
NORTHEAST	0.2	0.3	0.2	0.2	0.2	0.1	0.1	0.1
NORTH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SOUTHEAST	1.7	1.4	1.2	1.1	0.8	0.9	0.8	1.1
SOUTH	1.3	0.8	1.3	1.0	1.3	1.8	1.2	1.3

Heart- pmp



Heart	2011	2012	2013	2014	2015	2016	2017	2018
Absolute number	160	228	271	311	353	357	380	353
MIDWEST	9	18	32	25	30	47	38	34
NORTHEAST	33	47	57	49	73	72	88	79
NORTH	0	0	0	0	0	0	0	0
SOUTHEAST	89	126	143	192	193	178	188	191
SOUTH	29	37	39	45	57	60	66	49
Number pmp	0.8	1.2	1.4	1.6	1.7	1.7	1.8	1.7
MIDWEST	0.6	1.3	2.3	1.8	2.0	3.0	2.4	2.1
NORTHEAST	0.6	0.9	1.1	0.9	1.3	1.3	1.5	1.4
NORTH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SOUTHEAST	1.1	1.6	1.8	2.4	2.3	2.1	2.2	2.2
SOUTH	1.1	1.4	1.4	1.6	2.0	2.1	2.2	1.7

Lung- pmp



Lung	2011	2012	2013	2014	2015	2016	2017	2018
Absolute number	49	69	80	67	74	92	112	121
MIDWEST	0	0	2	0	0	0	0	0
NORTHEAST	4	4	8	11	5	6	4	3
NORTH	0	0	0	0	0	0	0	0
SOUTHEAST	18	32	39	34	33	51	56	55
SOUTH	27	33	31	22	36	35	52	63
Number pmp	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.6
MIDWEST	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
NORTHEAST	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1
NORTH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SOUTHEAST	0.2	0.4	0.5	0.4	0.4	0.6	0.6	0.6
SOUTH	1.0	1.2	1.1	0.8	1.2	1.2	1.8	2.1

Waiting List

Patients active on the waiting list (December 2018)

State	Kidney	Liver	Heart	Lung	Pancreas	Pancreas/ Kidney	Cornea	TOTAL
Total - Brazil	22,581	1,184	282	185	24	410	8,788	33,454
Acre	20	9	0	0	0	0	24	53
Alagoas	251	0	7	0	0	0	87	345
Amazonas	0	0	0	0	0	0	52	52
Bahia	949	4	0	0	0	0	735	1,688
Ceará	696	173	22	3	0	8	0	902
Distrito Federal	326	18	15	0	0	0	246	605
Espírito Santo	896	53	7	0	0	0	126	1,082
Goiás	214	2	0	0	0	0	119	335
Maranhão	150	1	0	0	0	0	442	593
Mato Grosso	0	0	0	0	0	0	170	170
Mato Grosso do Sul	78	0	0	0	0	0	127	205
Minas Gerais	2,780	46	19	0	5	59	1,065	3,974
Pará	202	0	0	0	0	0	868	1,070
Paraíba	134	7	0	0	0	0	331	472
Paraná	947	170	24	0	0	15	31	1,187
Pernambuco	656	77	8	0	0	6	4	751
Piauí	177	0	0	0	0	0	343	520
Rio de Janeiro	1,007	50	11	0	0	1	1,097	2,166
Rio Grande do Norte	211	0	0	0	0	0	191	402
Rio Grande do Sul	974	129	15	81	4	4	49	1,256
Rondonia	81	0	0	0	0	0	154	235
Santa Catarina	299	22	2	0	0	9	34	366
São Paulo	11,533	423	151	101	15	308	2,273	14,804
Sergipe	0	0	1	0	0	0	166	167
Tocantins	0	0	0	0	0	0	54	54

Pediatric patients active on the waiting list (December 2018)

State	Kidney	Liver	Heart	Lung	Pancreas	Pancreas/ Kidney	Cornea	TOTAL
Total - Brasil	300	55	48	22	0	0	210	635
Acre	0	0	0	0	0	0	0	0
Alagoas	1	0	0	0	0	0	11	12
Amazonas	0	0	0	0	0	0	5	5
Bahia	0	0	0	0	0	0	0	0
Ceará	11	0	6	0	0	0	0	17
Distrito Federal	0	0	0	0	0	0	0	0
Espírito Santo	9	0	0	0	0	0	6	15
Goiás	0	0	0	0	0	0	6	6
Maranhão	0	0	0	0	0	0	0	0
Mato Grosso	0	0	0	0	0	0	14	14
Mato Grosso do Sul	0	0	0	0	0	0	3	3
Minas Gerais	9	0	0	0	0	0	45	54
Pará	9	0	0	0	0	0	0	9
Paraíba	0	0	0	0	0	0	0	0
Paraná	9	1	1	0	0	0	2	13
Pernambuco	10	9	0	0	0	0	0	19
Piauí	1	0	0	0	0	0	13	14
Rio de Janeiro	5	11	2	0	0	0	28	46
Rio Grande do Norte	0	0	0	0	0	0	0	0
Rio Grande do Sul	15	3	5	7	0	0	1	31
Rondonia	0	0	0	0	0	0	0	0
Santa Catarina	2	0	0	0	0	0	0	2
São Paulo	219	31	34	15	0	0	73	372
Sergipe	0	0	0	0	0	0	3	3
Tocantins	0	0	0	0	0	0	0	0

Waiting List

Number of patients and mortality by State

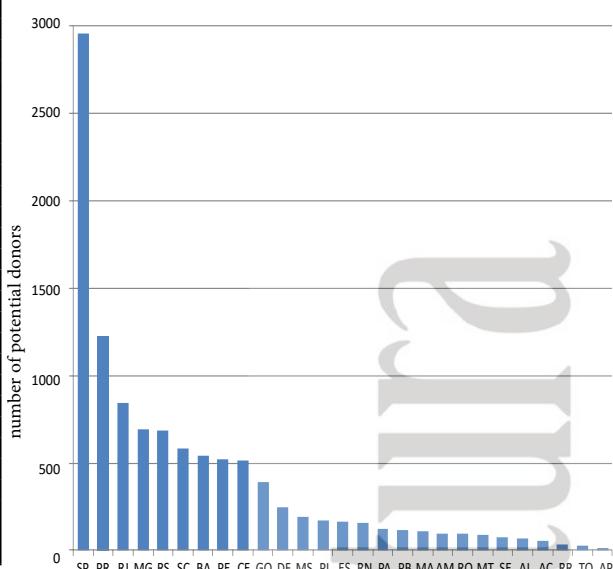
	Kidney		Liver		Heart		Lung		Pancreas		Pancreas/ Kidney		Cornea		TOTAL		
	Total	Pediátrico	Total	Pediátrico	Total	Pediátrico	Total	Pediátrico	Total	Pediátrico	Total	Pediátrico	Total	Pediátrico	Total	Pediátrico	
Total - Brazil	Entering	10,637	284	2,908	260	450	51	152	12	39	0	195	0	16,303	539	30,684	1,146
	Mortality	1,299	12	1,253	44	132	23	35	1	4	0	27	0	101	0	2,851	80
Acre	Entering	14	0	29	0	0	0	0	0	0	0	0	0	27	0	70	0
	Mortality	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Alagoas	Entering	38	0	0	0	9	0	0	0	0	0	0	0	118	0	165	0
	Mortality	11	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0
Amazonas	Entering	1	0	0	0	0	0	0	0	0	0	0	0	249	13	250	13
	Mortality	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bahia	Entering	676	0	76	0	2	0	0	0	0	0	0	0	1027	0	1781	0
	Mortality	103	0	19	0	0	0	0	0	0	0	0	0	1	0	123	0
Ceará	Entering	345	20	381	7	43	7	3	0	1	0	5	0	583	20	1361	54
	Mortality	19	0	568	11	76	12	0	0	0	0	0	0	49	0	712	23
Distrito Federal	Entering	191	0	69	0	25	0	0	0	0	0	0	0	251	0	536	0
	Mortality	7	0	14	0	7	0	0	0	0	0	0	0	4	0	32	0
Espírito Santo	Entering	875	0	133	0	46	0	0	0	0	0	0	0	957	0	2011	0
	Mortality	168	0	60	0	5	0	0	0	0	0	0	0	0	0	233	0
Goiás	Entering	184	1	8	0	0	0	0	0	0	0	0	0	924	43	1116	44
	Mortality	10	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0
Maranhão	Entering	70	4	1	0	0	0	0	0	0	0	0	0	304	1	375	5
	Mortality	6	0	0	0	0	0	0	0	0	0	0	0	6	0	12	0
Mato Grosso	Entering	0	0	0	0	0	0	0	0	0	0	0	0	315	22	315	22
	Mortality	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mato Grosso do Sul	Entering	47	0	0	0	0	0	0	0	0	0	0	0	301	9	348	9
	Mortality	6	0	0	0	0	0	0	0	0	0	0	0	1	0	7	0
Minas Gerais	Entering	341	7	31	0	20	1	0	0	2	0	12	0	398	23	804	31
	Mortality	25	0	7	1	3	0	0	0	0	0	0	0	0	0	35	1
Pará	Entering	185	3	0	0	0	0	0	0	0	0	0	0	297	0	482	3
	Mortality	12	0	0	0	0	0	0	0	0	0	0	0	9	0	21	0
Paraíba	Entering	202	1	10	0	0	0	0	0	0	0	0	0	258	0	470	1
	Mortality	36	0	6	0	0	0	0	0	0	0	0	0	15	0	57	0
Paraná	Entering	186	4	46	2	6	1	0	0	0	0	2	0	160	3	400	10
	Mortality	18	0	13	0	1	1	0	0	0	0	1	0	2	0	35	1
Pernambuco	Entering	639	16	293	34	55	5	0	0	0	0	11	0	984	67	1982	122
	Mortality	39	1	75	11	8	3	0	0	0	0	0	0	0	0	122	15
Piauí	Entering	129	1	0	0	0	0	0	0	0	0	0	0	206	19	335	20
	Mortality	16	0	0	0	0	0	0	0	0	0	0	0	2	0	18	0
Rio de Janeiro	Entering	640	0	283	0	21	0	0	0	0	0	3	0	1277	0	2224	0
	Mortality	16	0	31	0	4	0	0	0	0	0	0	0	6	0	57	0
Rio Grande do Norte	Entering	103	0	0	0	0	0	0	0	0	0	0	0	128	38	231	38
	Mortality	7	0	0	0	0	0	0	0	0	0	0	0	1	0	8	0
Rio Grande do Sul	Entering	743	39	221	28	26	6	86	5	2	0	1	0	972	41	2051	119
	Mortality	62	2	51	3	3	2	24	1	0	0	0	0	1	0	141	8
Rondônia	Entering	28	0	0	0	0	0	0	0	0	0	0	0	143	0	171	0
	Mortality	1	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0
Santa Catarina	Entering	296	4	138	0	10	0	0	0	0	0	15	0	486	4	945	8
	Mortality	9	0	14	0	4	0	0	0	0	0	1	0	0	0	28	0
São Paulo	Entering	4704	184	1189	189	187	31	63	7	34	0	146	0	5738	232	12061	643
	Mortality	728	9	395	18	21	5	11	0	4	0	25	0	2	0	1186	32
Sergipe	Entering	0	0	0	0	0	0	0	0	0	0	0	0	138	4	138	4
	Mortality	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
Tocantins	Entering	0	0	0	0	0	0	0	0	0	0	0	0	62	0	62	0
	Mortality	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

DATA FROM BRAZILIAN STATES

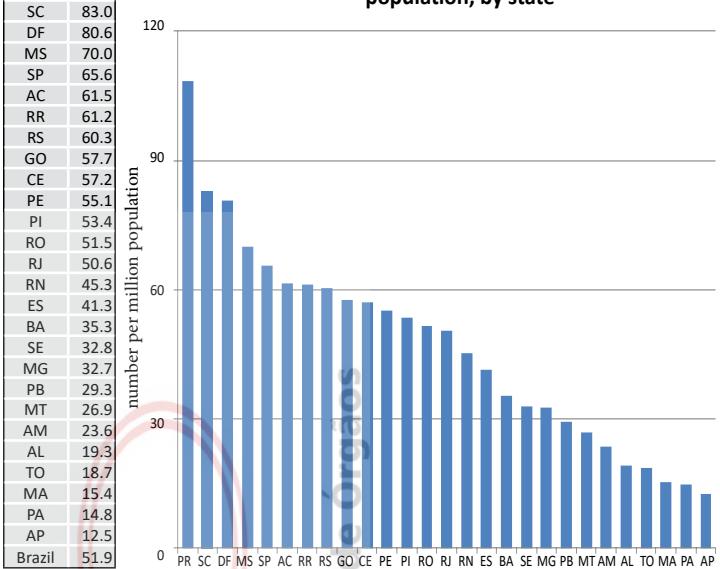
ORGAN DONATION x TRANSPLANTS DURING YEAR 2018

State	Total
SP	2.957
PR	1.227
RJ	846
MG	691
RS	683
SC	581
BA	541
PE	522
CE	516
GO	391
DF	245
MS	190
PI	172
ES	166
RN	159
PA	124
PB	118
MA	108
AM	96
RO	93
MT	90
SE	75
AL	65
AC	51
RR	32
TO	29
AP	10
Brazil	10.778

Number of notifications of potential donors, by state

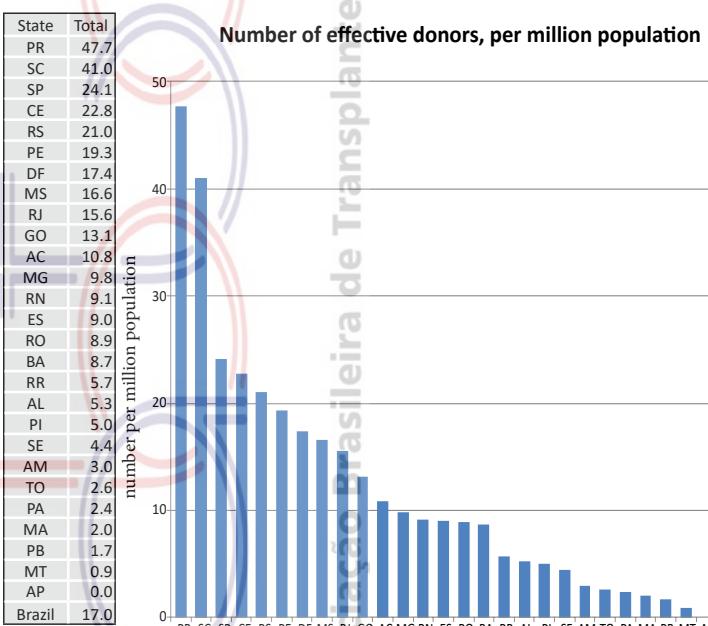
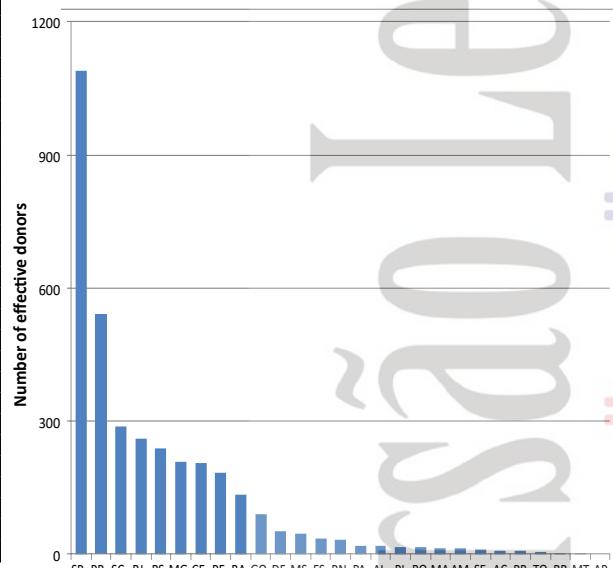


Number of notifications of potential donors, per million population, by state



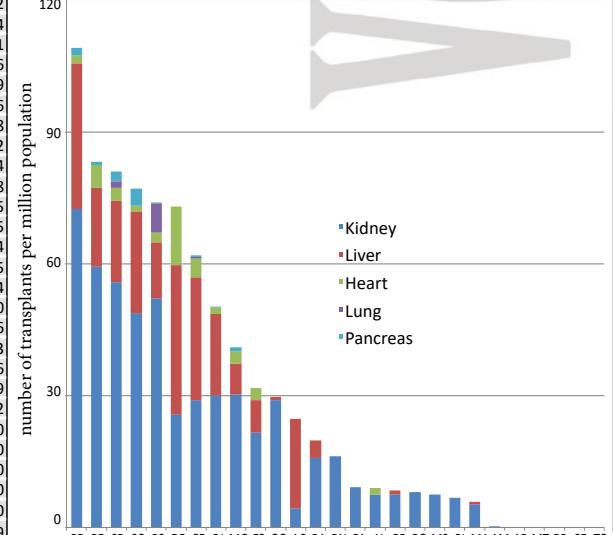
State	Total
SP	1.089
PR	540
SC	287
RJ	261
RS	238
MG	207
CE	206
PE	183
BA	133
GO	89
DF	53
MS	45
ES	36
RN	32
PA	20
AL	18
PI	16
RO	16
MA	14
AM	12
SE	10
AC	9
PB	7
TO	4
RR	3
MT	3
AP	0
Brazil	3.531

Number of effective donors by state

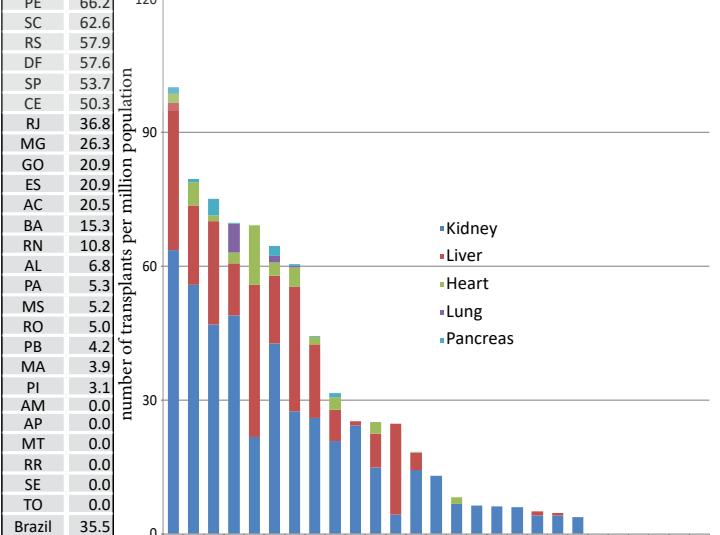


State	Total
PR	90.9
PE	69.2
SP	67.4
SC	64.1
RS	61.6
DF	60.9
CE	51.6
RJ	41.8
MG	34.2
ES	26.4
GO	24.8
AC	20.5
BA	16.5
RN	13.4
PA	7.5
AL	7.4
PB	7.0
RO	6.6
MS	6.3
PI	5.6
MA	4.9
AM	0.2
AP	0.0
MT	0.0
RR	0.0
SE	0.0
TO	0.0
Brazil	41.9

Cumulative number of organ solid transplants per million population



Number of transplants de órgãos (doadores falecidos), por milhão de população



DATA FROM BRAZILIAN STATES

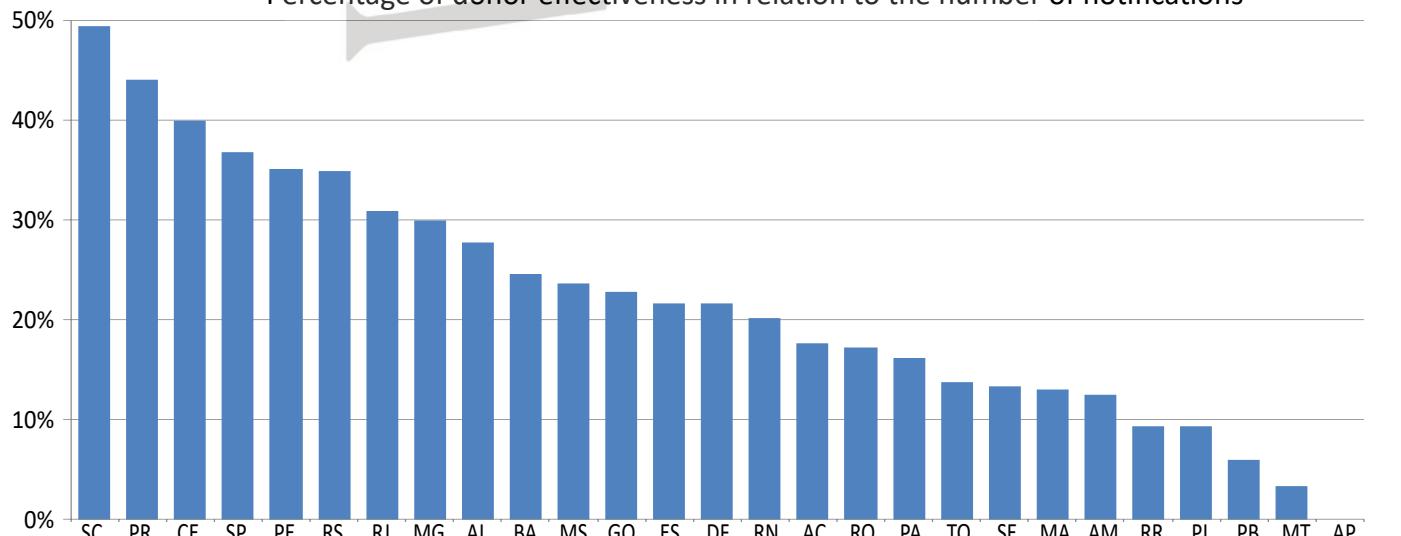
Notifications of potential donors, effective donors and donors whose organs were transplanted by state during the year 2018.

State	Notifications (potential donors)		Refused Donors		Eligible donors		Effective donors		Donors with organs transplanted		Multiple organ donors	
	Nº	pmp/year	Nº	%	Nº	pmp/year	Nº	pmp/year	Nº	pmp/year	Nº	%
Total - Brazil	10,778	51.9	7,247	(67%)	5,881	28.3	3,531	17.0	3,032	14.6	2,021	(67%)
Acre	51	61.5	42	(82%)	40	48.2	9	10.8	5	6.0	3	(60%)
Alagoas	65	19.3	47	(72%)	53	15.7	18	5.3	18	5.3	14	(78%)
Amapá	10	12.5	10	(100%)	0	0.0	0	0.0	0	0.0	0	(0%)
Amazonas	96	23.6	84	(88%)	60	14.8	12	3.0	12	3.0	3	(25%)
Bahia	541	35.3	408	(75%)	380	24.8	133	8.7	133	8.7	85	(64%)
Ceará	516	57.2	310	(60%)	459	50.9	206	22.8	194	21.5	152	(78%)
Distrito Federal	245	80.6	192	(78%)	148	48.7	53	17.4	47	15.5	32	(68%)
Espírito Santo	166	41.3	130	(78%)	117	29.1	36	9.0	35	8.7	29	(83%)
Goiás	391	57.7	302	(77%)	268	39.5	89	13.1	80	11.8	48	(60%)
Maranhão	108	15.4	94	(87%)	75	10.7	14	2.0	11	1.6	4	(36%)
Mato Grosso	90	26.9	87	(97%)	35	10.5	3	0.9	2	0.6	2	(0%)
Mato Grosso do Sul	190	70.0	145	(76%)	160	59.0	45	16.6	43	15.8	30	(70%)
Minas Gerais	691	32.7	484	(70%)	307	14.5	207	9.8	197	9.3	183	(93%)
Pará	124	14.8	104	(84%)	92	11.0	20	2.4	20	2.4	8	(40%)
Paraíba	118	29.3	111	(94%)	63	15.7	7	1.7	6	1.5	5	(83%)
Paraná	1227	108.4	687	(56%)	986	87.1	540	47.7	428	37.8	306	(71%)
Pernambuco	522	55.1	339	(65%)	469	49.5	183	19.3	178	18.8	145	(81%)
Piauí	172	53.4	156	(91%)	76	23.6	16	5.0	14	4.3	11	(79%)
Rio de Janeiro	846	50.6	585	(69%)	724	43.3	261	15.6	220	13.2	153	(70%)
Rio Grande do Norte	159	45.3	127	(80%)	140	39.9	32	9.1	32	9.1	20	(63%)
Rio Grande do Sul	683	60.3	445	(65%)	581	51.3	238	21.0	186	16.4	108	(58%)
Rondonia	93	51.5	77	(83%)	65	36.0	16	8.9	12	6.6	2	(17%)
Roraima	32	61.2	29	(91%)	11	21.0	3	5.7	3	5.7	3	(100%)
Santa Catarina	581	83.0	294	(51%)	504	72.0	287	41.0	219	31.3	166	(76%)
São Paulo	2957	65.6	1868	(63%)	0.0	1089	24.1	923	20.5	497	(54%)	
Sergipe	75	32.8	65	(87%)	48	21.0	10	4.4	10	4.4	8	(80%)
Tocantins	29	18.7	25	(86%)	20	12.9	4	2.6	4	2.6	4	(100%)

Excluding São Paulo state data,

source: State Transplants Centrals

Percentage of donor effectiveness in relation to the number of notifications



DATA FROM BRAZILIAN STATES

Reasons for non-fulfillment of organ donation by notified potential donors during the year 2018.

State	Potential Donors number	Family Interview			Exclusion Reasons							
		Performed	noncon- sent	%	Medical Reasons		Cardiopulmonary arrest		unconfirmed brain death			
					Nº	%	Nº	%	Nº	%		
Total - Brazil	10,778	6,441	2,753 (43%)		1,545 (14%)		988 (9%)		709 (7%)		1,252 (12%)	
Acre	51	25	14	(56%)	16	(31%)	1	(2%)	10	(20%)	1	(2%)
Alagoas	65	39	17	(44%)	10	(15%)	1	(2%)	11	(17%)	8	(12%)
Amapá	10	0	0	(0%)	0	(0%)	0	(0%)	0	(0%)	10	(0%)
Amazonas	96	35	22	(63%)	16	(17%)	1	(1%)	36	(38%)	9	(9%)
Bahia	541	371	207	(56%)	88	(16%)	83	(15%)	0	(0%)	30	(6%)
Ceará	516	322	116	(36%)	136	(26%)	52	(10%)	4	(1%)	2	(0%)
Distrito Federal	245	100	36	(36%)	55	(22%)	0	(0%)	97	(40%)	4	(2%)
Espírito Santo	166	93	40	(43%)	28	(17%)	6	(4%)	43	(26%)	13	(8%)
Goiás	391	260	158	(61%)	77	(20%)	3	(1%)	51	(13%)	13	(3%)
Maranhão	108	45	31	(69%)	29	(27%)	6	(6%)	5	(5%)	23	(21%)
Mato Grosso	90	25	20	(80%)	12	(13%)	6	(7%)	44	(49%)	5	(6%)
Mato Grosso do Sul	190	109	58	(53%)	47	(25%)	1	(1%)	31	(16%)	8	(4%)
Minas Gerais	691	259	173	(67%)	59	(9%)	109	(16%)	10	(1%)	133	(19%)
Pará	124	80	53	(66%)	18	(15%)	3	(2%)	28	(23%)	2	(2%)
Paraíba	118	44	30	(68%)	21	(18%)	5	(4%)	49	(42%)	6	(5%)
Paraná	1227	844	227	(27%)	248	(20%)	102	(8%)	29	(2%)	81	(7%)
Pernambuco	522	339	156	(46%)	122	(23%)	2	(0%)	52	(10%)	7	(1%)
Piauí	172	69	51	(74%)	100	(58%)	1	(1%)	0	(0%)	4	(2%)
Rio de Janeiro	846	350	173	(49%)	108	(13%)	123	(15%)	39	(5%)	142	(17%)
Rio Grande do Norte	159	108	70	(65%)	22	(14%)	12	(8%)	18	(11%)	5	(3%)
Rio Grande do Sul	683	456	195	(43%)	131	(19%)	22	(3%)	93	(14%)	4	(1%)
Rondonia	93	49	29	(59%)	20	(22%)	4	(4%)	19	(20%)	5	(5%)
Roraima	32	11	8	(73%)	5	(16%)	9	(28%)	4	(13%)	3	(9%)
Santa Catarina	581	457	150	(33%)	84	(14%)	40	(7%)	0	(0%)	20	(3%)
São Paulo	2957	1905	689	(36%)	77	(3%)	396	(13%)	0	(0%)	706	(24%)
Sergipe	75	35	23	(66%)	9	(12%)	0	(0%)	27	(36%)	6	(8%)
Tocatins	29	11	7	(64%)	7	(24%)	0	(0%)	9	(31%)	2	(7%)

Source: States Transplants Centrals

DATA FROM BRAZILIAN STATES

Profile: age, gender, cause of death and blood group of the organ donors

State	Gender		Causes of death			Age						Blood group				
	Male	Fem	BT*	CVA**	Others	≤5	6-10	11-17	18-34	35-49	50-64	≥65	A	AB	B	O
TOTAL - Brazil	2126	1405	1151	1889	491	50	33	146	713	939	1231	419	1263	123	370	1775
Percentage	60%	40%	33%	53%	14%	1%	1%	4%	20%	27%	35%	12%	36%	3%	10%	50%
Acre	7	2	3	5	1	0	0	0	3	5	1	0	2	0	2	5
Alagoas	7	11	7	11	0	0	0	3	4	5	3	3	4	2	2	10
Amapá	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Amazonas	8	4	6	5	1	0	0	0	4	4	4	0	6	0	1	5
Bahia	78	55	43	65	25	4	0	9	29	37	43	11	36	3	21	73
Ceará	134	72	118	75	13	1	1	16	60	57	44	27	74	6	21	105
Distrito Federal	38	15	24	14	15	3	1	6	17	13	13	0	15	3	4	31
Espírito Santo	21	15	17	15	4	1	0	2	12	8	12	1	13	3	4	16
Goiás	57	32	34	36	19	1	1	5	17	31	28	6	36	1	14	38
Maranhão	9	5	8	4	2	0	0	0	6	3	5	0	5	0	1	8
Mato Grosso	3	0	3	0	0	0	0	1	1	1	0	0	0	0	0	3
Mato Grosso do Sul	28	17	20	22	3	0	0	2	11	12	14	6	13	1	6	25
Minas Gerais	122	85	46	142	19	2	5	13	56	61	60	10	78	7	28	94
Pará	17	3	15	5	0	0	0	1	8	8	2	1	6	0	2	12
Paraíba	3	4	4	0	3	0	0	1	4	2	0	0	1	0	0	6
Paraná	319	221	150	258	132	8	4	23	84	116	205	100	201	36	41	262
Pernambuco	115	68	82	91	10	0	3	3	49	57	56	15	64	8	13	98
Piauí	11	5	10	5	1	0	0	0	5	5	6	0	6	0	3	7
Rio de Janeiro	163	98	71	126	64	4	0	17	43	60	100	37	97	2	26	136
Rio Grande do Norte	22	10	12	17	3	0	0	3	7	8	11	3	7	0	8	17
Rio Grande do Sul	125	113	62	148	28	6	4	8	36	45	95	44	91	7	24	116
Rondonia	15	1	7	6	3	0	0	1	6	5	4	0	5	0	3	8
Roraima	2	1	1	1	1	0	1	0	1	0	1	0	3	0	0	0
Santa Catarina	174	113	86	156	45	3	4	3	57	72	99	49	118	6	28	135
São Paulo	642	447	316	676	97	17	8	29	187	320	423	105	377	38	115	559
Sergipe	5	5	4	5	1	0	0	0	5	3	1	1	3	0	3	4
Tocantins	1	3	2	1	1	0	1	0	1	1	1	0	2	0	0	2

Source: States Transplants Centrals

BT* Brain Trauma

**CVA - Cerebro vascular accident

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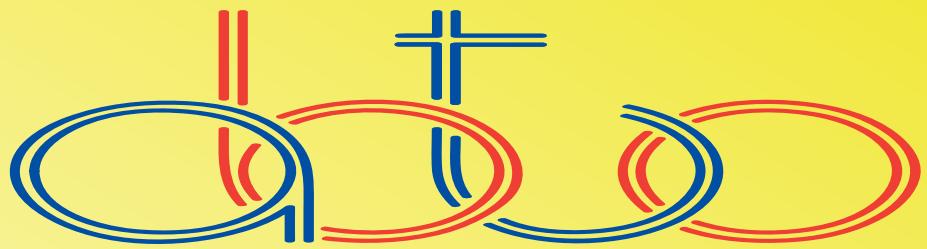
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