

Swiss Transplant Cohort Study Report (January 2008 - December 2020)

July 2021

Sanda Branca-Dragan, Michael Koller, Susanne Stampf, Juliane Rick, Katell Mellac, Simona Rossi and Jürg Steiger on behalf of all members of the STCS

Contact information:

Michael Koller and Jürg Steiger
Petersgraben 4
CH-4031 Basel
Phone +41 61 26 52525
Fax +41 61 26 52410
Direct calling +41 61 32 86404 or +41 61 32 86737
michael.koller@usb.ch, juerg.steiger@usb.ch

Disclaimer

The STCS Annual Report covers all solid organ transplantation (SOT) activities on the Swiss national level since January 2008. The report is comprehensive and contains all combinations of simultaneous solid organ transplantations, consecutive transplantations, centre-specific activities and key outcomes of all transplantation programs including limited reporting of infectious disease and cancer occurrence. To serve the aim of comprehensive transplant outcome reporting, the report is based on unselected patient populations of the different transplant programs and transplant centres. **However, it is important to note that the report is not designed for and does not serve the purpose of center-specific outcomes comparison.**

The Swiss Transplant Cohort Study (STCS)

List of Abbreviations

STCS	Swiss Transplant Cohort Study
BE	Inselspital Bern
CHUV	Centre Hospitalier Universitaire Vaudois Lausanne
CI	confidence interval
CumInc	cumulative incidence
FUP	follow-up
GF	graft failure
HSCT	haematopoietic stem cell transplantation
HUG	Hôpitaux Universitaires de Genève
ID	infectious disease
KPD	kidney paired donation (cross-over living donation)
DBD	donation after brain death
DCD	donation after cardiac death (non-heart-beating donor, NHBD)
SG	Kantonsspital St. Gallen
USZ	Universitätsspital Zürich
USB	Universitätsspital Basel
Tpx	transplantation

List of Figures

1	Quarterly patient enrolment by donor type	7
2	Cumulative patient enrolment	7
3	Cumulative patient enrolment by Tpx type	8
4	Cumulative patient enrolment by center	8
5	Number of patients enrolled by Tpx type	11
6	Number of patients with first single Kidney Tpx	11
7	Number of patients with first STCS Liver, Lung, Heart, Pancreas or Islets Tpx	12
8	Number of single Kidney Tpx	13
9	Number of single Liver Tpx	13
10	Distribution of donor types in all single Kidney Tpx	14
11	Cumulative KPD patient enrolment by centre	14
12	Distribution of donor types in all single Liver Tpx	15
13	Patients current consent status	16
14	Current patients' consent status by centre	16
15	Number of bio-samples in STCS	18
16	Distribution of number of aliquots by sample type	19
17	Number of samples by follow-up period	19
18	Rate of infectious disease events by pathogen and Tpx type	21
19	Number of Tpx with 6 month FUP	22
20	Number of Tpx with 12 month FUP	22
21	Overall survival	24
22	Overall survival for frequent Tpx types	25
23	Overall survival for frequent Tpx	28
24	Overall survival for patients with first STCS Kidney Tpx by donor type	33
25	Overall survival for patients with first STCS Kidney Tpx by donor type stratified by ABO compatibility	33
26	Graft failure free survival by major Tpx	37
27	Graft failure free survival by major Tpx and centre	38
28	Graft failure free survival in patients with first STCS single Kidney Tpx by donor type (stratified by ABO compatibility)	39
29	Cumulative incidence of graft failure	40
30	Cumulative incidence of graft failure for single Kidney Tpx by donor type	41
31	Cumulative incidence of graft failure for kidneys in single Tpx stratified by ABO compatibility	41
32	Cumulative incidence of graft failure in Kidney Tpx recipients by HLA mismatches	49
33	Cumulative incidence of graft failure in Liver Tpx recipients by HLA mismatches	50
34	Cumulative incidence of graft failure in Lung Tpx recipients by HLA mismatches	51
35	Cumulative incidence of graft failure in Heart Tpx recipients by HLA mismatches	52
36	Cumulative Kidney DCD patient enrolment by centre	56
37	Graft failure free survival in patients with first STCS Kidney Tpx by donor type	57
38	Cumulative incidence of graft failure for Kidney Tpx by donor type	57
39	Cumulative Liver DCD patient enrolment by centre	58
40	Overall survival in patients with first STCS Liver Tpx by donor type	59

List of Tables

1	Number of patients enrolled	4
2	Number of patients enrolled by Tpx type	4
3	Number of Tpx types	5
4	Number of transplanted organs	5
5	Patients' characteristics for major Tpx types	6
6	Donors' characteristics by donor types	6
7	Number of enrolled patients by year and centre	9
8	Number of Tpx by year and centre	9
9	Number of organs by year and centre	10
10	Patients' current consent against consent status at enrolment	17
11	Number of patients with bio-samples	18
12	Patients with infectious disease events	20
13	Summary of infectious disease events	20
14	Follow-up information of patients	23
15	Number of patients who dropped out by Tpx type	23
16	Overall mortality	24
17	Overall mortality by Tpx type	26
18	Overall mortality by frequent Tpx type and centre	29
19	Overall mortality in (single) kidney recipients by donor type	34
20	Summary for graft failures	35
21	Graft failures in double Tpx	35
22	Graft failure and related patients' death	36
23	Number of organs with primary non-function	36
24	Graft failure by organ	42
25	Graft failure by organ and centre	44
26	Graft failure of kidneys (in first STCS single Tpx) by donor type	48
27	Overview of patients with incident cancer	53
28	Patients with incident cancer	53
29	Overview of incident cancer occurrence	54
30	Overview of patients with incident skin cancer	55
31	Patients with incident skin cancer	55
32	Overview of incident skin cancer occurrence	55
33	Kidney patients' characteristics by donor type	56
34	Liver patients' characteristics by donor type	58
35	Number of pediatric patients (under 18) by first Tpx type	60
36	Number of Tpx in pediatric patients by organ and centre	60
37	Overall mortality by rare Tpx scenarios	61
38	Overall mortality by rare Tpx scenarios and centre	62

Contents

1 Comments from the centres	1
1.1 Inselspital Bern	1
1.2 Centre Hospitalier Universitaire Vaudois Lausanne	1
1.3 Hôpitaux Universitaires de Genève	1
1.4 Kantonsspital St. Gallen	1
1.5 Universitätsspital Basel	1
1.6 Universitätsspital Zürich	1
2 News and updates	2
3 Patients, transplantations and transplanted organs	3
3.1 Definitions applied	3
3.2 Overview and baseline demographic data	4
3.3 STCS patient enrolment by calendar time	7
3.4 Transplantation activities by centre and year	9
3.5 Kidney transplantations by centre	11
3.6 Transplantations other than Kidney by centre	12
3.7 Single Kidney and Liver transplantation by donor type	13
4 Consent status	16
5 Bio-samples	18
6 Infectious disease events	20
7 Follow-up	22
8 Mortality	23
8.1 Overall	23
8.2 Mortality by transplantation	25
8.3 Mortality by Tpx and centre	28
8.4 Mortality in first single Kidney transplantation	33
9 Graft failure and primary non-function	35
9.1 Graft failure	35
9.2 Graft failure free survival	37
9.3 Cumulative incidence of graft failure	40
9.4 Graft failure and number of HLA mismatches	49
10 Cancer	53
10.1 Cancer other than skin	53
10.2 Skin cancer	55

11 Specific Populations	56
11.1 DCD Donor Kidney Recipients	56
11.2 DCD Donor Liver Recipients	58
11.3 Pediatric patients	60
A Mortality in patients with rare Tpx scenarios	61
B Technical summary	63

1 Comments from the centres

1.1 Inselspital Bern

Approves open publication.

1.2 Centre Hospitalier Universitaire Vaudois Lausanne

Approves open publication.

1.3 Hôpitaux Universitaires de Genève

Approves open publication.

1.4 Kantonsspital St. Gallen

Approves open publication.

1.5 Universitätsspital Basel

Approves open publication.

1.6 Universitätsspital Zürich

Approves open publication.

2 News and updates

News:

- The retrospectively captured patients, from January to April 2008, are now included throughout the report. The STCS officially started to enrol patients on 1 May 2008. By request from the Swiss Federal Office of Public Health, patients transplanted in the reporting period from 1 January 2008 until 30 April 2008 were retrospectively added to the STCS with only "mini-minimal" data captured. All these patients had "NA: retrospectively captured patient" as consent status at enrolment and more details related to their latest consent status are available in the Table 10.
- A new summary of donor characteristics is available in Table 6.
- An overview of enrolled patients, performed transplantations and transplanted organs by year and centre is presented in Table 7, Table 8 and Table 9.
- Ten patients that had both solid organ transplantation and haematopoietic stem cell transplantation (HSCT) are currently included in the report. The number of patients with HSCT prior to enrolment is included in Table 1.
- Kidney-Kidney transplantation (Tpx) are considered as Kidney Tpx throughout the report. Also the Kidney-Kidney-Pancreas Tpx are now included in Kidney-Pancreas Tpx.
- Islets reperfusions are included as Islets Tpx throughout the report.

3 Patients, transplantations and transplanted organs

3.1 Definitions applied

- Enrolment refers to the inclusion of all patients into the Swiss Transplant Cohort Study (STCS) from 1 January 2008 until 31 December 2020. From those patients, the follow-up information from the date of transplantation until end of follow-up is included in the report.
- First transplantation:
 - Patients with a first transplantation in their medical history at the time of STCS enrolment
- Re-transplantation:
 - Patients with a repetition of the same type of transplantation (Re-Tpx)
 - Example: Re-Tpx of a kidney allograft after failure of a previous kidney graft
- Second transplantation:
 - Patients with a second transplantation that differs from the preceding transplantation type
 - Example: Transplantation of a pancreas following a single Kidney transplantation
- Simultaneous transplantation:
 - Simultaneous (eg double or triple) transplantation refer to multiple organs that originate from the same donor (e.g. Kidney-Pancreas).
 - Simultaneous transplantation can be categorized as first, re- or second transplantation.
- Every transplant procedure can consist of a single or simultaneous transplantation.
- Knowledge on previous transplantation from the pre-STCS era (before May 2008) is considered. Patients may thus be enrolled within the STCS as a re- or a second transplantation.
- Sequences of previous Islets transplantations have been counted as one prior transplantation.
- Human stem cell transplantations are not considered in this report.

3.2 Overview and baseline demographic data

The following tables list the number of patients enrolled in the STCS, the number of transplantations performed, and organs transplanted. Table 1 and 2 show patients according to their first STCS transplantation.

Table 1: Number of patients enrolled

	Patients	(%)
Total number	6311	100.0
Single Tpx at enrolment	6072	96.2
Double Tpx at enrolment	237	3.8
Triple Tpx at enrolment	2	0.0
1st Tpx at enrolment	5678	90.0
Re-Tpx at enrolment	530	8.4
2nd Tpx at enrolment	103	1.6
HSCT Tpx prior to enrolment	24	0.4

Table 2: Number of patients enrolled by Tpx type

	Total	First Tpx	(%)	Re Tpx	(%)	Second Tpx	(%)
Total	6311	5678	90.0	530	8.4	103	1.6
Kidney	3598	3089	85.9	458	12.7	51	1.4
Liver	1386	1340	96.7	40	2.9	6	0.4
Lung	564	548	97.2	13	2.3	3	0.5
Heart	469	463	98.7	5	1.1	1	0.2
Islets	40	11	27.5	11	27.5	18	45.0
Pancreas	13	7	53.8	0	0.0	6	46.2
Small bowel	2	1	50.0	1	50.0	0	0.0
Kidney - Pancreas	133	126	94.7	1	0.8	6	4.5
Kidney - Liver	55	47	85.5	0	0.0	8	14.5
Kidney - Islets	23	22	95.7	0	0.0	1	4.3
Kidney - Heart	14	12	85.7	1	7.1	1	7.1
Kidney - Lung	2	1	50.0	0	0.0	1	50.0
Liver - Lung	4	4	100.0	0	0.0	0	0.0
Liver - Pancreas	1	1	100.0	0	0.0	0	0.0
Heart - Lung	1	1	100.0	0	0.0	0	0.0
Islets - Liver	1	1	100.0	0	0.0	0	0.0
Pancreas - Small bowel	3	3	100.0	0	0.0	0	0.0
Kidney - Islets - Liver	1	0	0.0	0	0.0	1	100.0
Islets - Liver - Lung	1	1	100.0	0	0.0	0	0.0

In contrast to Table 1 and 2, Table 3 and 4 list all transplantations performed and the number of transplanted organs.

Table 3: Number of Tpx types

	Total	First Tpx	(%)	Re Tpx	(%)	Second Tpx	(%)
Total	6663	5678	85.2	794	11.9	191	2.9
Kidney	3711	3089	83.2	546	14.7	76	2.0
Liver	1506	1340	89.0	152	10.1	14	0.9
Lung	583	548	94.0	31	5.3	4	0.7
Heart	474	463	97.7	10	2.1	1	0.2
Islets	117	11	9.4	50	42.7	56	47.9
Pancreas	23	7	30.4	1	4.3	15	65.2
Small bowel	2	1	50.0	1	50.0	0	0.0
Kidney - Pancreas	135	126	93.3	2	1.5	7	5.2
Kidney - Liver	56	47	83.9	0	0.0	9	16.1
Kidney - Islets	25	22	88.0	0	0.0	3	12.0
Kidney - Heart	14	12	85.7	1	7.1	1	7.1
Kidney - Lung	3	1	33.3	0	0.0	2	66.7
Liver - Lung	4	4	100.0	0	0.0	0	0.0
Liver - Pancreas	1	1	100.0	0	0.0	0	0.0
Heart - Lung	1	1	100.0	0	0.0	0	0.0
Islets - Liver	2	1	50.0	0	0.0	1	50.0
Pancreas - Small bowel	3	3	100.0	0	0.0	0	0.0
Kidney - Islets - Liver	1	0	0.0	0	0.0	1	100.0
Liver - Pancreas - Small bowel	1	0	0.0	0	0.0	1	100.0
Islets - Liver - Lung	1	1	100.0	0	0.0	0	0.0

'Liver - Pancreas - Small bowel' Tpx type was not performed as first STCS Tpx.

Table 4: Number of transplanted organs

	Total	First Tpx	(%)	Re Tpx	(%)	Second Tpx	(%)
Total	6913	5898	85.3	874	12.6	141	2.0
Kidney	3945	3297	83.6	576	14.6	72	1.8
Liver	1572	1394	88.7	158	10.1	20	1.3
Lung	592	555	93.8	32	5.4	5	0.8
Heart	489	476	97.3	12	2.5	1	0.2
Pancreas	163	137	84.0	11	6.7	15	9.2
Islets	146	35	24.0	83	56.8	28	19.2
Small bowel	6	4	66.7	2	33.3	0	0.0

Table 5: Patients' characteristics for major Tpx types

	Total*	Kidney	Liver	Lung	Heart	Kidney - Pancreas
Total no. patients	6150	3598	1386	564	469	133
Age (yrs), median	54.3 (42.1-62.1)	54.4 (42.7-63.1)	56.1 (46-62.3)	54.3 (37.6-60.4)	51.0 (36.5-59.2)	44.4 (36.9-51)
- IQR	0.05; 82.2	1.53; 82.2	0.05; 78	4.37; 70.3	0.07; 71.3	23.38; 64.6
- min; max	3911 (63.6%)	2288 (63.6%)	933 (67.3%)	285 (50.5%)	330 (70.4%)	75 (56.4%)
Male gender, n (%)	321 (5.2%)	143 (4%)	112 (8.1%)	18 (3.2%)	48 (10.2%)	0 (0%)
Pediatric, n (%)						
Observation time (yrs), median	4.8	5.2	4.0	3.9	4.0	6.8
- IQR	(2.2-8.3)	(2.6-8.7)	(1.6-7.8)	(1.6-6.8)	(1.5-7.8)	(2.7-9.7)
No. deaths, n (%)	1043 (17%)	435 (12.1%)	280 (20.2%)	215 (38.1%)	101 (21.5%)	12 (9%)
No. patients with at least one GF, n (%)	660 (10.7%)	336 (9.3%)	158 (11.4%)	99 (17.6%)	43 (9.2%)	24 (18%)
- with GF, alive	322 (5.2%)	235 (6.5%)	63 (4.5%)	4 (0.7%)	3 (0.6%)	17 (12.8%)
- with GF -> death	188 (3.1%)	92 (2.6%)	51 (3.7%)	25 (4.4%)	13 (2.8%)	7 (5.3%)
- with GF - related death	150 (2.4%)	9 (0.3%)	44 (3.2%)	70 (12.4%)	27 (5.8%)	0 (0%)
Death without GF	705 (11.5%)	334 (9.3%)	185 (13.3%)	120 (21.3%)	61 (13%)	5 (3.8%)
No. patients with any ID	4205 (68.4 %)	2502 (69.5%)	869 (62.7%)	372 (66%)	356 (75.9%)	106 (79.7%)
- any proven/viral ID event	3188 (51.8 %)	1883 (52.3%)	645 (46.5%)	316 (56%)	263 (56.1%)	81 (60.9%)
- any incident cancer other than skin	708 (11.5 %)	390 (10.8%)	217 (15.7%)	71 (12.6%)	25 (5.3%)	5 (3.8%)
- any incident skin cancer	997 (16.2 %)	673 (18.7%)	164 (11.8%)	83 (14.7%)	62 (13.2%)	15 (11.3%)

(*) "Total" refers to the total number of patients with Tpx presented in this table

Table 6: Donors' characteristics by donor types

	Total	Brain dead (DBD)	NHBD (DCD)	KPD	Living related	Living unrelated
Total no. donors	3377	1667	223	47	705	735
Donor age (yrs), median	54 (42.3-63.7)	53.0 (36.3-66)	59.2 (50.1-66.7)	51.4 (46.3-61.2)	53.0 (44-61)	54.7 (46.7-62.5)
- IQR	0; 88.4	0; 88.4	11.49; 87.4	24.5; 72.5	1.6; 81.2	0; 79.7
- min; max	1635 (48.4%)	929 (55.7%)	154 (69.1%)	21 (44.7%)	283 (40.9%)	248 (34.2%)
Male gender, n (%)	1	3	2	1	1	1
No. organs donated, median	1; 7	1; 7	1; 5	-	-	-
- min; max						

3.3 STCS patient enrolment by calendar time

Figure 1 shows the patient enrolment activity by quarter from January 2008 till December 2020.

Figure 1: Quarterly patient enrolment by donor type

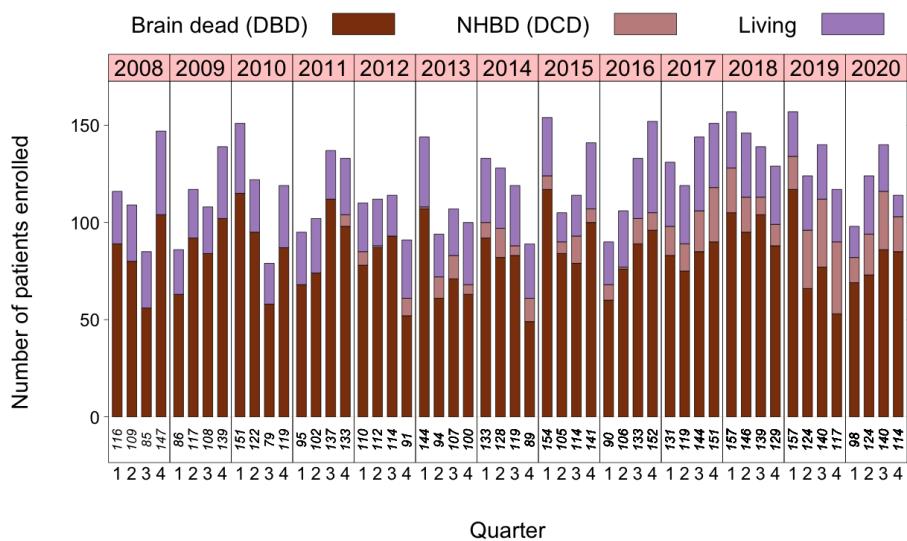


Figure 2: Cumulative patient enrolment

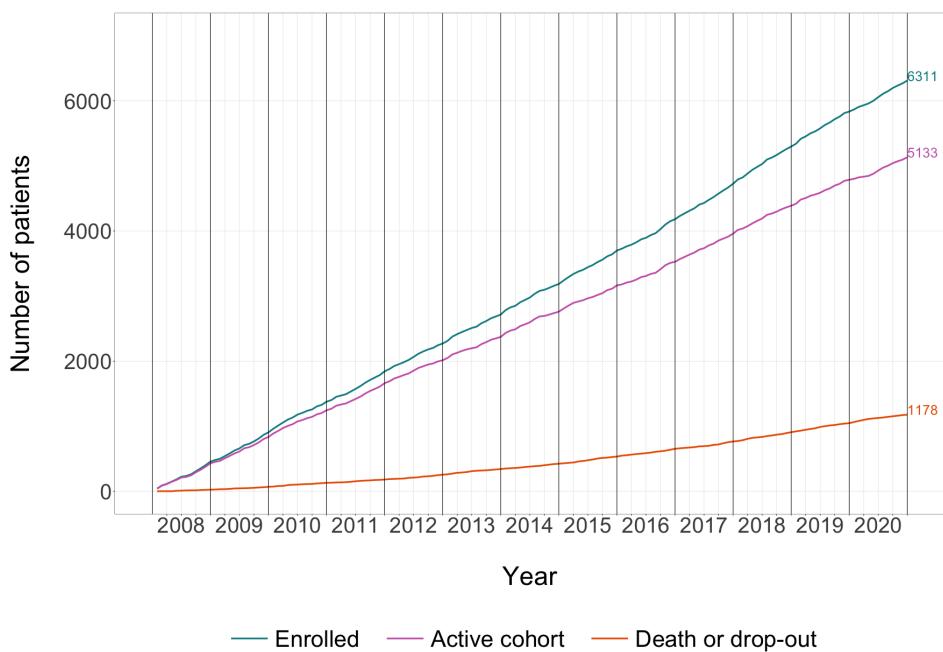
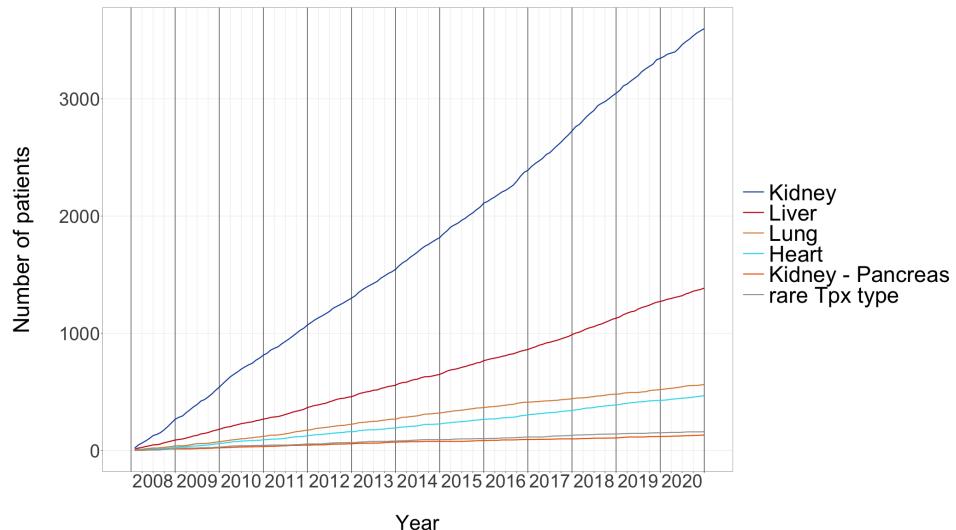
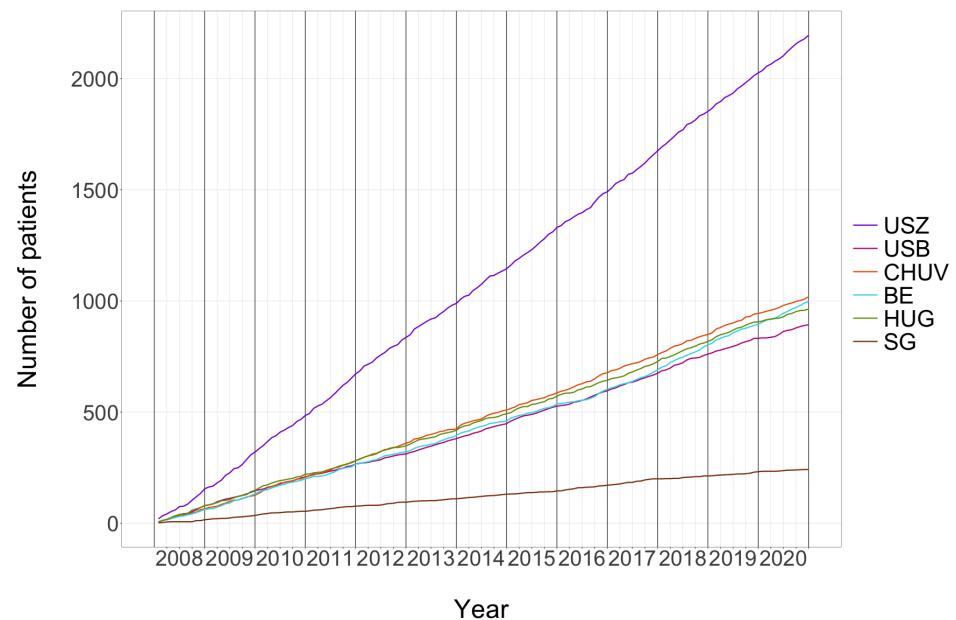


Figure 3: Cumulative patient enrolment by Tpx type



'Rare Tpx type' includes: Islets, Pancreas, Small bowel, Kidney - Liver, Kidney - Islets, Kidney - Heart, Kidney - Lung, Liver - Lung, Liver - Pancreas, Heart - Lung, Islets - Liver, Pancreas - Small bowel, Kidney - Islets - Liver, Islets - Liver - Lung.

Figure 4: Cumulative patient enrolment by center



3.4 Transplantation activities by centre and year

Table 7: Number of enrolled patients by year and centre

	Total	USZ	%	USB	%	CHUV	%	BE	%	HUG	%	SG	%
Total	6311	2195	34.8	893	14.1	1019	16.1	998	15.8	964	15.3	242	3.8
2020	476	169	35.5	61	12.8	75	15.8	103	21.6	58	12.2	10	2.1
2019	538	173	32.2	71	13.2	95	17.7	92	17.1	88	16.4	19	3.5
2018	571	178	31.2	86	15.1	90	15.8	113	19.8	91	15.9	13	2.3
2017	545	184	33.8	79	14.5	82	15	87	16	84	15.4	29	5.3
2016	481	160	33.3	69	14.3	90	18.7	66	13.7	71	14.8	25	5.2
2015	514	186	36.2	79	15.4	78	15.2	77	15	79	15.4	15	2.9
2014	469	156	33.3	67	14.3	85	18.1	65	13.9	75	16	21	4.5
2013	445	153	34.4	69	15.5	64	14.4	74	16.6	70	15.7	15	3.4
2012	427	164	38.4	45	10.5	78	18.3	55	12.9	67	15.7	18	4.2
2011	467	187	40	58	12.4	74	15.8	65	13.9	60	12.8	23	4.9
2010	471	165	35	63	13.4	82	17.4	69	14.6	73	15.5	19	4
2009	450	165	36.7	67	14.9	61	13.6	70	15.6	68	15.1	19	4.2
2008	457	155	33.9	79	17.3	65	14.2	62	13.6	80	17.5	16	3.5

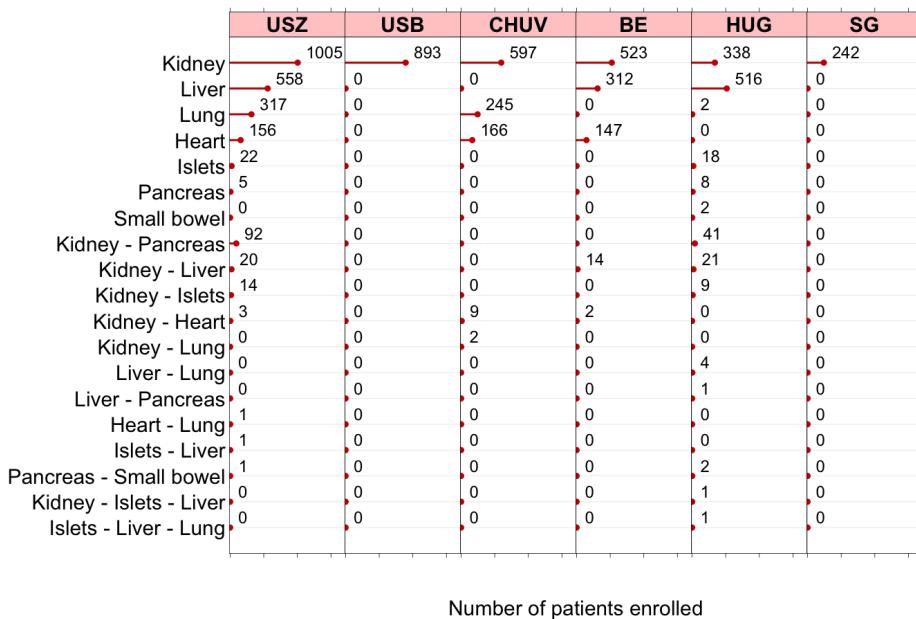
Table 8: Number of Tpx by year and centre

	Total	USZ	%	USB	%	CHUV	%	BE	%	HUG	%	SG	%
Total	6663	2332	35	909	13.6	1053	15.8	1061	15.9	1060	15.9	248	3.7
2020	519	182	35.1	65	12.5	79	15.2	112	21.6	70	13.5	11	2.1
2019	582	179	30.8	73	12.5	101	17.4	108	18.6	102	17.5	19	3.3
2018	599	186	31.1	91	15.2	90	15	121	20.2	98	16.4	13	2.2
2017	578	197	34.1	79	13.7	86	14.9	93	16.1	93	16.1	30	5.2
2016	503	171	34	69	13.7	91	18.1	72	14.3	74	14.7	26	5.2
2015	555	199	35.9	81	14.6	83	15	82	14.8	94	16.9	16	2.9
2014	504	178	35.3	68	13.5	88	17.5	67	13.3	81	16.1	22	4.4
2013	471	167	35.5	69	14.6	66	14	78	16.6	76	16.1	15	3.2
2012	448	173	38.6	45	10	81	18.1	56	12.5	75	16.7	18	4
2011	492	197	40	60	12.2	76	15.4	71	14.4	64	13	24	4.9
2010	487	174	35.7	63	12.9	83	17	69	14.2	79	16.2	19	3.9
2009	466	173	37.1	67	14.4	64	13.7	70	15	73	15.7	19	4.1
2008	459	156	34	79	17.2	65	14.2	62	13.5	81	17.6	16	3.5

Table 9: Number of organs by year and centre

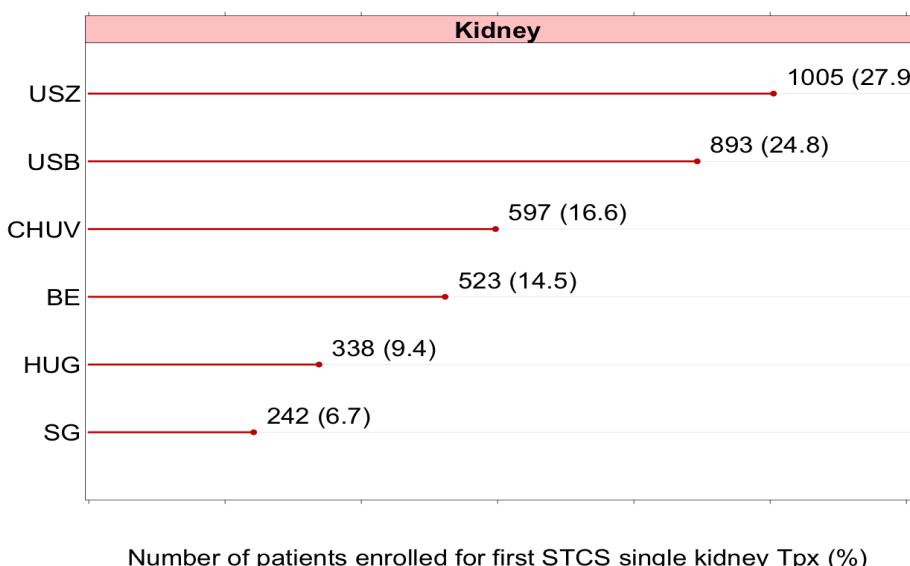
	Total	USZ	%	USB	%	CHUV	%	BE	%	HUG	%	SG	%
Total	6913	2468	35.7	909	13.1	1065	15.4	1077	15.6	1146	16.6	248	3.6
2020	542	192	35.4	65	12	82	15.1	113	20.8	79	14.6	11	2
2019	603	190	31.5	73	12.1	101	16.7	110	18.2	110	18.2	19	3.2
2018	617	194	31.4	91	14.7	92	14.9	123	19.9	104	16.9	13	2.1
2017	595	206	34.6	79	13.3	88	14.8	95	16	97	16.3	30	5
2016	522	181	34.7	69	13.2	91	17.4	73	14	82	15.7	26	5
2015	570	204	35.8	81	14.2	83	14.6	82	14.4	104	18.2	16	2.8
2014	523	186	35.6	68	13	88	16.8	69	13.2	90	17.2	22	4.2
2013	495	184	37.2	69	13.9	67	13.5	79	16	81	16.4	15	3
2012	468	184	39.3	45	9.6	84	17.9	56	12	81	17.3	18	3.8
2011	510	209	41	60	11.8	76	14.9	72	14.1	69	13.5	24	4.7
2010	508	188	37	63	12.4	83	16.3	70	13.8	85	16.7	19	3.7
2009	482	182	37.8	67	13.9	65	13.5	72	14.9	77	16	19	3.9
2008	478	168	35.1	79	16.5	65	13.6	63	13.2	87	18.2	16	3.3

Figure 5: Number of patients enrolled by Tpx type



3.5 Kidney transplantations by centre

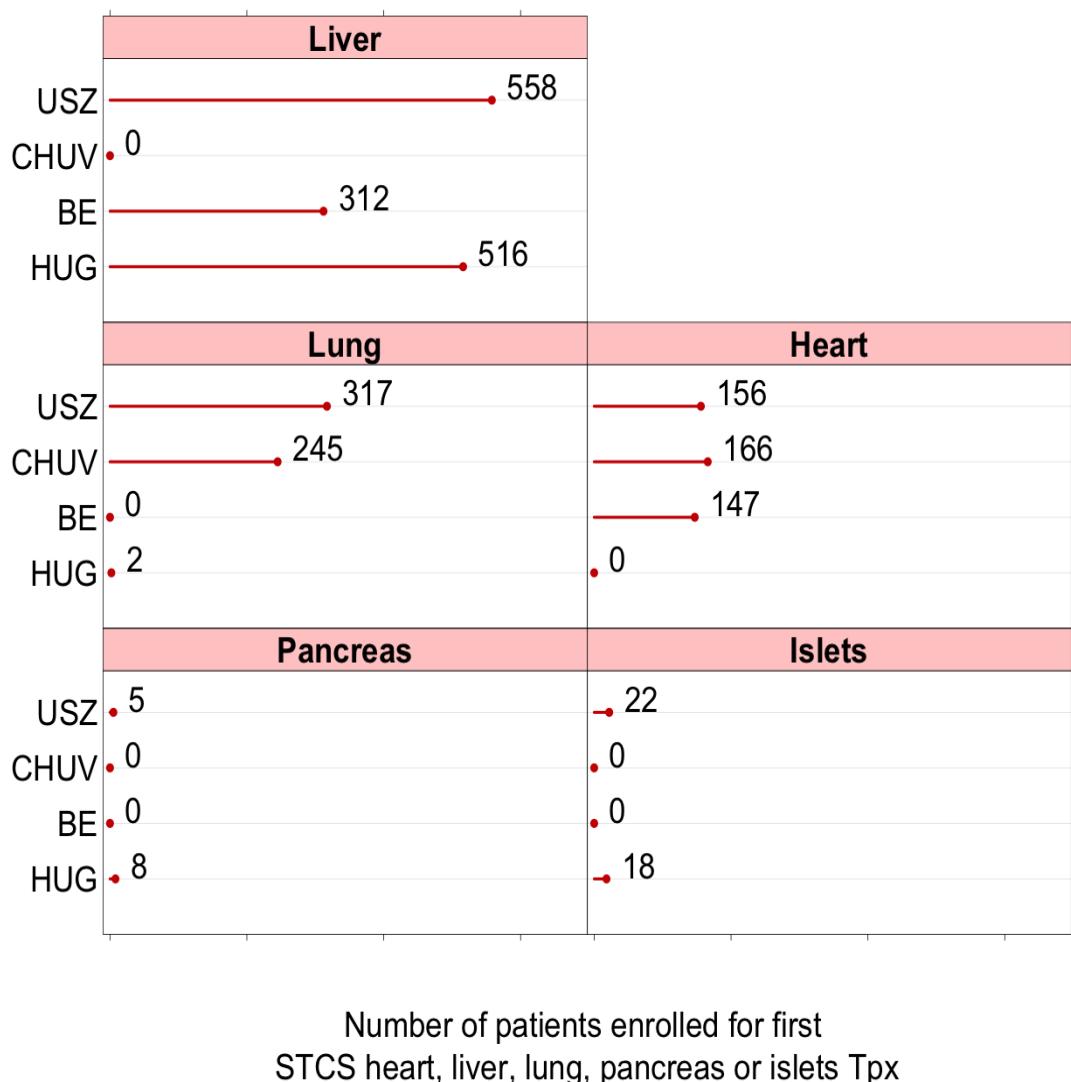
Figure 6: Number of patients with first single Kidney Tpx



3.6 Transplantations other than Kidney by centre

Data from following rare transplantations are not shown: Small bowel (2, HUG), Liver - Lung (4, HUG), Liver - Pancreas (1, HUG), Heart - Lung (1, USZ), Islets - Liver (1, USZ), Pancreas - Small bowel (1, USZ; 2, HUG) and Islets - Liver - Lung (1, HUG).

Figure 7: Number of patients with first STCS Liver, Lung, Heart, Pancreas or Islets Tpx



3.7 Single Kidney and Liver transplantation by donor type

Figures 8 and 9 show all STCS single Kidney and Liver transplantation by donor type (donation after brain death (DBD), donation after cardiac death (non-heart-beating donor, NHBD) (DCD), Living related, Living unrelated, kidney paired donation (cross-over living donation) (KPD) - only in Kidney Tpx). Figures 10 and 12 present proportions of donor types in all single Kidney and Liver transplantation within centres.

Figure 8: Number of single Kidney Tpx

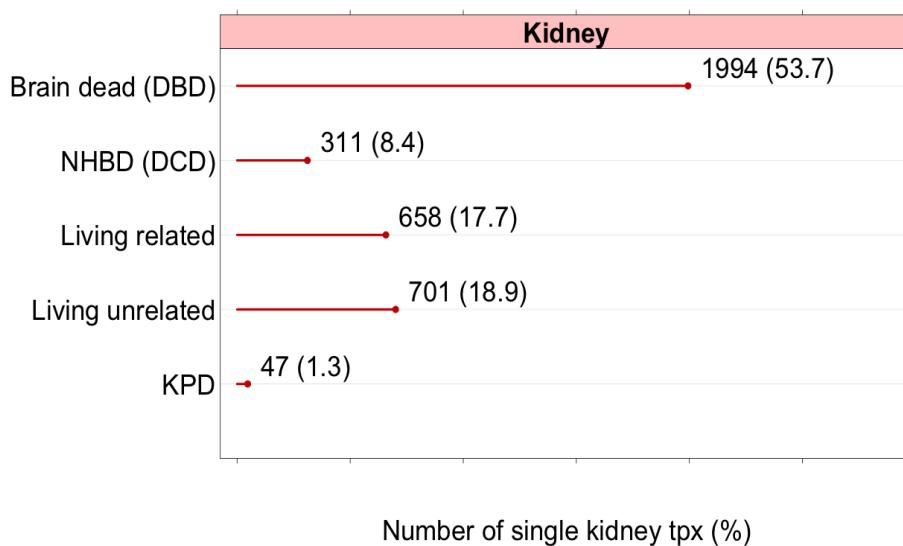


Figure 9: Number of single Liver Tpx

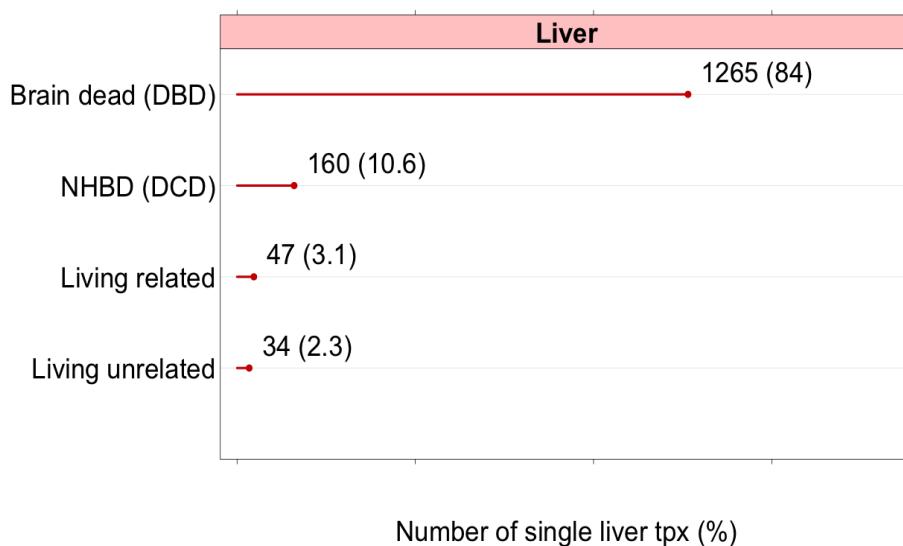


Figure 10: Distribution of donor types in all single Kidney Tpx

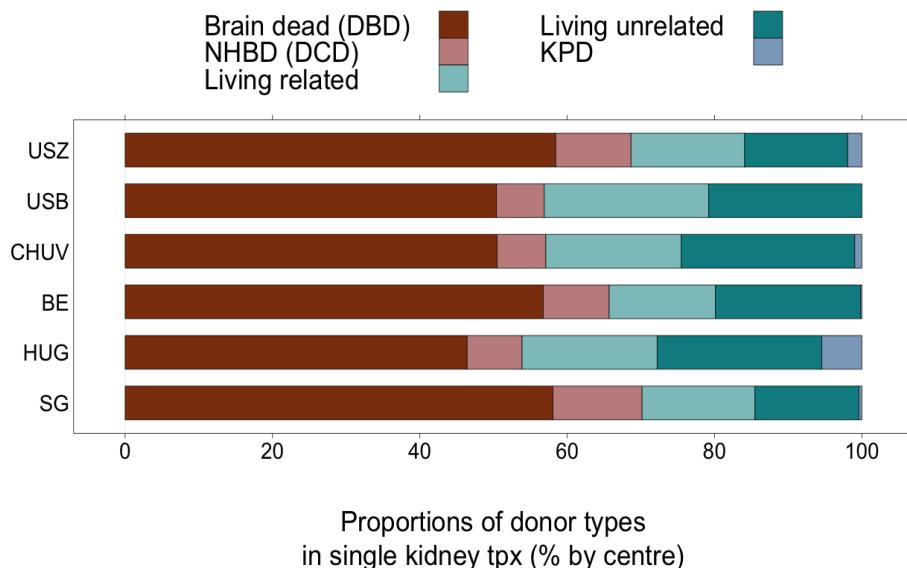


Figure 11: Cumulative KPD patient enrolment by centre

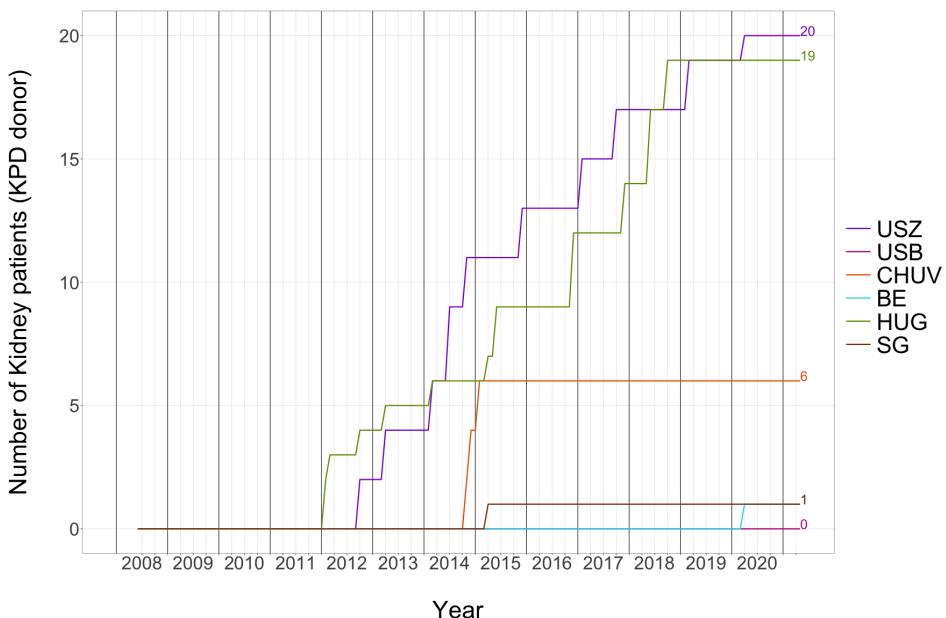
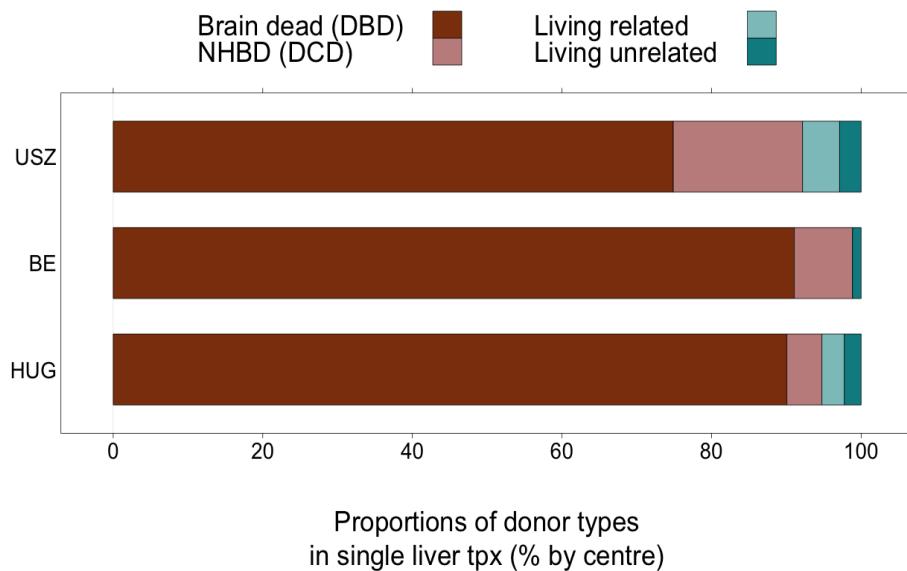


Figure 12: Distribution of donor types in all single Liver Tpx



4 Consent status

Figure 13 presents the latest known consent status - current consent status. In Figure 14, current consent status is given proportionally within each centre. Table 10 shows patients' consent status change over time from enrolment to the current date.

Figure 13: Patients current consent status

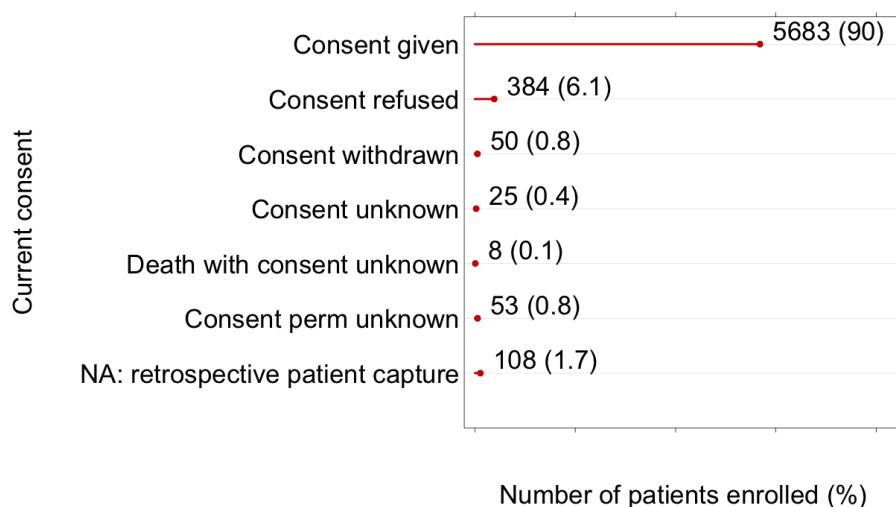


Figure 14: Current patients' consent status by centre

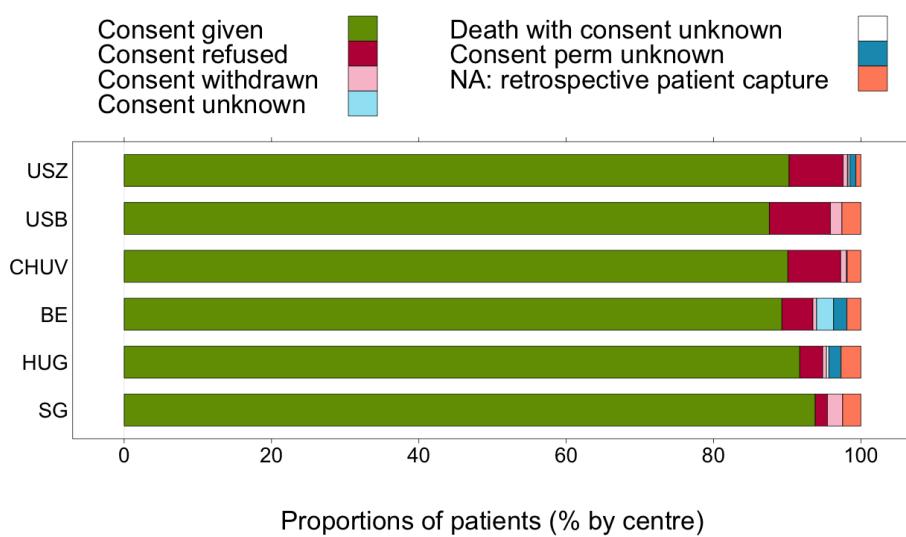


Table 10: Patients' current consent against consent status at enrolment

	Total	C-Given	C-Refused	C-Withdrawn	C-Unknown	C-Death with consent unknown	C-Perm unknown	C-NA: RCP
Total	6311	5683	384	50	25	8	53	108
E-Given	5263	5215	-	46	-	-	2	-
E-Refused	317	24	292	1	-	-	-	-
E-Unknown	570	437	56	3	25	8	41	-
E-Perm unknown	10	-	-	-	-	-	10	-
E-NA: RCP	151	7	36	-	-	-	-	108

Remarks: 'C' stands for 'current consent status' and 'E' denotes the consent status at enrolment.
 'Perm unknown' - 'Permanently unknown'.
 'NA: RCP' - 'NA consent - retrospectively captured patients'.

Patients changing consent status between 'E-Consent given' and 'C-Consent permanently unknown' were initially paediatric patients re-consented at age of majority.

All patients changing consent status between 'E-Consent refused' or 'E-Consent unknown' and 'C-Consent withdrawn' had also a 'Consent given' between enrolment and current date.

5 Bio-samples

Table 11 presents the number of patients with and without bio-samples. The consent status for patients with at least one bio-sample is at the time point of the first drawn bio-sample. Consent status at enrolment is taken for patients without any bio-samples.

Table 11: Number of patients with bio-samples

	Total	Sample (%)	No sample (%)
Total	6358	5667 89.1	691 10.9
Consent given	5676	5629 99.2	47 0.8
Consent refused	301	0 0.0	301 100.0
Consent withdrawn	1	1 100.0	0 0.0
Consent unknown	171	28 16.4	143 83.6
Death with consent unknown	9	0 0.0	9 100.0
Consent perm unknown	153	9 5.9	144 94.1
Missing	47	0 0.0	47 100.0

Figure 15: Number of bio-samples in STCS

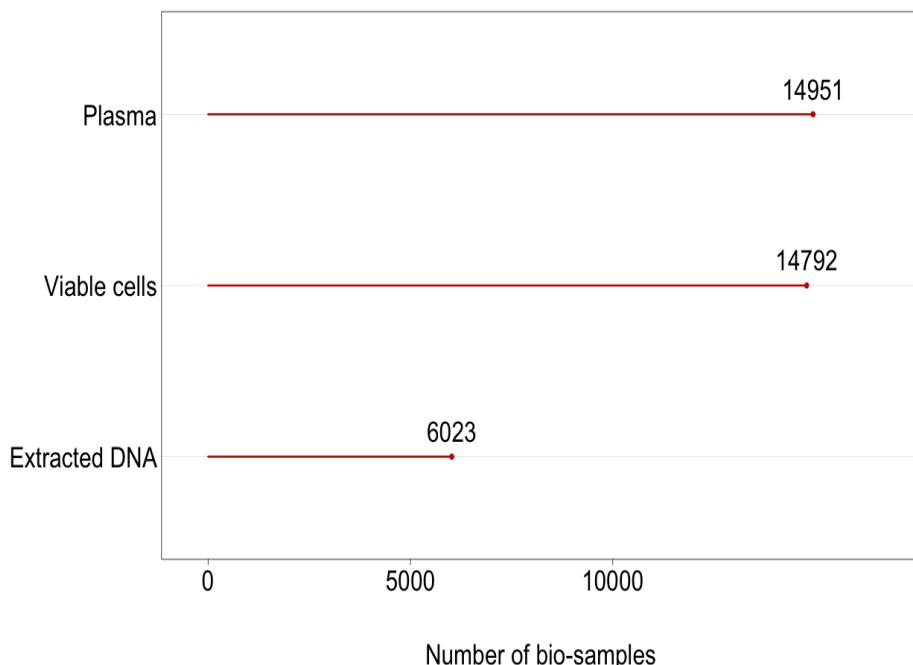


Figure 16: Distribution of number of aliquots by sample type

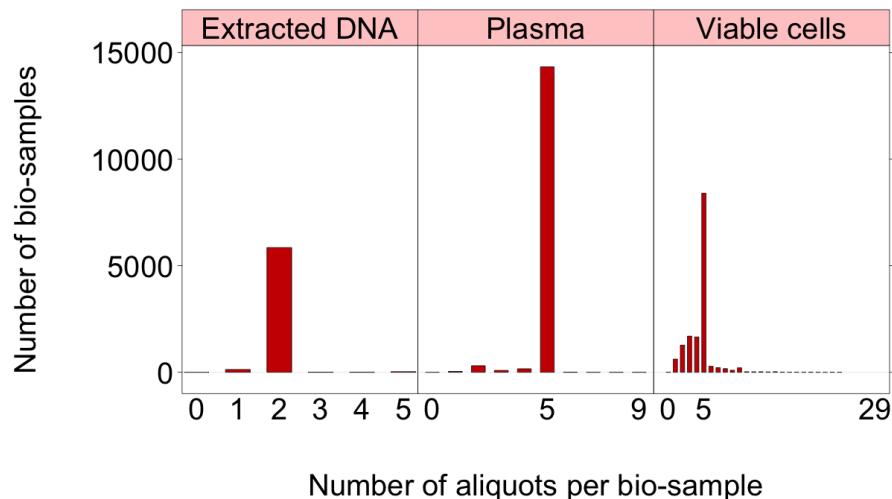
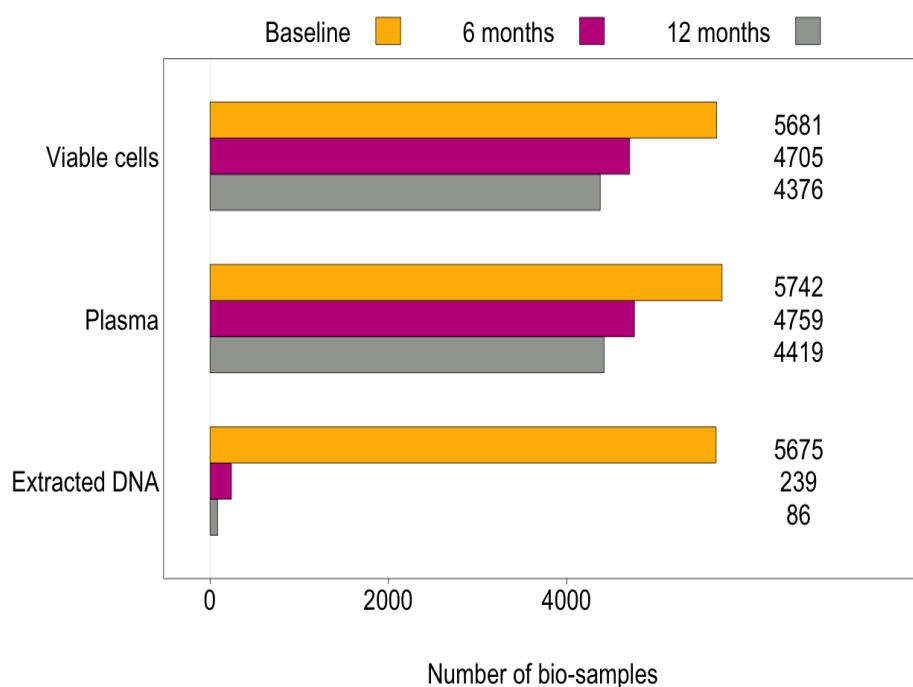


Figure 17: Number of samples by follow-up period



6 Infectious disease events

In Tables 12 and 13, descriptive information about patients with infectious disease (ID) events and types of ID events are given. Figure 18 gives ID event rates by transplantation and pathogen type.

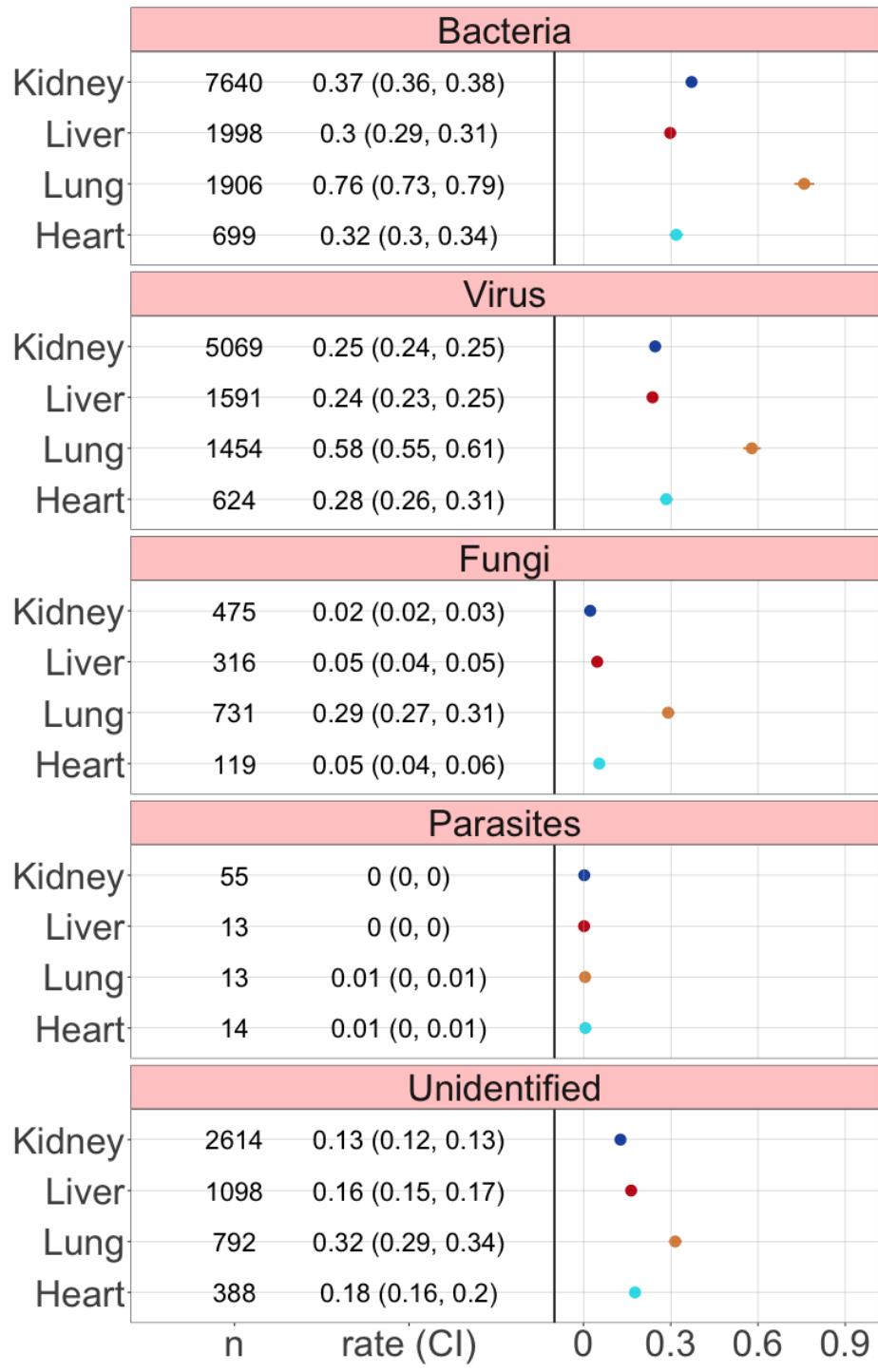
Table 12: Patients with infectious disease events

	N	% (sd)
Total number of patients	6311	
Patients with at least one ID event	4325	68.5%
- Number of ID events, mean (sd)	6.8	(7)
Patients with at least one proven/viral ID event	3286	52.1%
- Number of proven/viral ID events, mean (sd)	3.4	(3.4)

Table 13: Summary of infectious disease events

	N	(%)
Total number of ID events	29534	100.0
Proven disease	10900	36.9
Viral syndrome	178	0.6
Primary infection	44	0.1
Probable disease	6803	23.0
Asymptomatic	4692	15.9
Colonization	6029	20.4
Possible disease	84	0.3
Fever neutropenia	42	0.1
Information missing	762	2.6

Figure 18: Rate of infectious disease events by pathogen and Tpx type



Remark: The rate of ID events is defined as the number of ID events per year of observation time. It is calculated as the number of ID events divided by the total person-years of follow up according to transplantation program. Some backlog in the reporting of ID events cannot be excluded.

7 Follow-up

Percentages in Figures 19 and 20 have to be read as proportions of transplantation for which at least the 6 month or the 12 month FUP visit was performed.

Figure 19: Number of Tpx with 6 month FUP

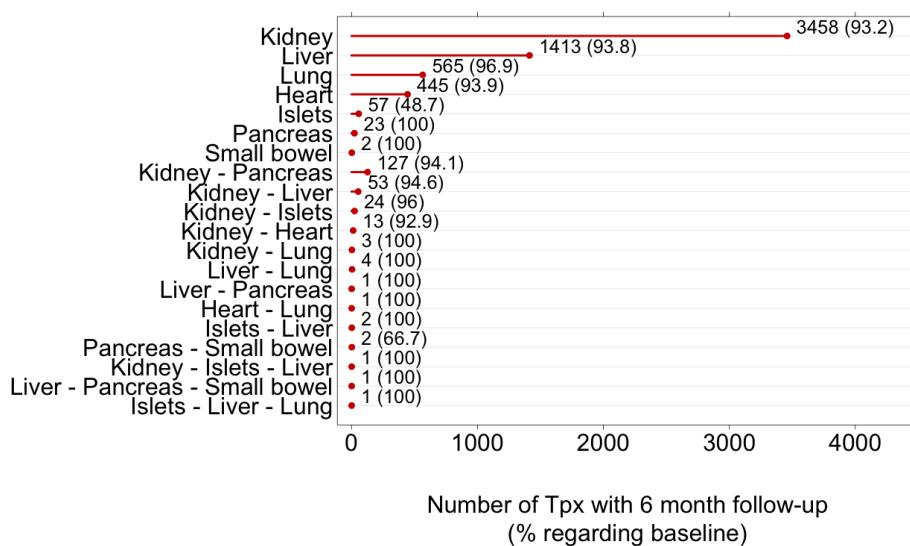
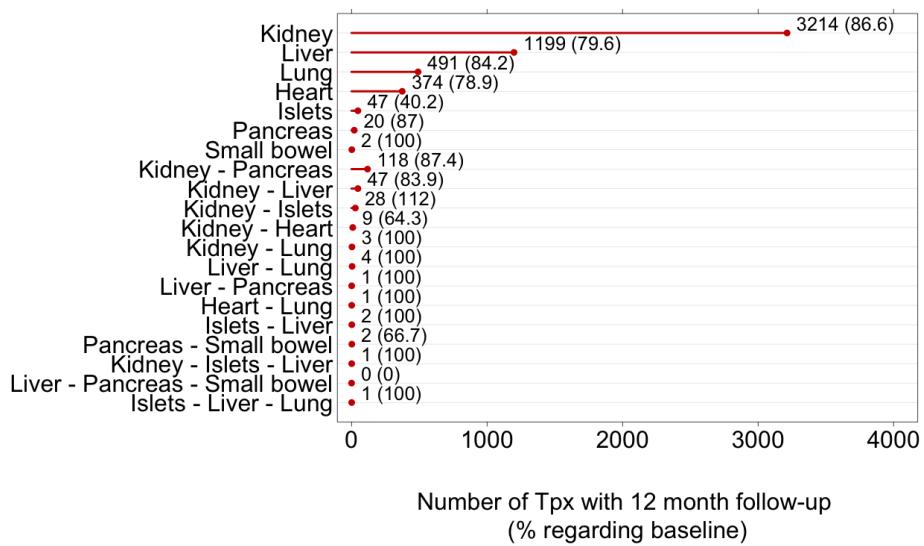


Figure 20: Number of Tpx with 12 month FUP



8 Mortality

In the following, survival probability estimates can only be descriptively interpreted since the precision is low due to the small number of patients at risk at the end of FUP. In Figure 21, the 95%-confidence interval (CI) is given. Furthermore, survival probability estimates are not adjusted for potential risk factors (in Figures and Tables).

8.1 Overall

Table 14: Follow-up information of patients

	Follow-up
Median follow-up duration (years)	4.75
IQR (years)	2.18 - 8.35
Maximum follow-up (years)*	12.99
Number of deaths	1078
Patients with (at least one) graft failure	695
Patients lost to follow-up**	100

* Time period from 1 May 2008 to 31 December 2020

** More details in Table 15.

Table 15: Number of patients who dropped out by Tpx type

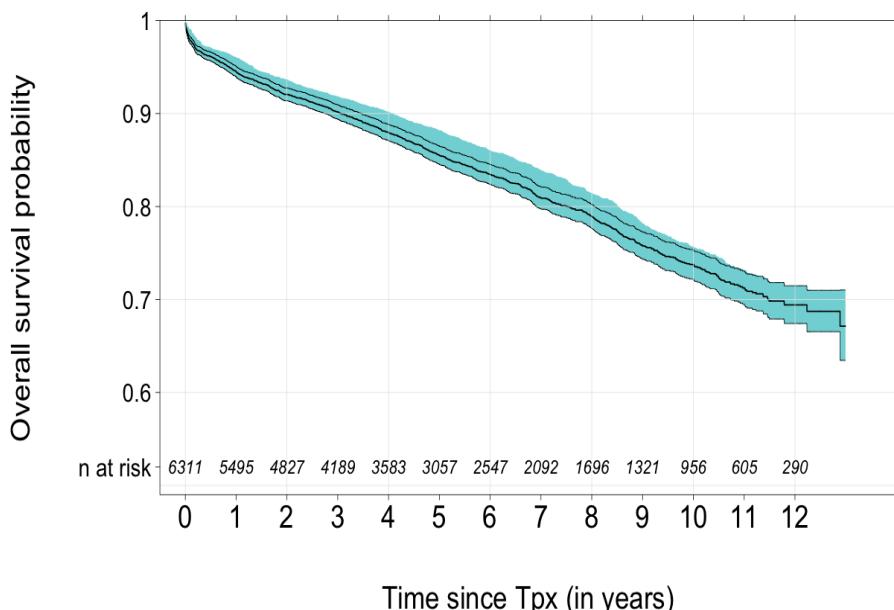
	BE	CHUV	HUG	SG	USB	USZ	Sum
Enrolled, N	998	1019	964	242	893	2195	6311
Dropped out, N (%)	12 (1.2%)	20 (2%)	22 (2.3%)	0 (0%)	5 (0.6%)	41 (1.9%)	100 (1.6%)
- Heart	2	1	-	-	-	4	7
- Islets	-	-	-	-	-	2	2
- Kidney	9	14	10	-	5	18	56
- Kidney - Liver	1	-	-	-	-	-	1
- Kidney - Pancreas	-	-	1	-	-	3	4
- Liver	-	-	11	-	-	14	25
- Lung	-	5	-	-	-	-	5

Table 16: Overall mortality

Time	Mortality (%)	95% CI	No at risk	Cum. deaths
Baseline	0.0	-	6311	0
1 month	2.0	(1.7, 2.3)	6141	126
6 months	3.9	(3.4, 4.3)	5817	242
1 year	5.5	(4.9, 6.1)	5495	338
2 year(s)	7.9	(7.3, 8.6)	4827	474
4 year(s)	12.1	(11.2, 12.9)	3583	665
6 year(s)	16.6	(15.5, 17.6)	2547	825
8 year(s)	21.1	(19.8, 22.3)	1696	943
10 year(s)	26.2	(24.6, 27.8)	956	1035
12 year(s)	30.6	(28.5, 32.6)	290	1075
Overall	32.9	(29, 36.5)	-	1078

Remarks: 'Cum.' stands for 'Cumulative'. The 95%-CI is given for 'Mortality'. The time point 'Overall' refers to the maximal follow-up time in the STCS (from January 2008 to 31 December 2020).

Figure 21: Overall survival



8.2 Mortality by transplantation

In the following section only frequent transplantation types are presented. In Appendix A a short summary of rare transplantation types are presented in two tables.

Figure 22: Overall survival for frequent Tpx types

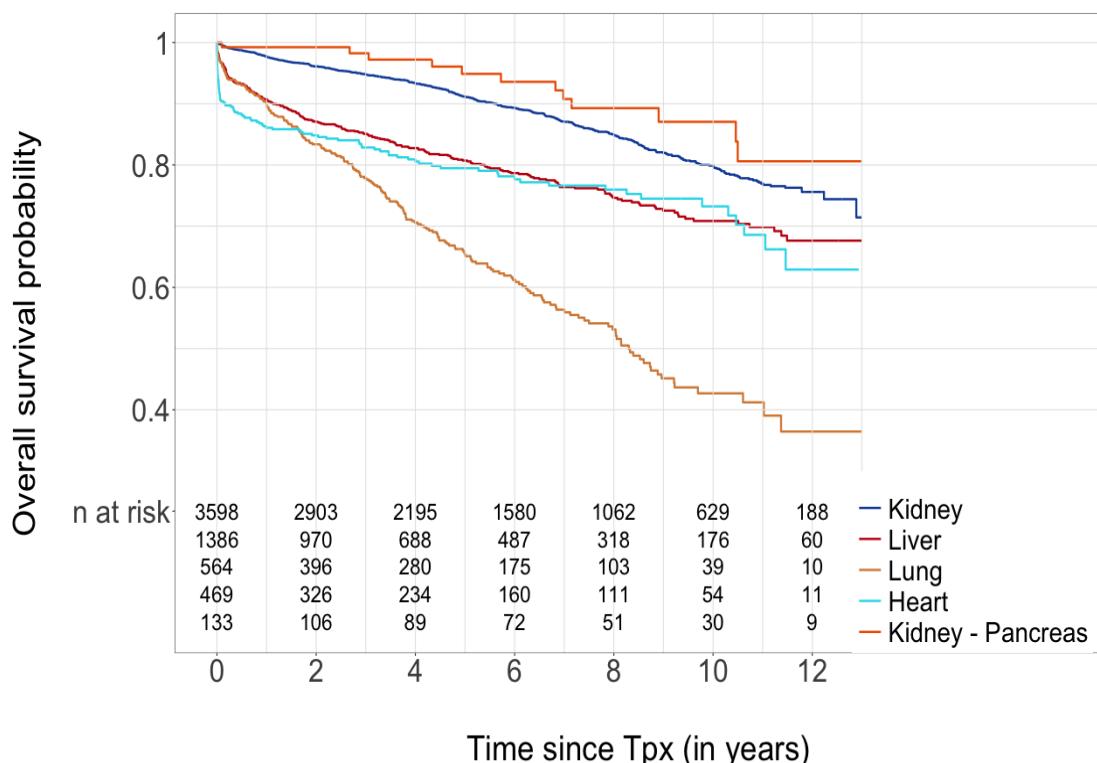


Table 17: Overall mortality by Tpx type

Tpx	Time	Mortality (%)	95% CI	No at risk	Cum. deaths
Kidney	Baseline	0.0	-	3598	0
	1 month	0.3	(0.1, 0.5)	3567	12
	6 months	1.3	(0.9, 1.6)	3416	45
	1 year	2.3	(1.8, 2.8)	3259	80
	2 year(s)	3.9	(3.2, 4.6)	2903	131
	4 year(s)	6.7	(5.8, 7.6)	2195	205
	6 year(s)	10.7	(9.5, 11.9)	1580	288
	8 year(s)	15.1	(13.5, 16.6)	1062	354
	10 year(s)	20.1	(18.1, 22.1)	629	407
	12 year(s)	24.4	(21.8, 26.9)	188	432
	Overall	28.6	(21.9, 34.7)	-	435
Liver	Baseline	0.0	-	1386	0
	1 month	3.3	(2.4, 4.3)	1328	46
	6 months	6.8	(5.4, 8.1)	1230	93
	1 year	9.2	(7.7, 10.8)	1149	125
	2 year(s)	12.9	(11.1, 14.7)	970	169
	4 year(s)	17.2	(15.1, 19.4)	688	211
	6 year(s)	21.3	(18.8, 23.8)	487	241
	8 year(s)	25.4	(22.4, 28.2)	318	262
	10 year(s)	29.1	(25.6, 32.5)	176	275
	12 year(s)	32.4	(27.9, 36.6)	60	280
	Overall	32.4	(27.9, 36.6)	-	280
Lung	Baseline	0.0	-	564	0
	1 month	3.2	(1.7, 4.6)	541	18
	6 months	7.0	(4.8, 9.1)	508	39
	1 year	10.2	(7.6, 12.7)	465	56
	2 year(s)	16.6	(13.4, 19.8)	396	88
	4 year(s)	29.4	(25.2, 33.4)	280	143
	6 year(s)	38.8	(33.9, 43.3)	175	175
	8 year(s)	46.9	(41.3, 51.9)	103	195
	10 year(s)	57.3	(50.6, 63.1)	39	212
	12 year(s)	63.5	(53.9, 71.2)	10	215
	Overall	63.5	(53.9, 71.2)	-	215
Heart	Baseline	0.0	-	469	0
	1 month	9.4	(6.7, 12)	420	44
	6 months	11.8	(8.8, 14.7)	391	55
	1 year	13.9	(10.7, 17)	364	64
	2 year(s)	15.2	(11.8, 18.4)	326	69
	4 year(s)	19.4	(15.5, 23.2)	234	83
	6 year(s)	22.3	(18, 26.5)	160	90
	8 year(s)	24.0	(19.3, 28.5)	111	93
	10 year(s)	26.8	(21.1, 32)	54	96
	12 year(s)	37.1	(26.1, 46.4)	11	101
	Overall	37.1	(26.1, 46.4)	-	101
Kidney - Pancreas	Baseline	0.0	-	133	0
	1 month	0.0	-	131	0
	6 months	0.8	(0, 2.2)	125	1
	1 year	0.8	(0, 2.2)	119	1
	2 year(s)	0.8	(0, 2.2)	106	1
	4 year(s)	2.8	(0, 5.9)	89	3
	6 year(s)	6.4	(1.2, 11.3)	72	6
	8 year(s)	10.7	(3.7, 17.2)	51	9
	10 year(s)	12.9	(4.7, 20.5)	30	10

Tpx	Time	Mortality (%)	95% CI	No at risk	Cum. deaths
-	12 year(s)	19.4	(7.3, 29.9)	9	12
-	Overall	19.4	(7.3, 29.9)	-	12

8.3 Mortality by Tpx and centre

Figure 23: Overall survival for frequent Tpx

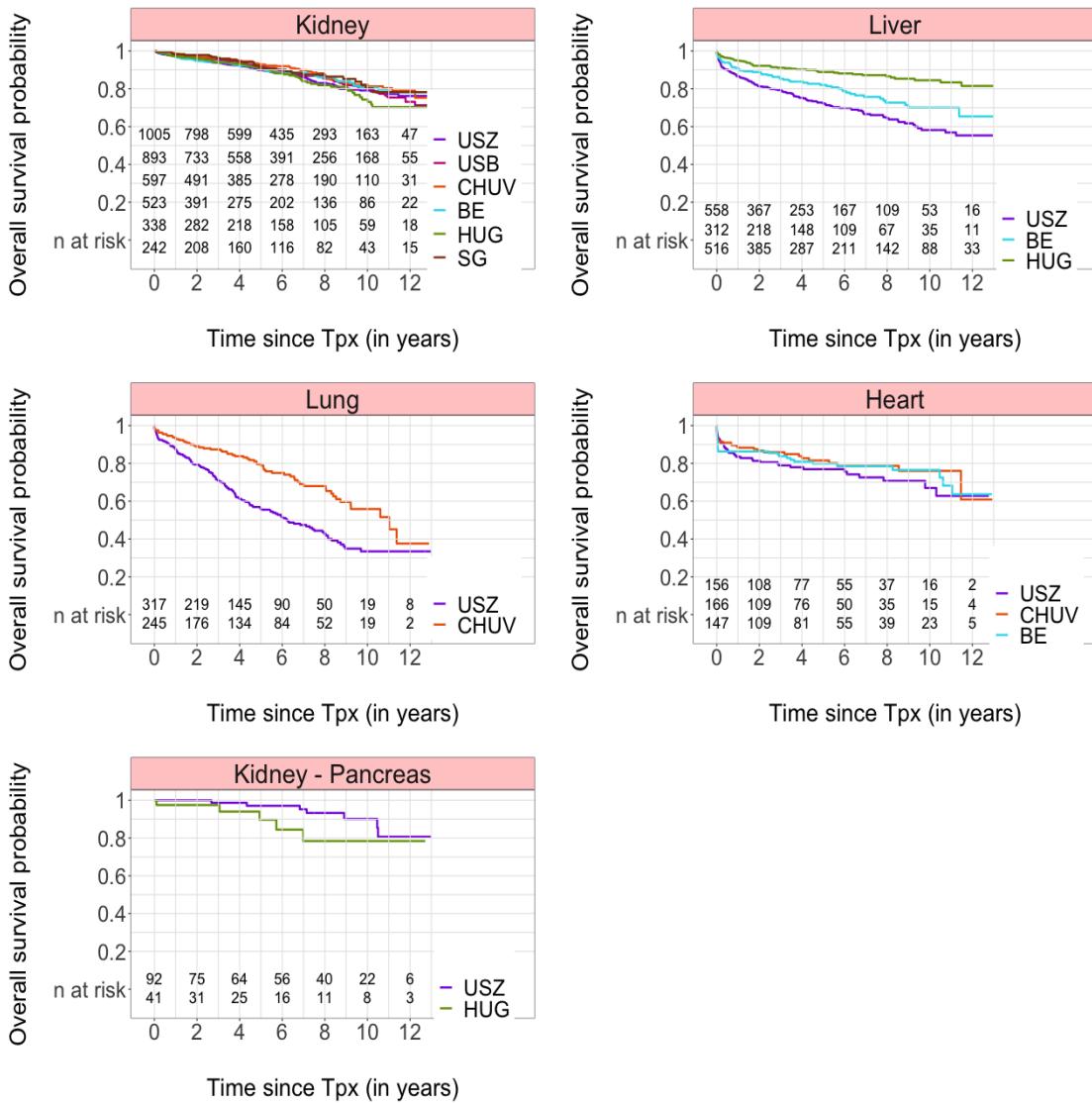


Table 18: Overall mortality by frequent Tpx type and centre

Tpx - centre	Time	Mortality (%)	95% CI	No at risk	Cum. deaths
Kidney - USZ	Baseline	0.0	-	1005	0
	1 month	0.3	(0, 0.6)	994	3
	6 months	1.8	(1, 2.6)	935	18
	1 year	2.8	(1.7, 3.8)	892	27
	2 year(s)	4.6	(3.3, 5.9)	798	43
	4 year(s)	7.8	(6, 9.6)	599	67
	6 year(s)	11.8	(9.4, 14.1)	435	90
	8 year(s)	17.0	(13.9, 20)	293	112
	10 year(s)	20.9	(17.2, 24.4)	163	124
	12 year(s)	23.8	(19.1, 28.3)	47	128
	Overall	33.3	(12.8, 49)	-	129
Kidney - USB	Baseline	0.0	-	893	0
	1 month	0.3	(0, 0.7)	887	3
	6 months	1.2	(0.5, 2)	852	11
	1 year	2.0	(1, 2.9)	815	17
	2 year(s)	3.3	(2.1, 4.6)	733	28
	4 year(s)	6.0	(4.3, 7.7)	558	46
	6 year(s)	10.4	(8, 12.8)	391	69
	8 year(s)	14.4	(11.3, 17.4)	256	84
	10 year(s)	18.9	(15, 22.7)	168	96
	12 year(s)	26.9	(21, 32.4)	55	108
	Overall	28.7	(21.8, 35)	-	109
Kidney - CHUV	Baseline	0.0	-	597	0
	1 month	0.3	(0, 0.8)	588	2
	6 months	0.7	(0, 1.3)	573	4
	1 year	1.4	(0.4, 2.3)	554	8
	2 year(s)	3.0	(1.6, 4.4)	491	17
	4 year(s)	5.3	(3.3, 7.2)	385	27
	6 year(s)	8.1	(5.5, 10.6)	278	37
	8 year(s)	12.8	(9.1, 16.3)	190	49
	10 year(s)	17.9	(13.2, 22.4)	110	59
	12 year(s)	21.0	(15.2, 26.4)	31	62
	Overall	24.7	(15.2, 33.2)	-	63
Kidney - BE	Baseline	0.0	-	523	0
	1 month	0.4	(0, 0.9)	520	2
	6 months	1.4	(0.4, 2.4)	489	7
	1 year	3.0	(1.5, 4.5)	454	15
	2 year(s)	5.3	(3.2, 7.3)	391	25
	4 year(s)	7.7	(5.1, 10.3)	275	33
	6 year(s)	11.6	(8.1, 15)	202	43
	8 year(s)	13.9	(9.8, 17.9)	136	47
	10 year(s)	19.4	(13.7, 24.6)	86	54
	12 year(s)	21.9	(15.3, 27.9)	22	56
	Overall	21.9	(15.3, 27.9)	-	56
Kidney - HUG	Baseline	0.0	-	338	0
	1 month	0.3	(0, 0.9)	337	1
	6 months	1.2	(0, 2.3)	330	4
	1 year	2.7	(0.9, 4.4)	316	9
	2 year(s)	4.0	(1.8, 6.1)	282	13
	4 year(s)	7.0	(4, 9.8)	218	21
	6 year(s)	11.8	(7.7, 15.7)	158	31
	8 year(s)	18.1	(12.6, 23.3)	105	41
	10 year(s)	25.7	(18.1, 32.6)	59	48

Tpx - centre	Time	Mortality (%)	95% CI	No at risk	Cum. deaths
-	12 year(s)	29.6	(21, 37.3)	18	51
-	Overall	29.6	(21, 37.3)	-	51
Kidney - SG	Baseline	0.0	-	242	0
-	1 month	0.4	(0, 1.2)	241	1
-	6 months	0.4	(0, 1.2)	237	1
-	1 year	1.7	(0, 3.3)	228	4
-	2 year(s)	2.1	(0.3, 4)	208	5
-	4 year(s)	5.3	(2.2, 8.3)	160	11
-	6 year(s)	9.9	(5.4, 14.3)	116	18
-	8 year(s)	12.5	(7.1, 17.5)	82	21
-	10 year(s)	19.8	(11.5, 27.3)	43	26
-	12 year(s)	21.8	(12.7, 29.9)	15	27
-	Overall	21.8	(12.7, 29.9)	-	27
Liver - USZ	Baseline	0.0	-	558	0
-	1 month	4.7	(2.9, 6.4)	527	26
-	6 months	10.0	(7.4, 12.4)	481	55
-	1 year	13.4	(10.5, 16.2)	446	73
-	2 year(s)	18.6	(15.2, 21.9)	367	98
-	4 year(s)	24.8	(20.8, 28.6)	253	122
-	6 year(s)	30.1	(25.6, 34.5)	167	138
-	8 year(s)	35.6	(30.3, 40.6)	109	149
-	10 year(s)	41.8	(35.2, 47.7)	53	157
-	12 year(s)	44.7	(37.1, 51.3)	16	159
-	Overall	44.7	(37.1, 51.3)	-	159
Liver - BE	Baseline	0.0	-	312	0
-	1 month	3.5	(1.5, 5.6)	298	11
-	6 months	6.1	(3.4, 8.8)	276	19
-	1 year	8.9	(5.7, 12.1)	253	27
-	2 year(s)	11.1	(7.5, 14.7)	218	33
-	4 year(s)	16.2	(11.6, 20.6)	148	44
-	6 year(s)	21.3	(15.7, 26.5)	109	52
-	8 year(s)	27.3	(20.4, 33.7)	67	59
-	10 year(s)	29.9	(22.2, 36.9)	35	61
-	12 year(s)	34.6	(22.4, 44.9)	11	62
-	Overall	34.6	(22.4, 44.9)	-	62
Liver - HUG	Baseline	0.0	-	516	0
-	1 month	1.8	(0.6, 2.9)	503	9
-	6 months	3.7	(2.1, 5.3)	473	19
-	1 year	5.0	(3, 6.8)	450	25
-	2 year(s)	7.8	(5.4, 10.2)	385	38
-	4 year(s)	9.8	(7, 12.5)	287	45
-	6 year(s)	11.9	(8.7, 15)	211	51
-	8 year(s)	13.4	(9.8, 16.9)	142	54
-	10 year(s)	15.5	(11.2, 19.6)	88	57
-	12 year(s)	18.5	(12.4, 24.2)	33	59
-	Overall	18.5	(12.4, 24.2)	-	59
Lung - USZ	Baseline	0.0	-	317	0
-	1 month	3.5	(1.4, 5.5)	305	11
-	6 months	8.6	(5.4, 11.6)	282	27
-	1 year	12.6	(8.8, 16.2)	257	39
-	2 year(s)	20.6	(15.9, 25.1)	219	62
-	4 year(s)	38.7	(32.6, 44.2)	145	108
-	6 year(s)	48.4	(41.7, 54.3)	90	128
-	8 year(s)	57.3	(49.8, 63.6)	50	141

Tpx - centre	Time	Mortality (%)	95% CI	No at risk	Cum. deaths
-	10 year(s)	66.6	(57.9, 73.4)	19	150
-	12 year(s)	66.6	(57.9, 73.4)	8	150
-	Overall	66.6	(57.9, 73.4)	-	150
Lung - CHUV	Baseline	0.0	-	245	0
	1 month	2.5	(0.5, 4.4)	235	6
	6 months	4.5	(1.9, 7.1)	225	11
	1 year	6.8	(3.5, 9.9)	207	16
	2 year(s)	11.0	(6.8, 15.1)	176	25
	4 year(s)	16.2	(11, 21.1)	134	34
	6 year(s)	25.1	(18.2, 31.3)	84	46
	8 year(s)	32.0	(23.8, 39.3)	52	53
	10 year(s)	44.1	(33.2, 53.3)	19	61
	12 year(s)	62.4	(37.8, 77.3)	2	64
	Overall	62.4	(37.8, 77.3)	-	64
Lung - HUG	Baseline	0.0	-	2	0
	1 month	50.0	(0, 87.5)	1	1
	6 months	50.0	(0, 87.5)	1	1
	1 year	50.0	(0, 87.5)	1	1
	2 year(s)	50.0	(0, 87.5)	1	1
	4 year(s)	50.0	(0, 87.5)	1	1
	6 year(s)	50.0	(0, 87.5)	1	1
	8 year(s)	50.0	(0, 87.5)	1	1
	10 year(s)	50.0	(0, 87.5)	1	1
	12 year(s)	50.0	(0, 87.5)	-	1
	Overall	50.0	(0, 87.5)	-	1
Heart - USZ	Baseline	0.0	-	156	0
	1 month	6.4	(2.5, 10.2)	144	10
	6 months	13.1	(7.5, 18.2)	129	20
	1 year	16.5	(10.4, 22.2)	120	25
	2 year(s)	18.7	(12.2, 24.7)	108	28
	4 year(s)	22.0	(14.9, 28.6)	77	32
	6 year(s)	24.4	(16.7, 31.5)	55	34
	8 year(s)	29.3	(20, 37.5)	37	37
	10 year(s)	33.0	(21.1, 43.1)	16	38
	12 year(s)	37.2	(22.8, 48.9)	2	39
	Overall	37.2	(22.8, 48.9)	-	39
Heart - CHUV	Baseline	0.0	-	166	0
	1 month	8.4	(4.1, 12.6)	152	14
	6 months	9.1	(4.6, 13.3)	143	15
	1 year	11.7	(6.6, 16.5)	131	19
	2 year(s)	13.3	(7.8, 18.4)	109	21
	4 year(s)	17.2	(10.6, 23.4)	76	25
	6 year(s)	21.3	(13.4, 28.5)	50	28
	8 year(s)	21.3	(13.4, 28.5)	35	28
	10 year(s)	24.0	(14.5, 32.3)	15	29
	12 year(s)	39.2	(4.3, 61.3)	4	30
	Overall	39.2	(4.3, 61.3)	-	30
Heart - BE	Baseline	0.0	-	147	0
	1 month	13.7	(7.9, 19.1)	124	20
	6 months	13.7	(7.9, 19.1)	119	20
	1 year	13.7	(7.9, 19.1)	113	20
	2 year(s)	13.7	(7.9, 19.1)	109	20
	4 year(s)	19.0	(12.1, 25.5)	81	26
	6 year(s)	21.5	(13.8, 28.4)	55	28

Tpx - centre	Time	Mortality (%)	95% CI	No at risk	Cum. deaths
-	8 year(s)	21.5	(13.8, 28.4)	39	28
-	10 year(s)	23.5	(14.9, 31.2)	23	29
-	12 year(s)	36.3	(19.5, 49.6)	5	32
-	Overall	36.3	(19.5, 49.6)	-	32
Kidney - Pancreas - USZ	Baseline	0.0	-	92	0
-	1 month	0.0	-	92	0
-	6 months	0.0	-	89	0
-	1 year	0.0	-	84	0
-	2 year(s)	0.0	-	75	0
-	4 year(s)	1.4	(0, 4.1)	64	1
-	6 year(s)	3.0	(0, 7)	56	2
-	8 year(s)	6.8	(0.1, 13)	40	4
-	10 year(s)	9.9	(0.8, 18.1)	22	5
-	12 year(s)	19.4	(3.3, 32.7)	6	7
-	Overall	19.4	(3.3, 32.7)	-	7
Kidney - Pancreas - HUG	Baseline	0.0	-	41	0
-	1 month	0.0	-	39	0
-	6 months	2.6	(0, 7.4)	36	1
-	1 year	2.6	(0, 7.4)	35	1
-	2 year(s)	2.6	(0, 7.4)	31	1
-	4 year(s)	6.0	(0, 13.9)	25	2
-	6 year(s)	15.6	(0, 29)	16	4
-	8 year(s)	21.6	(1.7, 37.5)	11	5
-	10 year(s)	21.6	(1.7, 37.5)	8	5
-	12 year(s)	21.6	(1.7, 37.5)	3	5
-	Overall	21.6	(1.7, 37.5)	-	5

8.4 Mortality in first single Kidney transplantation

Overall survival for patients with Kidney transplantation as first STCS transplantation is presented separated by the donor type. In Figure 25, category 'Living' is separated in 'Living, ABO c' and 'Living, not ABO c'. The letter 'c' stands for 'compatible'.

Figure 24: Overall survival for patients with first STCS Kidney Tpx by donor type

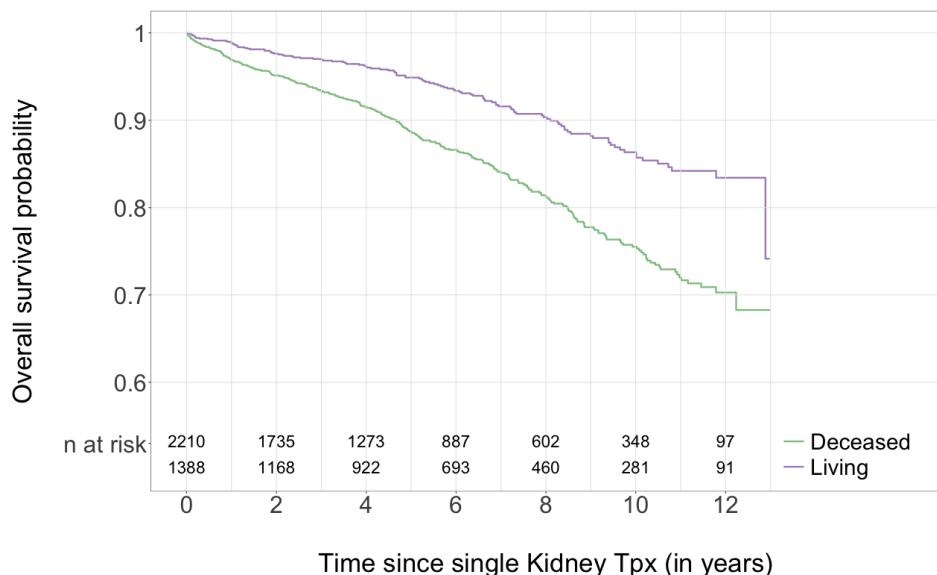


Figure 25: Overall survival for patients with first STCS Kidney Tpx by donor type stratified by ABO compatibility

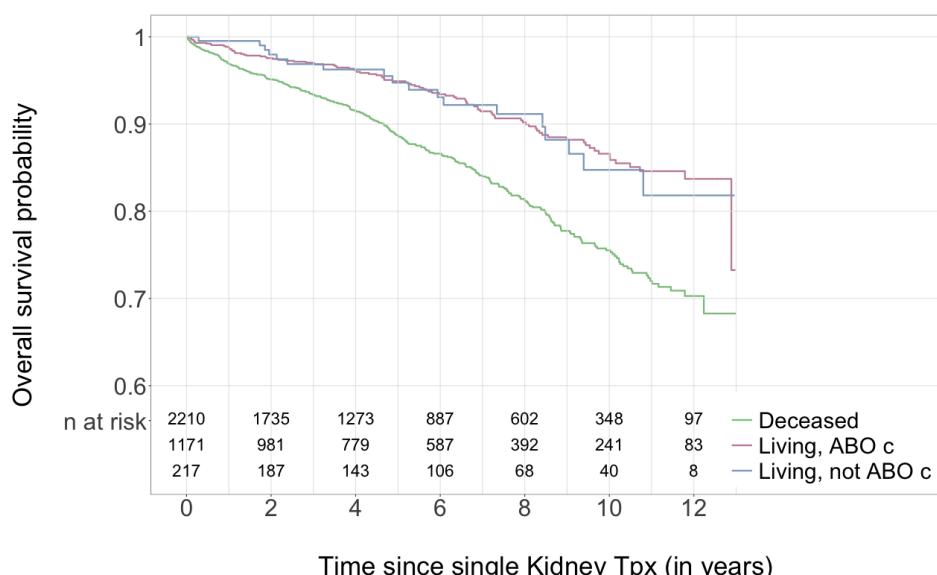


Table 19: Overall mortality in (single) kidney recipients by donor type

Donor type	Time	Mortality (%)	95% CI	No at risk	Cum. deaths
Deceased	Baseline	0.0	-	2210	0
-	1 month	0.5	(0.2, 0.8)	2182	11
-	6 months	1.6	(1.1, 2.1)	2072	35
-	1 year	3.1	(2.3, 3.8)	1969	65
-	2 year(s)	4.9	(3.9, 5.8)	1735	100
-	4 year(s)	8.5	(7.2, 9.8)	1273	158
-	6 year(s)	13.4	(11.7, 15.1)	887	218
-	8 year(s)	18.7	(16.5, 20.9)	602	265
-	10 year(s)	24.5	(21.7, 27.2)	348	301
-	12 year(s)	29.7	(26.1, 33.2)	97	319
-	Overall	31.7	(27.2, 36)	-	321
Living	Baseline	0.0	-	1388	0
-	1 month	0.1	(0, 0.2)	1385	1
-	6 months	0.7	(0.3, 1.2)	1344	10
-	1 year	1.1	(0.5, 1.7)	1290	15
-	2 year(s)	2.4	(1.5, 3.2)	1168	31
-	4 year(s)	3.9	(2.8, 5)	922	47
-	6 year(s)	6.6	(5.1, 8.2)	693	70
-	8 year(s)	9.7	(7.6, 11.6)	460	89
-	10 year(s)	13.7	(10.9, 16.3)	281	106
-	12 year(s)	16.6	(13.1, 20)	91	113
-	Overall	25.9	(6.2, 41.4)	-	114

9 Graft failure and primary non-function

Failure and primary non-function in an allograft are considered as one, no distinction is therefore made in this section.

9.1 Graft failure

Graft failures (incl. grafts with primary non-function) are counted on organ-level (Tables 21 and 22). Table 20 gives a summary of numbers of graft failures on patient- and organ-level. In addition to, numbers of organs with primary non-function are given separately in Table 23.

Table 20: Summary for graft failures

	N	(%)
Graft failure - total	772	100.0
- in single Tpx	715	92.6
- in double Tpx	55	7.1
- in triple Tpx	2	0.3
Patients with at least one graft failure	706	
Patients with graft failure or death	1420	100.0
- graft failure and alive at end of follow-up	342	24.1
- graft failure followed by late death	200	14.1
- graft failure related death (at same day)	153	10.8
- death without any graft failure	725	51.1

Table 21: Graft failures in double Tpx

	Total	Kidney	Heart	Liver	Lung	Pancreas	Islets	Small bowel
Total	55	16	2	5	2	22	6	2
Heart - Lung	2	-	1	-	1	-	-	-
Kidney - Heart	1	-	1	-	-	-	-	-
Kidney - Islets	9	3	-	-	-	-	6	-
Kidney - Liver	9	4	-	5	-	-	-	-
Kidney - Lung	1	1	-	-	-	-	-	-
Kidney - Pancreas	28	8	-	-	-	20	-	-
Liver - Lung	1	-	-	-	1	-	-	-
Pancreas - Small bowel	4	-	-	-	-	2	-	2

Remark: Only double tpx with at least one graft failure are listed.

Table 22: Graft failure and related patients' death

	Total	All GF*	(%)	GF, late death	(%)	GF related death	(%)
Total	6913	772	11.2	232	30.1	170	22
Kidney	3945	365	9.3	105	28.8	9	2.5
Liver	1572	192	12.2	68	35.4	52	27.1
Lung	592	110	18.6	27	24.5	79	71.8
Heart	489	46	9.4	13	28.3	30	65.2
Pancreas	163	28	17.2	8	28.6	-	-
Islets	146	27	18.5	7	25.9	-	-
Small bowel	6	4	66.7	4	100	-	-

* GF: graft failure (incl. primary non-function)

Table 23: Number of organs with primary non-function

	Total	USZ	USB	CHUV	BE	HUG	SG
Total	98	43	5	7	26	16	1
Kidney	32	14	5	3	1	8	1
Liver	47	20	-	-	19	8	-
Lung	3	3	-	-	-	-	-
Heart	12	3	-	3	6	-	-
Pancreas	2	1	-	1	-	-	-
Islets	2	2	-	-	-	-	-
Small bowel	-	-	-	-	-	-	-

9.2 Graft failure free survival

In the following, estimates of graft failure free survival are not adjusted for potential risk factors. Only the first STCS transplantation of each patient is considered. Figure 28 shows graft failure free survival only for patients with first STCS Kidney transplantation.

Figure 26: Graft failure free survival by major Tpx

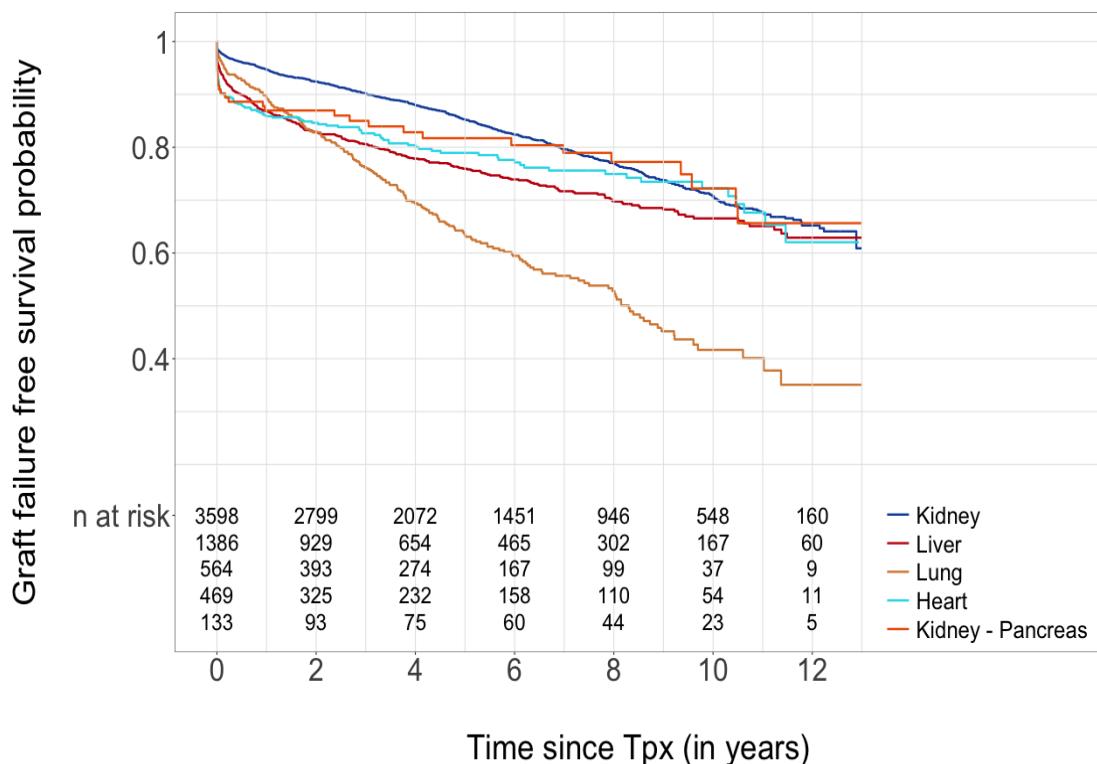


Figure 27: Graft failure free survival by major Tpx and centre

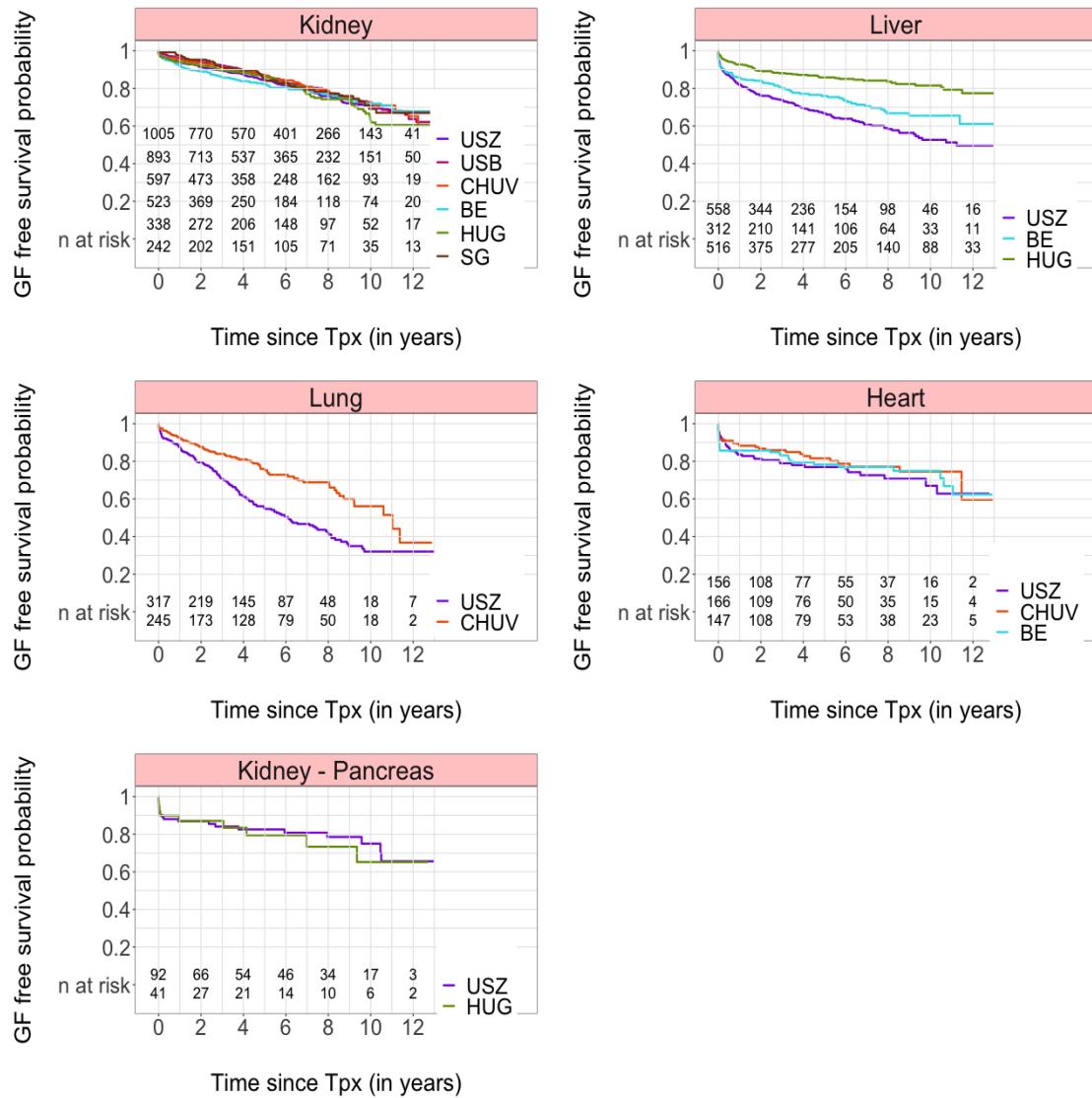
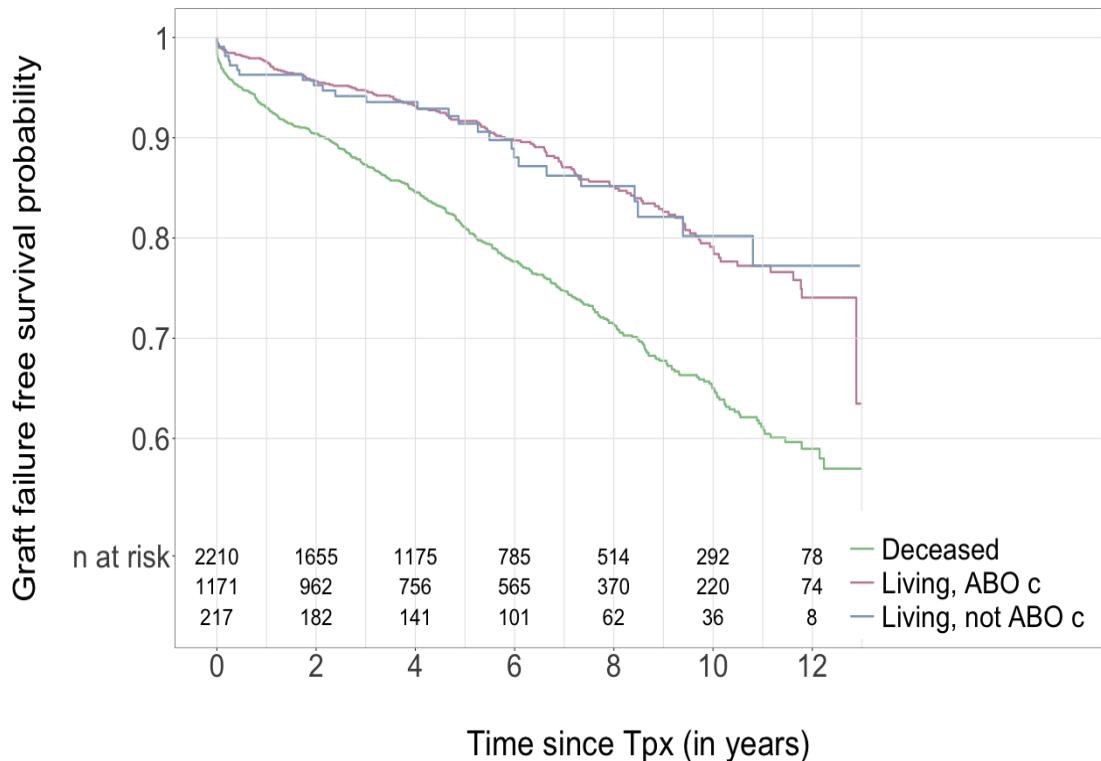


Figure 28: Graft failure free survival in patients with first STCS single Kidney Tpx by donor type (stratified by ABO compatibility)



9.3 Cumulative incidence of graft failure

The cumulative incidence (CumInc) of a graft failure is the probability for a graft failure within the reported time period. CumInc functions for graft failure are not adjusted for potential risk factors (illustrated in Figures and Tables). In Figure 29, Table 24 and Table 25 double kidneys are counted as one kidney.

Figure 29: Cumulative incidence of graft failure

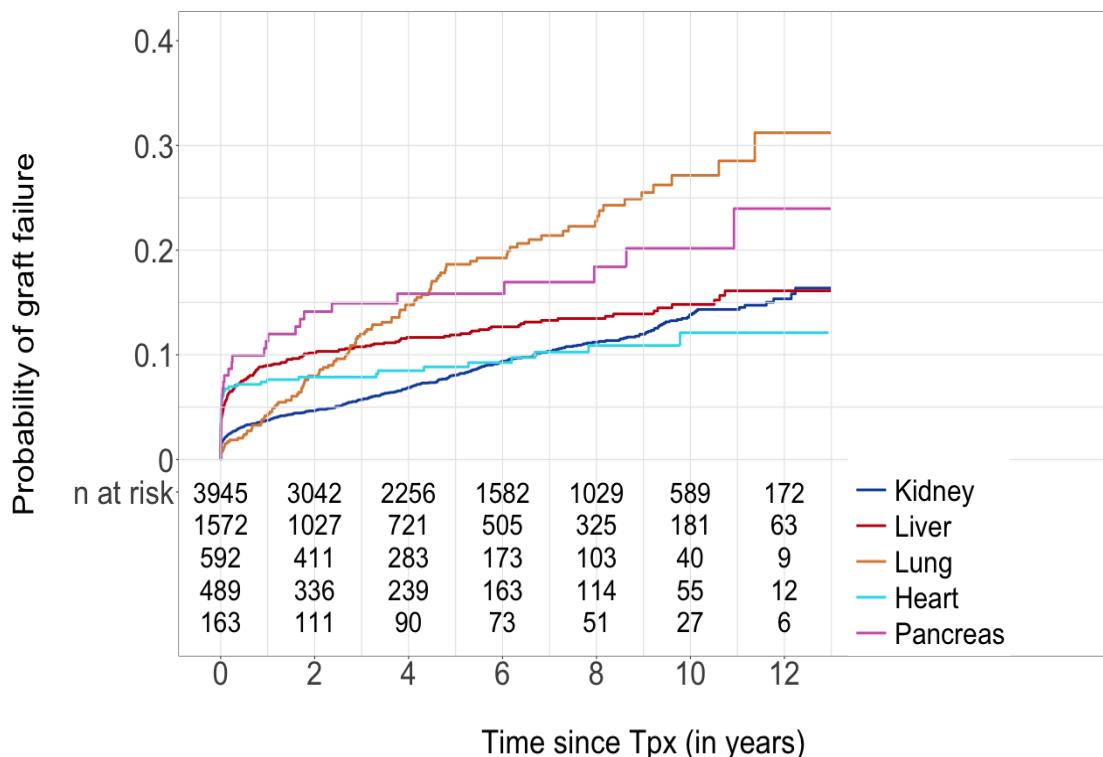


Figure 30: Cumulative incidence of graft failure for single Kidney Tpx by donor type

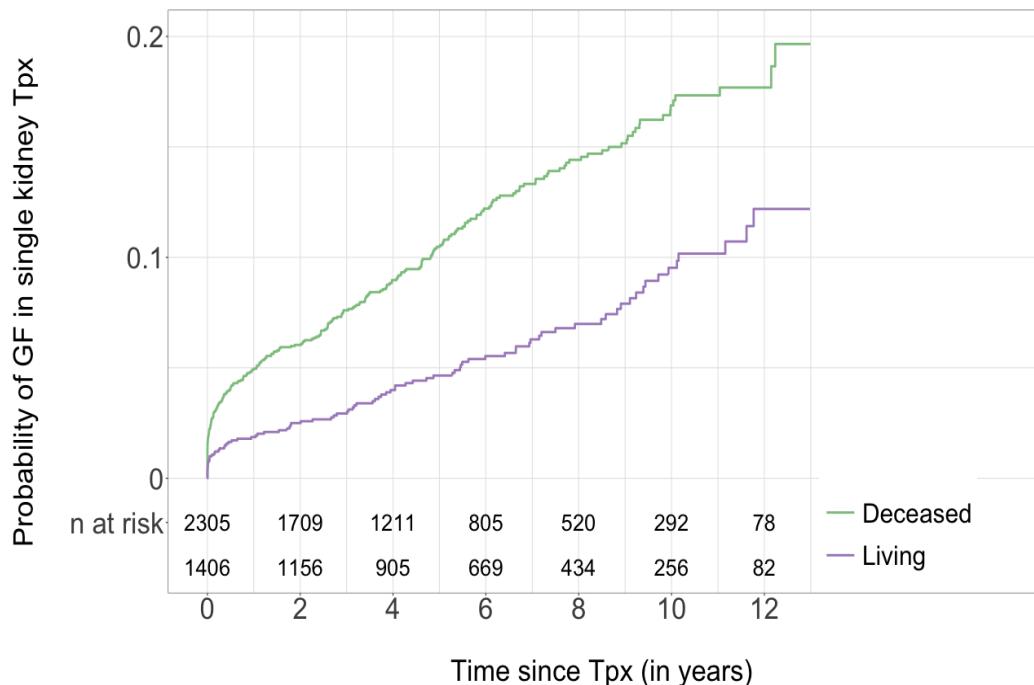


Figure 31: Cumulative incidence of graft failure for kidneys in single Tpx stratified by ABO compatibility

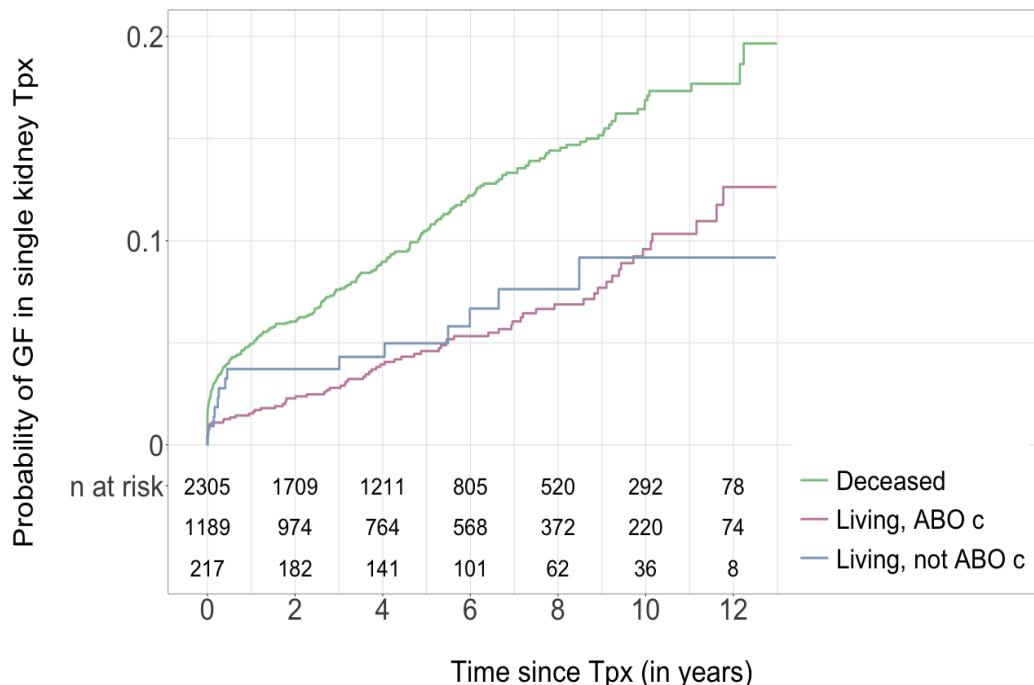


Table 24: Graft failure by organ

Organ	Time	CumInc (%)	95% CI	No at risk	Cum. GF	Cum. deaths
Kidney	Baseline	-	-	3945	0	0
-	1 month	2.1	(1.6,2.5)	3827	81	10
-	6 months	3.2	(2.7,3.8)	3627	124	36
-	1 year	3.8	(3.2,4.4)	3437	146	69
-	2 year(s)	4.6	(4.5,5.3)	3042	177	114
-	4 year(s)	6.9	(6.1,7.7)	2256	242	176
-	6 year(s)	9.4	(8.4,10.5)	1582	298	246
-	8 year(s)	11.2	(10.1,12.5)	1029	328	302
-	10 year(s)	13.8	(12.3,15.4)	589	355	344
-	12 year(s)	15.3	(13.5,17.3)	172	363	368
-	Overall	16.4	(14.1,18.8)	0	365	369
Liver	Baseline	-	-	1572	0	0
-	1 month	5.4	(4.3,6.5)	1448	84	24
-	6 months	7.6	(6.4,9)	1323	119	61
-	1 year	9	(7.6,10.5)	1227	139	84
-	2 year(s)	10.2	(8.7,11.8)	1027	155	121
-	4 year(s)	11.7	(10.1,13.4)	721	171	160
-	6 year(s)	12.7	(11.1,14.5)	505	179	187
-	8 year(s)	13.5	(11.6,15.4)	325	184	207
-	10 year(s)	14.8	(12.7,17.1)	181	189	215
-	12 year(s)	16.1	(13.6,18.8)	63	192	218
-	Overall	16.1	(13.6,18.8)	0	192	218
Lung	Baseline	-	-	592	0	0
-	1 month	1.4	(0.6,2.6)	565	8	14
-	6 months	2.4	(1.4,3.9)	529	14	32
-	1 year	4.4	(2.9,6.3)	483	25	41
-	2 year(s)	8	(5.9,10.5)	411	44	57
-	4 year(s)	14.8	(11.8,18)	283	75	89
-	6 year(s)	19.3	(15.8,23)	173	92	107
-	8 year(s)	22.8	(18.8,27)	103	101	115
-	10 year(s)	27.1	(22.2,32.3)	40	108	125
-	12 year(s)	31.2	(23.9,38.8)	9	110	126
-	Overall	31.2	(23.9,38.8)	0	110	126
Heart	Baseline	-	-	489	0	0
-	1 month	6.6	(4.6,9)	436	32	16
-	6 months	7.2	(5.1,9.7)	404	35	25
-	1 year	7.6	(5.5,10.2)	374	37	33
-	2 year(s)	7.9	(5.7,10.5)	336	38	37
-	4 year(s)	8.5	(6.2,11.2)	239	40	50
-	6 year(s)	9.3	(6.8,12.2)	163	42	55
-	8 year(s)	10.9	(7.9,14.4)	114	45	56
-	10 year(s)	12.1	(8.5,16.5)	55	46	58
-	12 year(s)	12.1	(8.5,16.5)	12	46	63
-	Overall	12.1	(8.5,16.5)	0	46	63
Pancreas	Baseline	-	-	163	0	0
-	1 month	8	(4.5,12.9)	146	13	1

Organ	Time	CumInc (%)	95% CI	No at risk	Cum. GF	Cum. deaths
-	6 months	9.9	(5.9,15.2)	137	16	1
-	1 year	11.3	(7,16.8)	129	18	1
-	2 year(s)	14.1	(9.2,20.1)	111	22	1
-	4 year(s)	15.8	(10.5,22.2)	90	24	3
-	6 year(s)	15.8	(10.5,22.2)	73	24	5
-	8 year(s)	18.4	(12.2,25.6)	51	26	6
-	10 year(s)	20.2	(13.3,28)	27	27	8
-	12 year(s)	24	(14.5,34.7)	6	28	10
-	Overall	24	(14.5,34.7)	0	28	10

||

Table 25: Graft failure by organ and centre

Organ - Centre	Time	CumInc (%)	95% CI	No at risk	Cum. GF	Cum. deaths
Kidney-USZ	Baseline	0.0	-	1168	0	0
-	1 month	2.4	(1.6,3.4)	1126	28	2
-	6 months	4.0	(3.5,2)	1054	46	9
-	1 year	4.3	(3.3,5.6)	1006	50	16
-	2 year(s)	5.2	(4,6.6)	897	59	31
-	4 year(s)	6.6	(5.2,8.2)	674	71	52
-	6 year(s)	9.2	(7.4,11.2)	481	88	72
-	8 year(s)	10.5	(8.5,12.8)	319	95	91
-	10 year(s)	12.5	(10,15.2)	171	101	102
-	12 year(s)	13.8	(11,16.9)	48	104	107
-	Overall	13.8	(11,16.9)	0	104	108
Kidney-USB	Baseline	0.0	-	909	0	0
-	1 month	1.0	(0.5,1.8)	894	9	2
-	6 months	1.7	(1,2.7)	851	15	10
-	1 year	2.3	(1.4,3.4)	808	20	17
-	2 year(s)	3.1	(2.1,4.4)	721	27	25
-	4 year(s)	5.5	(4.1,7.3)	539	43	40
-	6 year(s)	8.4	(6.4,10.7)	366	58	59
-	8 year(s)	9.8	(7.6,12.4)	232	63	72
-	10 year(s)	11.5	(8.8,14.5)	151	67	82
-	12 year(s)	12.5	(9.3,16.2)	50	68	94
-	Overall	14.0	(9.8,18.9)	0	69	94
Kidney-CHUV	Baseline	0.0	-	632	0	0
-	1 month	2.5	(1.5,4)	607	16	2
-	6 months	3.0	(1.9,4.6)	588	19	4
-	1 year	3.2	(2,4.8)	564	20	8
-	2 year(s)	3.5	(2.3,5.2)	495	22	16
-	4 year(s)	6.9	(5,9.3)	374	38	21
-	6 year(s)	9.8	(7.3,12.7)	258	48	29
-	8 year(s)	12.3	(9.3,15.8)	167	55	37
-	10 year(s)	14.7	(11.1,18.9)	94	59	45
-	12 year(s)	19.7	(13.1,27.3)	19	62	47
-	Overall	24.3	(14,36.1)	0	63	47
Kidney-BE	Baseline	0.0	-	564	0	0
-	1 month	2.5	(1.4,4)	546	14	3
-	6 months	4.7	(3.1,6.6)	502	26	8
-	1 year	6.2	(4.4,8.4)	456	34	16
-	2 year(s)	7.4	(5.4,9.9)	390	40	26
-	4 year(s)	10.8	(8.2,13.8)	263	53	31
-	6 year(s)	12.6	(9.6,15.9)	192	58	37
-	8 year(s)	15.0	(11.5,19)	123	63	39
-	10 year(s)	17.2	(13.1,21.8)	77	66	42
-	12 year(s)	18.6	(13.8,24)	21	67	44
-	Overall	18.6	(13.8,24)	0	67	44
Kidney-HUG	Baseline	0.0	-	424	0	0
-	1 month	2.8	(1.5,4.8)	408	12	1

Organ - Centre	Time	CumInc (%)	95% CI	No at risk	Cum. GF	Cum. deaths
-	6 months	3.8	(2.3,5.9)	391	16	5
-	1 year	4.0	(2.4,6.2)	374	17	9
-	2 year(s)	4.8	(3,7.2)	334	20	12
-	4 year(s)	5.4	(3.5,7.9)	252	22	23
-	6 year(s)	7.1	(4.7,10.1)	179	26	34
-	8 year(s)	9.2	(6.2,12.8)	116	30	45
-	10 year(s)	16.5	(11.2,22.7)	61	38	51
-	12 year(s)	16.5	(11.2,22.7)	21	38	53
-	Overall	16.5	(11.2,22.7)	0	38	53
Kidney-SG	Baseline	0.0	-	248	0	0
-	1 month	0.8	(0.2,2.7)	246	2	0
-	6 months	0.8	(0.2,2.7)	241	2	0
-	1 year	2.1	(0.8,4.5)	229	5	3
-	2 year(s)	3.8	(1.9,6.8)	205	9	4
-	4 year(s)	6.8	(3.9,10.6)	154	15	9
-	6 year(s)	10.1	(6.3,15)	106	20	15
-	8 year(s)	11.9	(7.6,17.3)	72	22	18
-	10 year(s)	14.5	(9.2,21.1)	35	24	22
-	12 year(s)	14.5	(9.2,21.1)	13	24	23
-	Overall	14.5	(9.2,21.1)	0	24	23
Liver-USZ	Baseline	0.0	-	647	0	0
-	1 month	7.1	(5.3,9.3)	579	46	15
-	6 months	9.7	(7.5,12.1)	519	62	39
-	1 year	12.1	(9.7,14.8)	476	77	49
-	2 year(s)	13.6	(11,16.4)	388	85	72
-	4 year(s)	15.1	(12.4,18.1)	266	92	93
-	6 year(s)	16.7	(13.7,19.9)	172	97	108
-	8 year(s)	17.4	(14.3,20.9)	108	99	119
-	10 year(s)	20.4	(16.3,24.8)	53	103	122
-	12 year(s)	21.6	(17,26.5)	17	104	123
-	Overall	21.6	(17,26.5)	0	104	123
Liver-BE	Baseline	0.0	-	361	0	0
-	1 month	7.2	(4.8,10.2)	327	26	5
-	6 months	9.5	(6.7,12.8)	299	34	11
-	1 year	9.8	(7,13.1)	271	35	20
-	2 year(s)	10.1	(7.2,13.5)	230	36	26
-	4 year(s)	12.8	(9.3,16.7)	152	42	36
-	6 year(s)	12.8	(9.3,16.7)	113	42	44
-	8 year(s)	14.2	(10.4,18.6)	69	44	51
-	10 year(s)	14.2	(10.4,18.6)	36	44	53
-	12 year(s)	14.2	(10.4,18.6)	12	44	54
-	Overall	14.2	(10.4,18.6)	0	44	54
Liver-HUG	Baseline	0.0	-	564	0	0
-	1 month	2.1	(1.2,3.6)	542	12	4
-	6 months	4.1	(2.7,6)	505	23	11
-	1 year	4.9	(3.3,6.9)	480	27	15
-	2 year(s)	6.3	(4.5,8.6)	409	34	23
-	4 year(s)	7.1	(5.1,9.5)	303	37	31

Organ - Centre	Time	CumInc (%)	95% CI	No at risk	Cum. GF	Cum. deaths
-	6 year(s)	8.1	(5.8,10.8)	220	40	35
-	8 year(s)	8.5	(6.1,11.3)	148	41	37
-	10 year(s)	9.1	(6.5,12.1)	92	42	40
-	12 year(s)	11.2	(7.6,15.5)	34	44	41
-	Overall	11.2	(7.6,15.5)	0	44	41
Lung-USZ	Baseline	0.0	-	328	0	0
-	1 month	1.8	(0.8,3.8)	312	6	9
-	6 months	2.4	(1.2,4.6)	288	8	24
-	1 year	4.7	(2.7,7.4)	261	15	31
-	2 year(s)	8.8	(6,12.3)	222	27	43
-	4 year(s)	17.5	(13.3,22.2)	146	50	67
-	6 year(s)	21.9	(17.2,27.1)	87	60	80
-	8 year(s)	26.0	(20.5,31.9)	48	66	86
-	10 year(s)	31.3	(24.5,38.3)	18	71	90
-	12 year(s)	31.3	(24.5,38.3)	7	71	90
-	Overall	31.3	(24.5,38.3)	0	71	90
Lung-CHUV	Baseline	0.0	-	257	0	0
-	1 month	0.8	(0.2,2.6)	247	2	4
-	6 months	2.4	(1.4,9)	235	6	7
-	1 year	4.1	(2.1,7.1)	216	10	9
-	2 year(s)	7.2	(4.3,11)	183	17	13
-	4 year(s)	10.7	(7.1,15.2)	133	24	21
-	6 year(s)	15.4	(10.7,21)	83	31	26
-	8 year(s)	18.2	(12.8,24.5)	53	34	28
-	10 year(s)	21.3	(14.7,28.7)	20	36	34
-	12 year(s)	32.6	(16.6,49.8)	2	38	35
-	Overall	32.6	(16.6,49.8)	0	38	35
Lung-HUG	Baseline	0.0	-	7	0	0
-	1 month	0.0	-	6	0	1
-	6 months	0.0	-	6	0	1
-	1 year	0.0	-	6	0	1
-	2 year(s)	0.0	-	6	0	1
-	4 year(s)	17.1	(0.4,56.5)	4	1	1
-	6 year(s)	17.1	(0.4,56.5)	3	1	1
-	8 year(s)	17.1	(0.4,56.5)	2	1	1
-	10 year(s)	17.1	(0.4,56.5)	2	1	1
-	12 year(s)		-	0	1	1
-	Overall	17.1	(0.4,56.5)	0	1	1
Heart-USZ	Baseline	0.0	-	161	0	0
-	1 month	5.0	(2.3,9.1)	147	8	4
-	6 months	6.9	(3.6,11.5)	132	11	11
-	1 year	7.5	(4.1,12.4)	122	12	16
-	2 year(s)	8.3	(4.6,13.2)	110	13	18
-	4 year(s)	8.3	(4.6,13.2)	78	13	22
-	6 year(s)	8.3	(4.6,13.2)	56	13	24
-	8 year(s)	11.6	(6.3,18.6)	38	15	25
-	10 year(s)	15.1	(7.4,25.3)	17	16	25
-	12 year(s)	15.1	(7.4,25.3)	3	16	26

Organ - Centre	Time	CumInc (%)	95% CI	No at risk	Cum. GF	Cum. deaths
-	Overall	15.1	(7.4,25.3)	0	16	26
Heart-CHUV	Baseline	0.0	-	176	0	0
-	1 month	6.3	(3.3,10.5)	162	11	3
-	6 months	6.3	(3.3,10.5)	151	11	4
-	1 year	6.9	(3.8,11.3)	137	12	7
-	2 year(s)	6.9	(3.8,11.3)	115	12	9
-	4 year(s)	6.9	(3.8,11.3)	79	12	13
-	6 year(s)	9.4	(5.1,15.2)	53	14	14
-	8 year(s)	10.9	(6,17.5)	37	15	14
-	10 year(s)	10.9	(6,17.5)	15	15	15
-	12 year(s)	10.9	(6,17.5)	4	15	16
-	Overall	10.9	(6,17.5)	0	15	16
Heart-BE	Baseline	0.0	-	152	0	0
-	1 month	8.6	(4.8,13.7)	127	13	9
-	6 months	8.6	(4.8,13.7)	121	13	10
-	1 year	8.6	(4.8,13.7)	115	13	10
-	2 year(s)	8.6	(4.8,13.7)	111	13	10
-	4 year(s)	10.3	(6,16)	82	15	15
-	6 year(s)	10.3	(6,16)	54	15	17
-	8 year(s)	10.3	(6,16)	39	15	17
-	10 year(s)	10.3	(6,16)	23	15	18
-	12 year(s)	10.3	(6,16)	5	15	21
-	Overall	10.3	(6,16)	0	15	21
Pancreas-USZ	Baseline	0.0	-	103	0	0
-	1 month	7.8	(3.6,14)	94	8	1
-	6 months	10.7	(5.7,17.6)	88	11	1
-	1 year	11.8	(6.4,18.9)	82	12	1
-	2 year(s)	14.0	(8,21.7)	72	14	1
-	4 year(s)	16.6	(9.9,24.8)	60	16	2
-	6 year(s)	16.6	(9.9,24.8)	52	16	3
-	8 year(s)	20.3	(12.3,29.7)	35	18	3
-	10 year(s)	20.3	(12.3,29.7)	18	18	3
-	12 year(s)	25.9	(13.5,40.1)	3	19	5
-	Overall	25.9	(13.5,40.1)	0	19	5
Pancreas-HUG	Baseline	0.0	-	60	0	0
-	1 month	8.6	(3.1,17.6)	52	5	0
-	6 months	8.6	(3.1,17.6)	49	5	0
-	1 year	10.5	(4.2,20.1)	47	6	0
-	2 year(s)	14.4	(6.6,25)	39	8	0
-	4 year(s)	14.4	(6.6,25)	30	8	1
-	6 year(s)	14.4	(6.6,25)	21	8	2
-	8 year(s)	14.4	(6.6,25)	16	8	3
-	10 year(s)	19.1	(8.4,33.2)	9	9	5
-	12 year(s)	19.1	(8.4,33.2)	3	9	5
-	Overall	19.1	(8.4,33.2)	0	9	5

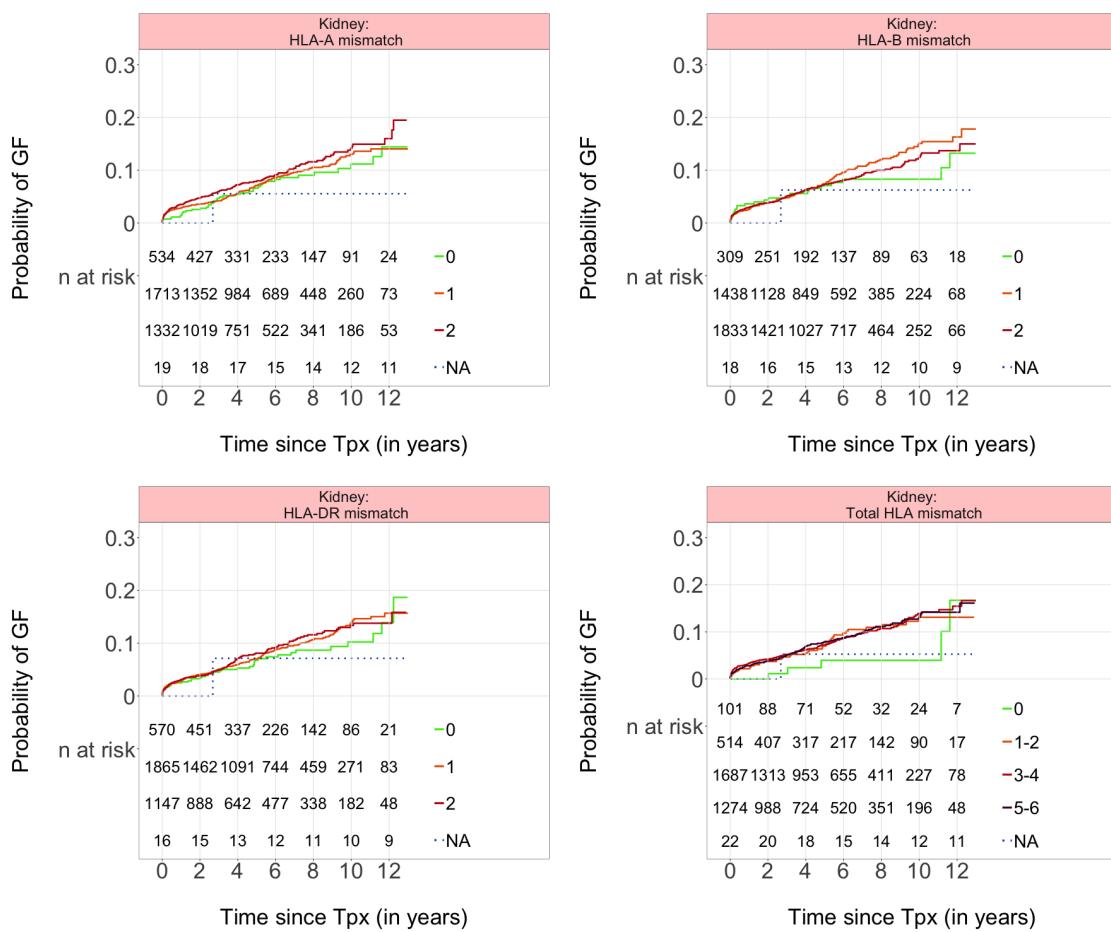
Table 26: Graft failure of kidneys (in first STCS single Tpx) by donor type

Donor type	Time	CumInc (%)	95% CI	No at risk	Cum. GF	Cum. deaths
Deceased	Baseline	-	-	2305	0	0
-	1 month	2.6	(2.3,3)	2219	60	5
-	6 months	4.1	(3.3,4.9)	2077	93	23
-	1 year	5	(4.1,5.9)	1953	112	52
-	2 year(s)	6	(5.1,7.1)	1709	134	81
-	4 year(s)	9	(7.8,10.3)	1211	183	130
-	6 year(s)	12.2	(10.7,13.8)	805	223	178
-	8 year(s)	14.4	(12.7,16.3)	520	243	213
-	10 year(s)	16.9	(14.8,19.1)	292	257	238
-	12 year(s)	17.7	(15.4,20.1)	78	260	255
-	Overall	19.7	(16.2,23.3)	0	262	255
Living	Baseline	-	-	1406	0	0
-	1 month	1	(0.6,1.6)	1389	14	1
-	6 months	1.6	(1.1,2.4)	1341	23	7
-	1 year	1.9	(1.3,2.7)	1285	26	11
-	2 year(s)	2.5	(1.8,3.4)	1156	34	25
-	4 year(s)	4	(3.5,2)	905	50	35
-	6 year(s)	5.5	(4.3,7)	669	63	53
-	8 year(s)	7	(5.5,8.7)	434	72	71
-	10 year(s)	9.5	(7.4,11.9)	256	82	85
-	12 year(s)	12.2	(9.2,15.7)	82	87	90
-	Overall	12.2	(9.2,15.7)	0	87	91

9.4 Graft failure and number of HLA mismatches

Figures 32-35 show the cumulative incidence functions for graft failures separated by (major) transplantation and the number of HLA mismatches¹ between donor and recipient at STCS enrolment. It is distinguished between mismatches for HLA-A, HLA-B and HLA-DR and the total number of HLA mismatches.

Figure 32: Cumulative incidence of graft failure in Kidney Tpx recipients by HLA mismatches



¹The number of mismatches refers to the number of HLA antigens of the donor that are not expressed in the recipient. If the donor is homozygous for a certain HLA locus, only one mismatch was counted. Groups with less than 10 patients at time of tpx are not shown. NA stands for missing HLA information. The number of patients at risk for some tpx is lower compared to the number of tpx due to missing HLA information.

Figure 33: Cumulative incidence of graft failure in Liver Tpx recipients by HLA mismatches

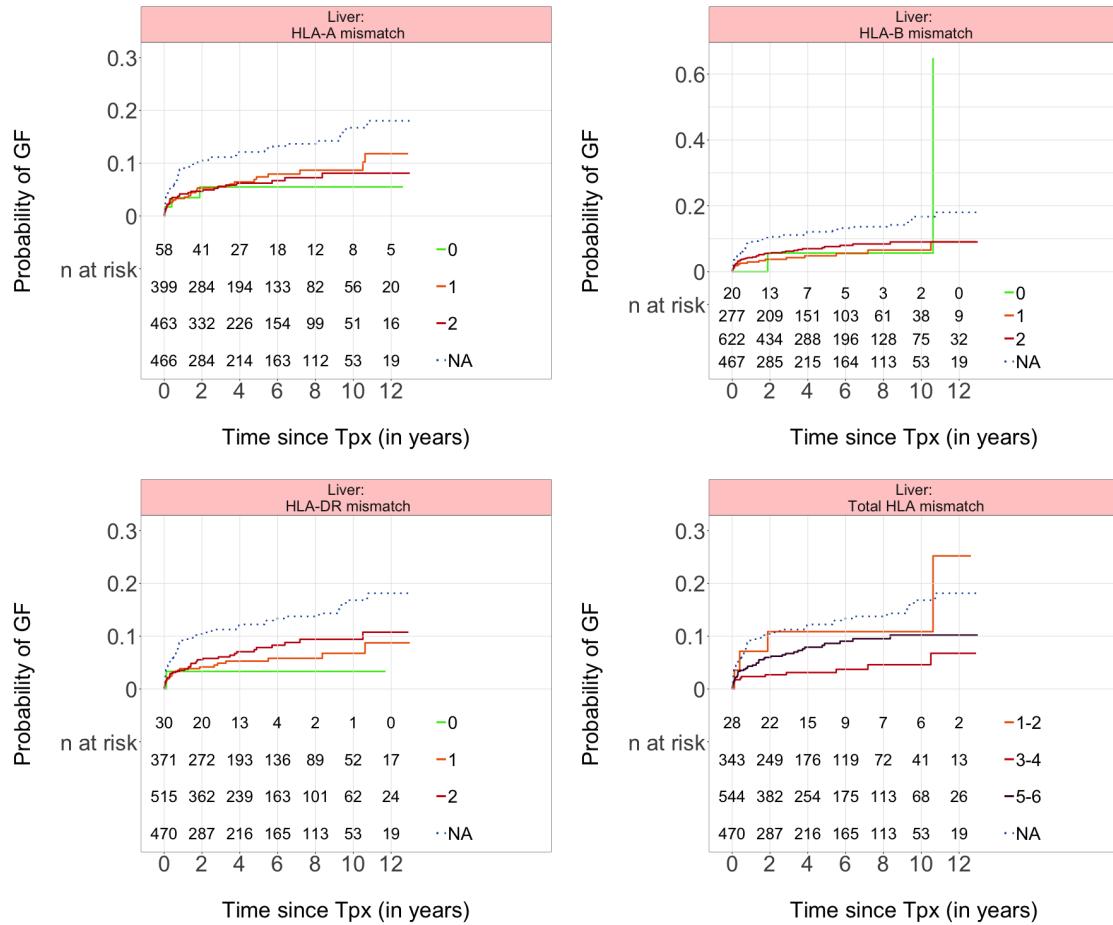


Figure 34: Cumulative incidence of graft failure in Lung Tpx recipients by HLA mismatches

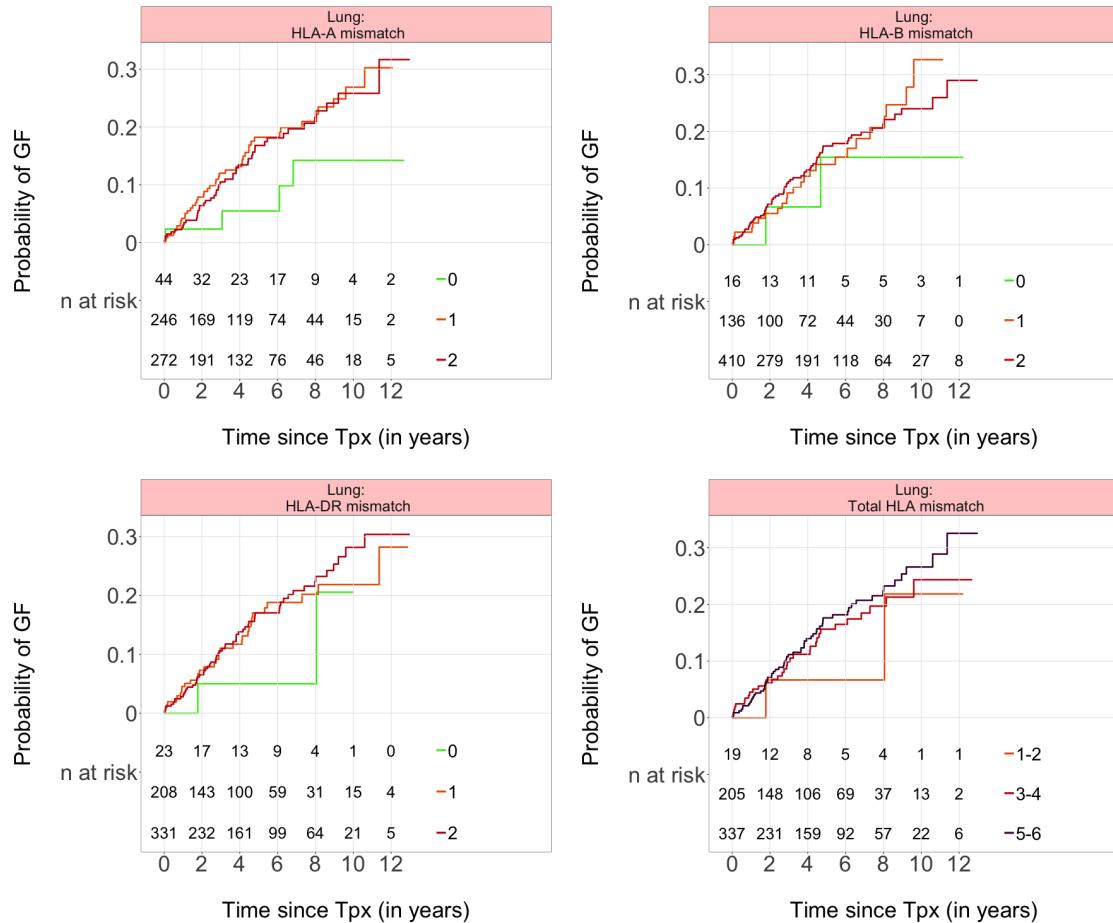
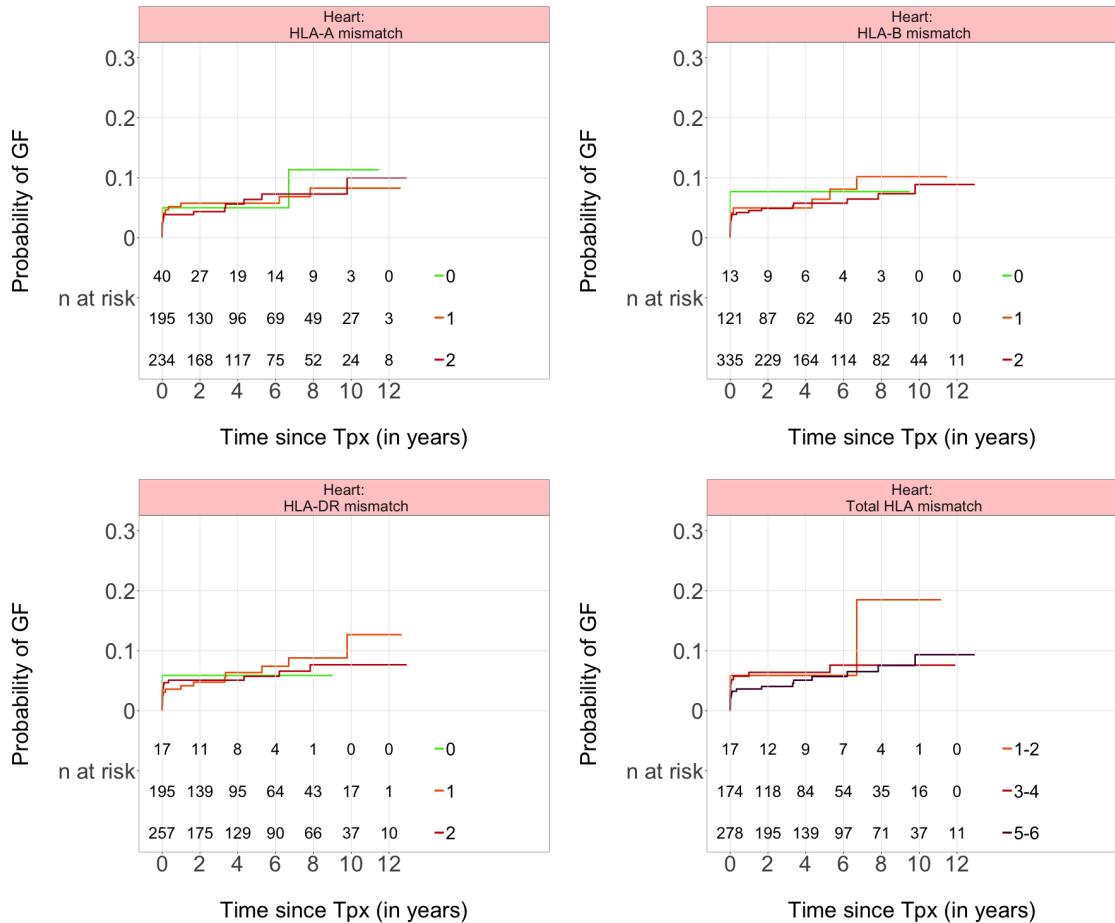


Figure 35: Cumulative incidence of graft failure in Heart Tpx recipients by HLA mismatches



10 Cancer

Results regarding the incidence of cancer and skin cancer have to be considered with caution as data may be incomplete at the moment.

10.1 Cancer other than skin

Table 27: Overview of patients with incident cancer

	N	%
Total number of patients	6311	
Patients with incident cancer (other than skin)	725	11.5
- single record (% of line 2)	485	66.9
- multiple records (% of line 2)	240	33.1

Table 28: Patients with incident cancer

	Patients	Episodes	Median time (in yrs)*
Total	725	1181	3.36
Kidney	403	583	3.84
Liver	217	423	2.94
Lung	71	120	3.50
Heart	25	41	5.16
Pancreas	3	7	6.70
Islets	6	7	6.54

* Median time (in years) from first STCS transplantation to diagnosis of cancer

Remark: Patients are listed regarding the organ transplanted in the first STCS transplantation.

Table 29: Overview of incident cancer occurrence

	N	%
Total	1181	100
Brain	15	1
Breast	36	3
Cervix - Uterus - Adnex	10	1
Colon	35	3
Kaposi	11	1
Kidney	41	4
Leukemia	19	2
Liver	118	10
Lung	102	9
Multiple myeloma/Amyloidosis	6	0
Myeloproliferative disorder/Myelodysplastic syndrome	15	1
Neuroendocrine	14	1
Prostate	72	6
PTLD	119	10
Refused	1	0
Sarkoma	11	1
Testicular cancer	6	0
Thyroid	11	1
Unknown	165	14
Urothel/Bladder	67	6
Cancer of unknown primary origin	6	0
Other	301	26

10.2 Skin cancer

Table 30: Overview of patients with incident skin cancer

	N	%
Total number of patients	6311	
Patients with incident skin cancer	1029	16.3
- single record (% of line 2)	584	56.8
- multiple records (% of line 2)	445	43.2

Table 31: Patients with incident skin cancer

	Patients	Episodes	Median time (in yrs)*
Total	1029	2658	4.22
Kidney	697	1909	4.17
Liver	165	278	3.55
Lung	83	266	4.35
Heart	66	154	5.80
Pancreas	4	24	4.17
Islets	14	27	4.79

* Median time (in years) from first STCS transplantation to diagnosis of skin cancer

Remark: Patients are listed regarding the organ transplanted in the first STCS transplantation.

Table 32: Overview of incident skin cancer occurrence

	N	%
Total	2658	100
Basalioma	722	27
Melanoma	68	3
Refused	1	0
Spinalioma	1110	42
Unknown	185	7
Other	572	22

11 Specific Populations

11.1 DCD Donor Kidney Recipients

Table 33: Kidney patients' characteristics by donor type

	Total	Brain dead (DBD)	NHBD (DCD)	Living
Total no. kidney patients	3598	1908	302	1388
Age (yrs), median	54.4	56.7	57.2	50.4
- IQR	(42.7-63.1)	(45.8-64.8)	(48.1-63.6)	(37.9-60.2)
- min; max	1.53; 82.2	1.53; 82.2	5.77; 77.3	1.6; 79.3
Male gender, n (%)	2288 (63.6%)	1180 (61.8%)	186 (61.6%)	922 (66.4%)
Donor age (yrs), median	54.7	54.7	56.6	54.5
- IQR	(44.8-63.7)	(40.7-65.3)	(48.1-63.8)	(46.3-62.3)
- min; max	0; 88.1	0; 88.1	11.49; 81.9	0; 81.2
Cold ischemia time (yrs), median	6.5	9.3	8.5	1.5
- IQR	(1.9-10)	(7.2-12.3)	(6.9-10.6)	(1.3-2.2)
Pediatric, n (%)	143 (4%)	92 (4.8%)	4 (1.3%)	47 (3.4%)
Observation time (yrs), median	5.2	5.4	2.7	6.0
- IQR	(2.6-8.7)	(2.7-8.9)	(1.2-4.3)	(3.1-9.2)
No. DGF, n (%)	464 (12.9%)	300 (15.7%)	140 (46.4%)	24 (1.7%)
No. deaths, n (%)	435 (12.1%)	301 (15.8%)	20 (6.6%)	114 (8.2%)
No. patients with at least one GF, n (%)	336 (9.3%)	231 (12.1%)	19 (6.3%)	86 (6.2%)
- with GF, alive	235 (6.5%)	159 (8.3%)	13 (4.3%)	63 (4.5%)
- with GF -> death	92 (2.6%)	67 (3.5%)	6 (2%)	19 (1.4%)
- with GF - related death	9 (0.3%)	5 (0.3%)	0 (0%)	4 (0.3%)
Death without GF	334 (9.3%)	229 (12%)	14 (4.6%)	91 (6.6%)

Figure 36: Cumulative Kidney DCD patient enrolment by centre

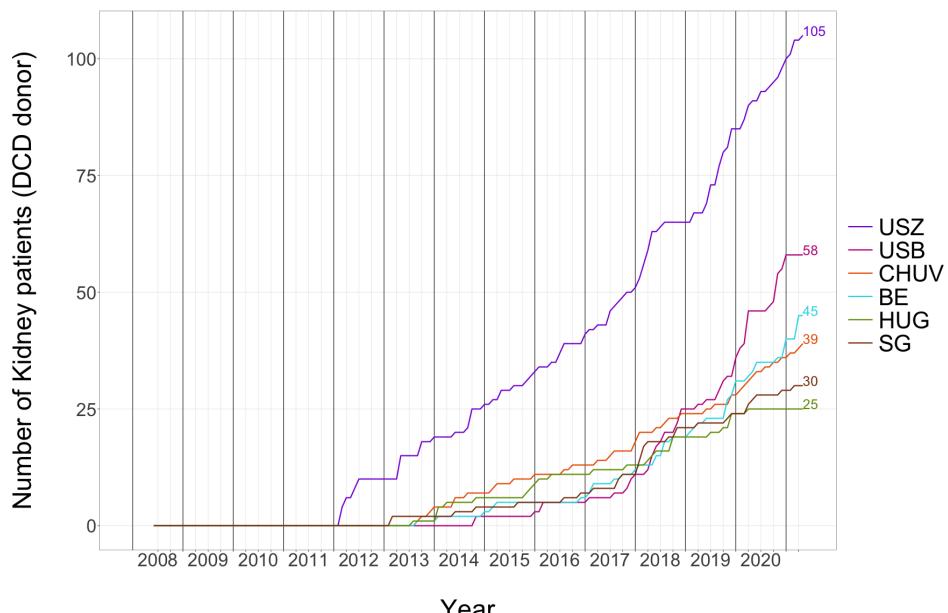


Figure 37: Graft failure free survival in patients with first STCS Kidney Tpx by donor type

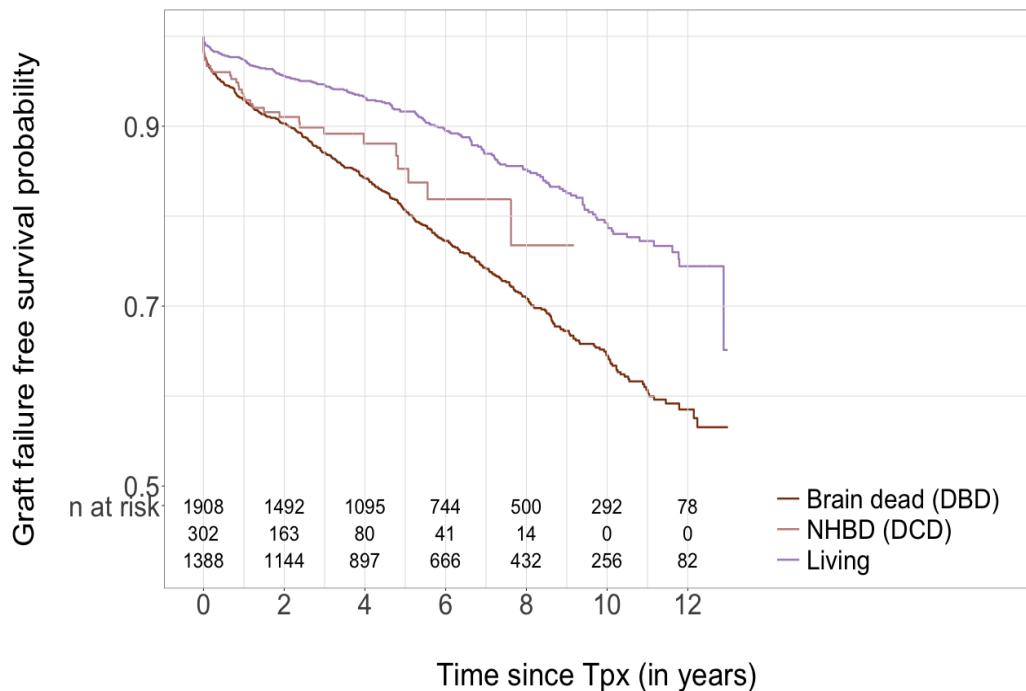
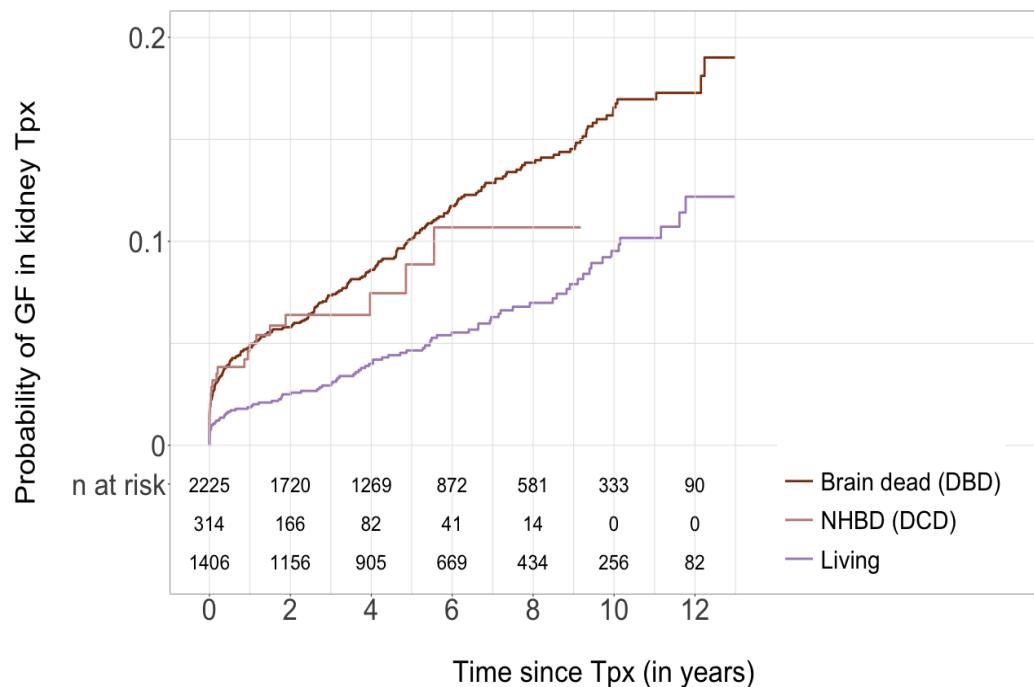


Figure 38: Cumulative incidence of graft failure for Kidney Tpx by donor type



11.2 DCD Donor Liver Recipients

Table 34: Liver patients' characteristics by donor type

	Total	Brain dead (DBD)	NHBD (DCD)	Living
Total no. liver patients	1386	1154	153	79
Age (yrs), median	56.1	55.6	60.2	52.3
- IQR	(46-62.3)	(44.6-62)	(53-65.1)	(38.9-60.8)
- min; max	0.05; 78	0.05; 78	22.85; 72.8	0.05; 70.1
Male gender, n (%)	933 (67.3%)	765 (66.3%)	128 (83.7%)	40 (50.6%)
Donor age (yrs), median	54.5	55.0	60.1	37.1
- IQR	(38.6-67.2)	(38.7-67.7)	(51.8-69.8)	(31.4-45.4)
- min; max	1.23; 88.4	1.23; 88.4	13.63; 87.4	16.18; 68.4
Cold ischemia time (yrs), median	6.4	6.4	6.8	2.0
- IQR	(5.2-7.9)	(5.3-8)	(6-8.1)	(1.5-2.5)
Pediatric, n (%)	112 (8.1%)	104 (9%)	0 (0%)	8 (10.1%)
Observation time (yrs), median	4	4.4	1.7	4.2
- IQR	(1.6-7.8)	(1.9-8.1)	(0.9-3.5)	(2.1-8.5)
No. DGF, n (%)	39 (2.8%)	29 (2.5%)	5 (3.3%)	5 (6.3%)
No. deaths, n (%)	280 (20.2%)	230 (19.9%)	27 (17.6%)	23 (29.1%)
No. patients with at least one GF, n (%)	158 (11.4%)	111 (9.6%)	28 (18.3%)	19 (24.1%)
- with GF, alive	63 (4.5%)	38 (3.3%)	16 (10.5%)	9 (11.4%)
- with GF -> death	51 (3.7%)	37 (3.2%)	8 (5.2%)	6 (7.6%)
- with GF - related death	44 (3.2%)	36 (3.1%)	4 (2.6%)	4 (5.1%)
Death without GF	185 (13.3%)	157 (13.6%)	15 (9.8%)	13 (16.5%)

Figure 39: Cumulative Liver DCD patient enrolment by centre

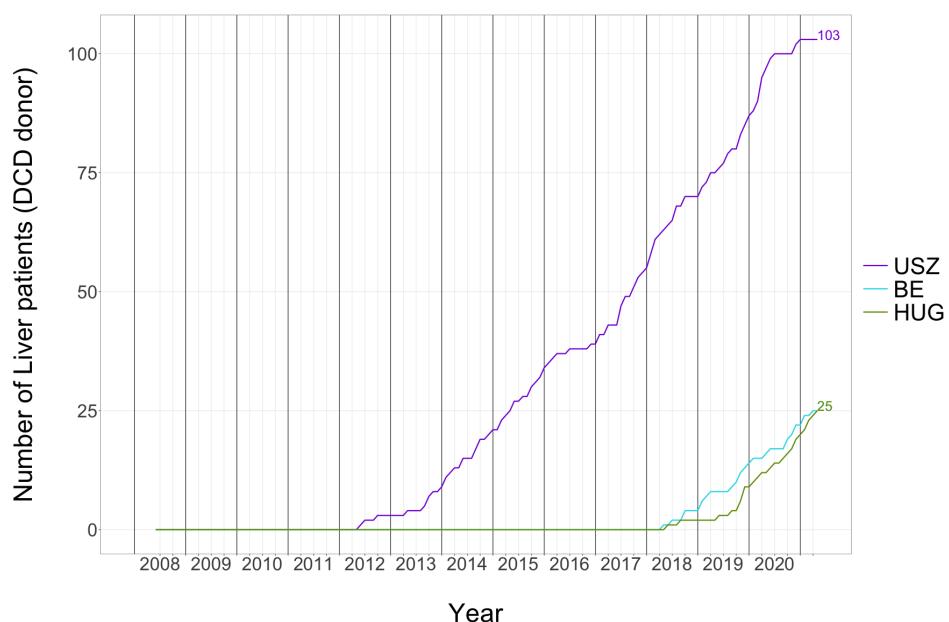
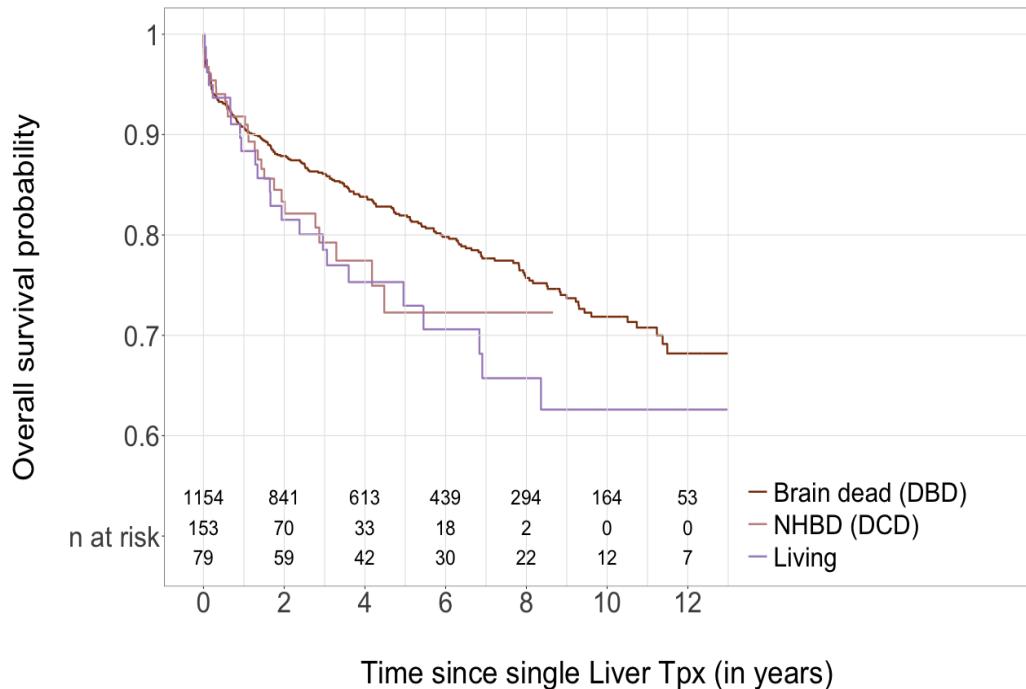


Figure 40: Overall survival in patients with first STCS Liver Tpx by donor type



11.3 Pediatric patients

Table 35: Number of pediatric patients (under 18) by first Tpx type

	Total	USZ	%	USB	%	CHUV	%	BE	%	HUG	%	SG	%
Total	326	110	33.7	8	2.5	37	11.3	47	14.4	121	37.1	3	0.9
Kidney	143	71	49.7	8	5.6	19	13.3	35	24.5	7	4.9	3	2.1
Liver	112	3	2.7	-	-	-	-	1	0.9	108	96.4	-	-
Lung	18	15	83.3	-	-	2	11.1	-	-	1	5.6	-	-
Heart	48	21	43.8	-	-	16	33.3	11	22.9	-	-	-	-
Kidney - Liver	4	-	-	-	-	-	-	-	-	4	100	-	-
Islets - Liver - Lung	1	-	-	-	-	-	-	-	-	1	100	-	-

Table 36: Number of Tpx in pediatric patients by organ and centre

	Total	USZ	%	USB	%	CHUV	%	BE	%	HUG	%	SG	%
Total	342	115	33.6	8	2.3	40	11.7	48	14	128	37.4	3	0.9
Kidney	147	73	49.7	8	5.4	21	14.3	35	23.8	7	4.8	3	2
Liver	117	4	3.4	-	-	-	-	1	0.9	112	95.7	-	-
Lung	21	17	81	-	-	3	14.3	-	-	1	4.8	-	-
Heart	49	21	42.9	-	-	16	32.7	12	24.5	-	-	-	-
Kidney - Liver	5	-	-	-	-	-	-	-	-	5	100	-	-
Islets - Liver - Lung	1	-	-	-	-	-	-	-	-	1	100	-	-

Remark: Patients that are under 18 at baseline might be over 18 at the time of re or second transplantation.

A Mortality in patients with rare Tpx scenarios

Table 37: Overall mortality by rare Tpx scenarios

Tpx	Time	Mortality (%)	95% CI	No at risk	Cum. deaths
Islets	Baseline	0.00	-	40	0
	Overall	34.81	(15.2, 49.9)	-	11
Pancreas	Baseline	0.00	-	13	0
	Overall	44.44	(0, 76.9)	-	2
Small bowel	Baseline	0.00	-	2	0
	Overall	50.00	(0, 87.5)	-	1
Kidney - Liver	Baseline	0.00	-	55	0
	Overall	29.75	(9.6, 45.4)	-	11
Kidney - Islets	Baseline	0.00	-	23	0
	Overall	40.48	(0, 66.2)	-	4
Kidney - Heart	Baseline	0.00	-	14	0
	Overall	14.29	(0, 30.8)	-	2
Kidney - Lung	Baseline	0.00	-	2	0
	Overall	0.00	-	-	0
Liver - Lung	Baseline	0.00	-	4	0
	Overall	33.33	(0, 70)	-	1
Liver - Pancreas	Baseline	0.00	-	1	0
	Overall	0.00	-	-	0
Heart - Lung	Baseline	0.00	-	1	0
	Overall	100.00	-	-	1
Islets - Liver	Baseline	0.00	-	1	0
	Overall	0.00	-	-	0
Pancreas - Small bowel	Baseline	0.00	-	3	0
	Overall	100.00	-	-	2
Kidney - Islets - Liver	Baseline	0.00	-	1	0
	Overall	0.00	-	-	0
Islets - Liver - Lung	Baseline	0.00	-	1	0
	Overall	0.00	-	-	0

Table 38: Overall mortality by rare Tpx scenarios and centre

Tpx - centre	Time	Mortality (%)	95% CI	No at risk	Cum. deaths
Islets - USZ	Baseline	0.0	-	22	0
	Overall	56.2	(27.1, 73.7)	-	11
Islets - HUG	Baseline	0.0	-	18	0
	Overall	0.0	-	-	0
Pancreas - USZ	Baseline	0.0	-	5	0
	Overall	0.0	-	-	0
Pancreas - HUG	Baseline	0.0	-	8	0
	Overall	46.7	(0, 78.6)	-	2
Small bowel - HUG	Baseline	0.0	-	2	0
	Overall	50.0	(0, 87.5)	-	1
Kidney - Liver - USZ	Baseline	0.0	-	20	0
	Overall	16.3	(0, 31.6)	-	3
Kidney - Liver - BE	Baseline	0.0	-	14	0
	Overall	23.6	(0, 48.6)	-	2
Kidney - Liver - HUG	Baseline	0.0	-	21	0
	Overall	45.7	(0, 71.3)	-	6
Kidney - Islets - USZ	Baseline	0.0	-	14	0
	Overall	20.0	(0, 48.4)	-	1
Kidney - Islets - HUG	Baseline	0.0	-	9	0
	Overall	66.7	(0, 92.7)	-	3
Kidney - Heart - USZ	Baseline	0.0	-	3	0
	Overall	33.3	(0, 70)	-	1
Kidney - Heart - CHUV	Baseline	0.0	-	9	0
	Overall	0.0	-	-	0
Kidney - Heart - BE	Baseline	0.0	-	2	0
	Overall	50.0	(0, 87.5)	-	1
Kidney - Lung - CHUV	Baseline	0.0	-	2	0
	Overall	0.0	-	-	0
Liver - Lung - HUG	Baseline	0.0	-	4	0
	Overall	33.3	(0, 70)	-	1
Liver - Pancreas - HUG	Baseline	0.0	-	1	0
	Overall	0.0	-	-	0
Heart - Lung - USZ	Baseline	0.0	-	1	0
	Overall	100.0	-	-	1
Islets - Liver - USZ	Baseline	0.0	-	1	0
	Overall	0.0	-	-	0
Pancreas - Small bowel - USZ	Baseline	0.0	-	1	0
	Overall	100.0	-	-	1
Pancreas - Small bowel - HUG	Baseline	0.0	-	2	0
	Overall	100.0	-	-	1
Kidney - Islets - Liver - HUG	Baseline	0.0	-	1	0
	Overall	0.0	-	-	0
Islets - Liver - Lung - HUG	Baseline	0.0	-	1	0
	Overall	0.0	-	-	0

B Technical summary

All analyses were performed using the statistical software R version 4.0.3 (2020-10-10). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL <https://www.R-project.org/>.