



UNIVERSITY OF THE
WITWATERSRAND,
JOHANNESBURG

**Registry of Transplant Recipients Annual Report:
Paediatric Liver Transplantation**

December 2022

**with contributions from the
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Unit and Wits Donald Gordon Medical Centre Transplant Unit**

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Figure 1: Number of transplants per year

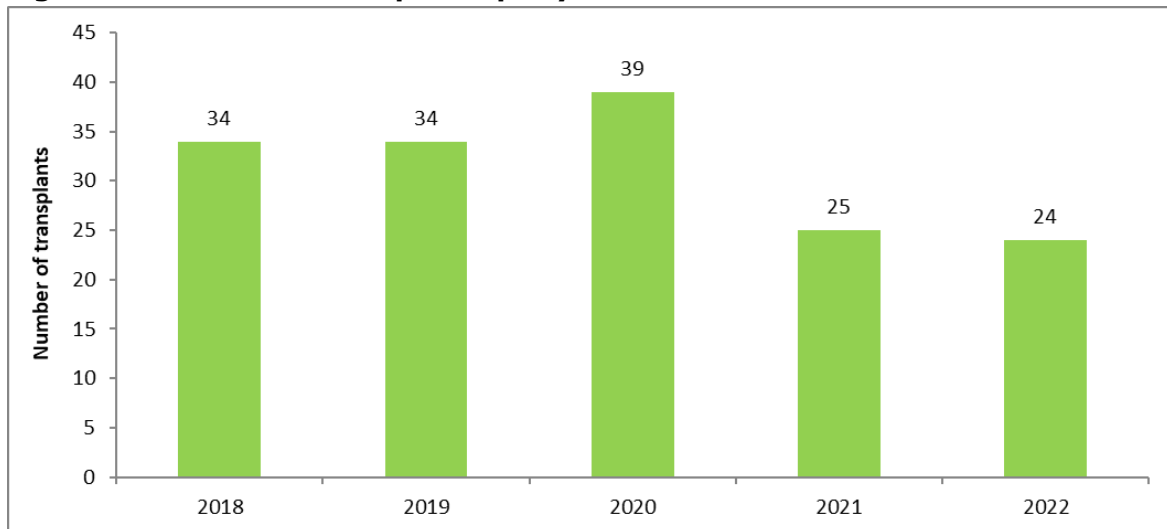


Table 1: Overview of transplants

	2018	2019	2020	2021	2022
Number of transplants	34	34	39	25	24
Donor type (n)					
Living donor transplants	14	21	29	20	19
Deceased donor transplants	20	13	10	5	5
<i>Whole liver</i>	5	7	7	5	4
<i>Split liver</i>	13	4	3	0	1
<i>Reduced liver</i>	2	2	0	0	0

Table 2: Recipient characteristics

	2018	2019	2020	2021	2022
<i>Number of transplants</i>	34	34	39	25	24
Age (%)					
<1 year	9	9	21	4	8
1-5 years	62	59	46	56	54
6-10 years	3	20	10	16	17
11-17 years	26	12	23	24	21
Gender (%)					
Male	44	38	56	44	37
Female	56	62	44	56	63
Ethnicity (%)					
Black	73	73	46	60	54
White	3	18	28	16	25
Indian	6	3	16	8	8
Mixed	18	6	10	16	13
Primary Disease (%)					
Acute liver failure	26	24	13	20	29
Cholestatic disease	50	50	56	48	50
Budd-Chiari - Veno-occlusive disease	3	3	0	0	0
Metabolic disease	9	12	8	20	8
Malignancy	0	3	5	4	4
Other	12	9	18	8	9
Previous Kasai procedure in recipients with biliary atresia (%)					
Yes	47	75	50	73	80
No	53	25	50	27	20
Transplant history (%)					
First	94	94	95	92	96
Re-transplant	6	6	5	8	4
Blood type (%)					
A	29	26	31	32	29
B	29	21	13	16	4
AB	3	9	5	0	0
O	38	44	51	52	67

Table 2: Recipient Characteristics (continued)

	2018	2019	2020	2021	2022
Wait time (%)					
<31 days	44	38	36	40	50
31-60 days	12	3	20	0	8
61-90 days	6	6	0	24	13
3-<6 months	20	21	23	16	8
6-<12 months	3	23	8	8	13
1-<2 years	6	6	13	12	4
2-<3 years	6	3	0	0	0
3 years or longer	3	0	0	0	4
Medical urgency (%)					
Status 1	29	24	13	20	25
MELD/PELD \geq 35	0	3	0	0	0
MELD/PELD 30-34	0	0	3	4	4
MELD/PELD 15-29	35	26	41	16	25
MELD/PELD < 15	35	44	44	60	46
Unknown	0	3	0	0	0

Table 3: Recipient medical characteristics

	2018	2019	2020	2021	2022
<i>Recipients aged <=5y</i>	23	21	26	15	15
Height z-score (%)					
-3 to <-2	44	24	39	27	40
-2 to <-1	26	33	19	33	40
-1 to <0	17	14	15	27	7
0 to <1	0	10	19	0	13
1 or more	4	5	8	13	0
Unknown	9	14	0	0	0
Weight z-score (%)					
-3 to <-2	4	10	12	13	13
-2 to <-1	18	29	35	7	20
-1 to <0	61	28	27	27	27
0 to <1	13	14	11	33	40
1 or more	4	14	15	20	0
Unknown	0	5	0	0	0
Mid Upper Arm Circumference z-score (%)					
-3 to <-2	0	0	0	0	7
-2 to <-1	26	43	19	27	13
-1 to <0	35	14	50	20	33
0 to <1	4	14	12	27	13
1 or more	9	5	8	0	7
Unknown	26	24	11	26	27
<i>Recipients aged >5y</i>	11	13	13	10	9
BMI z-score (%)					
-3 to <-2	18	8	8	10	0
-2 to <-1	27	0	23	30	22
-1 to <0	28	54	15	30	11
0 to <1	27	23	31	20	45
1 or more	0	15	15	10	22
Unknown	0	0	8	0	0
<i>All recipients</i>	34	34	39	25	24
Malnutrition z-score (%)					
-3 to <-2	9	3	5	4	8
-2 to <-1	26	26	21	28	21
-1 to <0	35	33	38	24	25
0 to <1	12	20	18	28	25
1 or more	12	9	15	16	21
Unknown	6	9	3	0	0

Figure 2: Distribution of MUAC z-scores for recipients under the age of 5 years

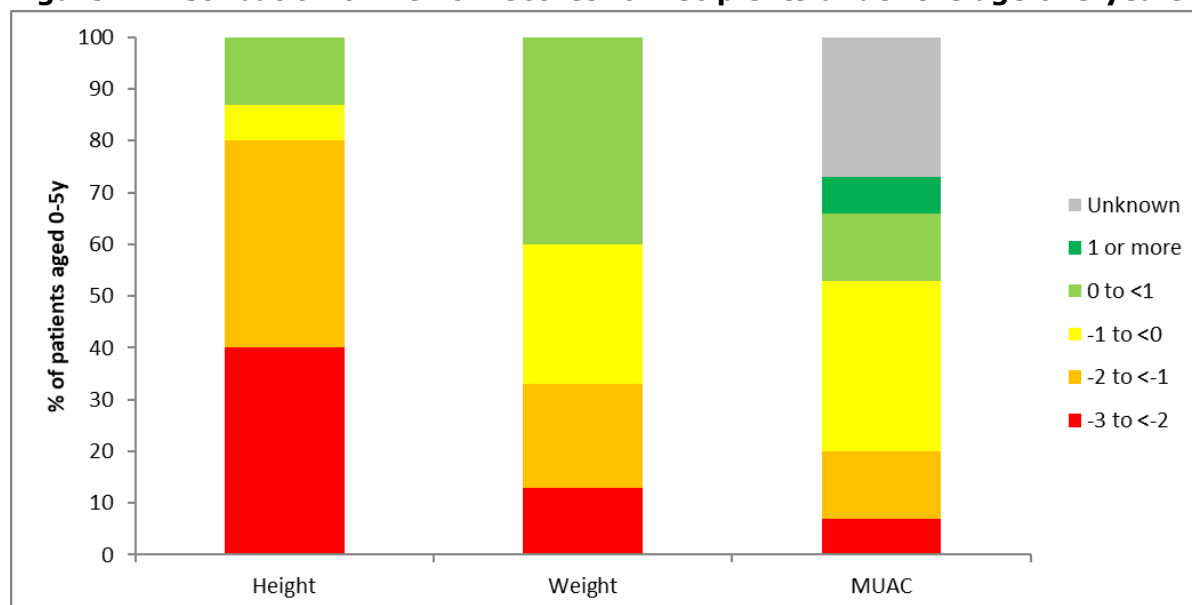


Table 4: Donor characteristics

	2018	2019	2020	2021	2022
<i>Number of transplants</i>	34	34	39	25	24
Blood type (%)					
A	35	29	23	28	21
B	18	18	13	20	8
AB	3	6	5	4	0
O	44	47	59	48	71
<i>Living donors</i>	14	21	29	20	19
Donor relationship to recipient (%)					
Maternal	79	57	66	45	32
Non-maternal	21	43	34	55	68

Table 5: Donor-Recipient blood group compatibility

	2018	2019	2020	2021	2022
<i>Number of transplants</i>	34	34	39	25	24
Blood group compatibility (%)					
ABO identity	74	79	82	64	79
ABO incompatibility-minor	18	12	13	16	13
ABO incompatibility-major	8	9	5	20	8

Table 6: Donor-Recipient serology matching (2022)

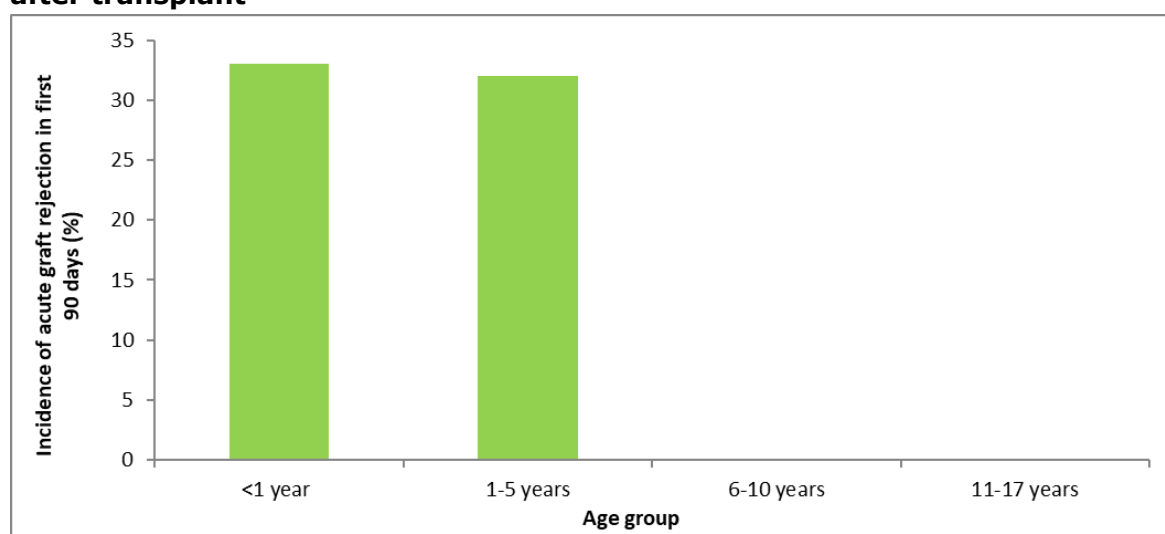
Donor / Recipient	CMV	EBV	Hep B core	Hep B surface antigens	HIV
D- / R-	6	-	67	83	67
D- / R+	6	6	-	-	-
D- / R unknown	6	-	28	11	29
D+ / R-	11	6	-	-	-
D+ / R+	50	61	-	-	-
D+ / R unknown	11	17	-	-	-
D unknown / R-	5	-	5	6	4
D unknown / R+	-	5	-	-	-
D unknown / R unknown	5	5	-	-	-

These data are for recipients aged 18 months and older, except for the HIV data which are for all recipients.

Table 7: Transplant characteristics

	2018	2019	2020	2021	2022
<i>Number of transplants</i>	34	34	39	25	24
Procedure Type (%)					
Liver alone	94	97	100	100	100
Liver and another organ	6	3	0	0	0
Median days in hospital after transplant (Liver alone transplants; excl. deaths pre discharge)	22	20	16	17	21

Figure 3: Incidence of biopsy-proven acute graft rejection in the first 90 days after transplant



These data are based on transplants carried out in the 2.5 years prior to the last 12 months of follow-up, i.e. patients transplanted between 1 Jul 2019 and 31 Dec 2021.

Table 8: Survival

	Patient		Graft	
	Unadjusted	Risk-adjusted	Unadjusted	Risk-adjusted
1-month survival				
<i>Number of transplants</i>		76		76
Survival estimate (%) (95% CI)	95 (86-98)	90 (81-92)	93 (85-97)	87 (79-91)
1-year survival				
<i>Number of transplants</i>		76		76
Survival estimate (%) (95% CI)	85 (75-92)	80 (71-87)	84 (74-91)	78 (69-85)
3-year survival:				
<i>Number of transplants</i>		74		74
Survival estimate (%) (95% CI)	68 (56-77)	71 (59-81)	66 (54-76)	68 (56-79)

All survival estimates are for first transplants and all causes of end-stage liver disease. One-month and one-year patient and graft survival estimates are based on transplants carried out in the 2.5 years prior to the last 12 months of follow-up, i.e. patients transplanted between 1 Jul 2019 and 31 Dec 2021. Three-year patient and graft survival estimates are based on transplants carried out in the 2.5 years prior to the last 3 years of follow-up, i.e. patients transplanted between 1 Jul 2017 and 31 Dec 2019. Risk-adjusted estimates are based on the observed vs estimated deaths (or graft failures) using a model based on transplant number, chronic vs acute liver failure, recipient age and gender. The 3-year survival curves are shown in Appendix A.

Table 9: 1-year survival by selected groups

	Survival (%) (95%CI)	
	Patient	Graft
Sex:		
Female	87 (72-94)	87 (72-94)
Male	83 (67-92)	81 (63-90)
Age:		
0-5y	88 (74-94)	85 (72-93)
6-17y	82 (61-92)	82 (61-92)
Malnutrition z-score (n=62):		
Below -1	79 (53-92)	79 (53-92)
-1 or better	89 (77-95)	87 (79-94)
Acute rejection in the first 90 days (funded healthcare sector patients only):		
No	78 (62-88)	76 (59-86)
Yes	not estimable (no deaths)	

All survival estimates are for first transplants and all causes of end-stage liver disease, based on transplants carried out in the 2.5 years prior to the last 12 months of follow-up, i.e. patients transplanted between 1 Jul 2018 and 31 Dec 2021. There were no statistically significant differences in survival between any of the groups. The survival curves are shown in Appendix B.

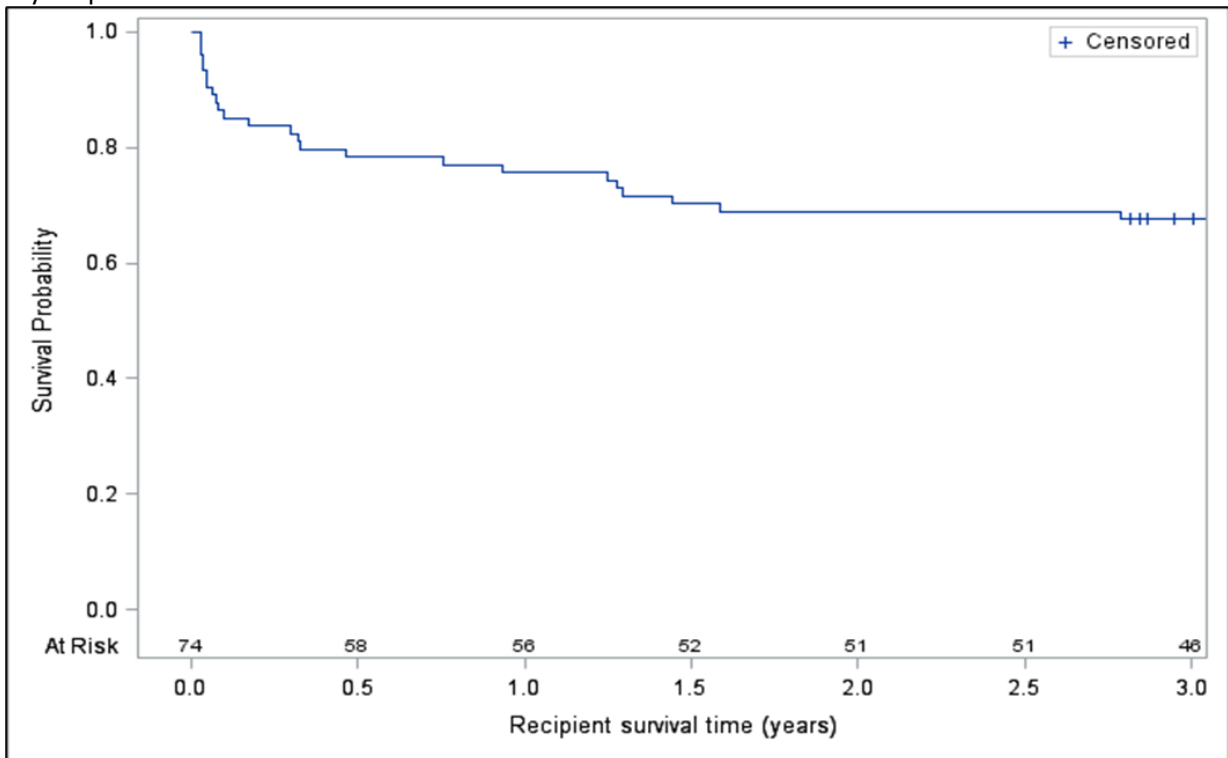
Table 10: Characteristics of paediatric liver transplant candidates on the waiting List on 31 December

	2018	2019	2020	2021	2022
<i>Number of patients</i>	40	22	28	30	35
Age (%)					
<1 year	30	32	18	23	17
1-5 years	45	41	57	50	57
6-10 years	20	9	7	10	9
11-17 years	5	18	18	17	17
Gender (%)					
Male	48	50	43	37	46
Female	52	50	57	63	54
Ethnicity (%)					
Black	85	95	86	94	94
White	3	0	4	3	3
Indian	10	5	7	0	0
Mixed	2	0	3	3	3
Diagnosis of liver failure (%)					
Acute liver failure	5	5	7	10	6
Cholestatic disease	85	64	61	56	54
Budd-Chiari - Veno-occlusive disease	0	0	0	0	0
Metabolic disease	0	13	8	0	6
Malignancy	0	0	0	0	3
Other	10	18	24	34	31
Medical urgency (%)					
MELD/PELD \geq 35	0	13	11	7	6
MELD/PELD 30-34	2	5	3	6	3
MELD/PELD 15-29	40	41	25	27	34
MELD/PELD < 15	58	41	61	57	57
Unknown	0	0	0	3	0
Wait time (%)					
< 1 year	83	32	61	43	34
1-< 2 years	12	50	7	27	20
2-< 3 years	5	14	18	17	23
3-< 4 years	0	4	11	10	12
4-<5 years	0	0	3	3	11

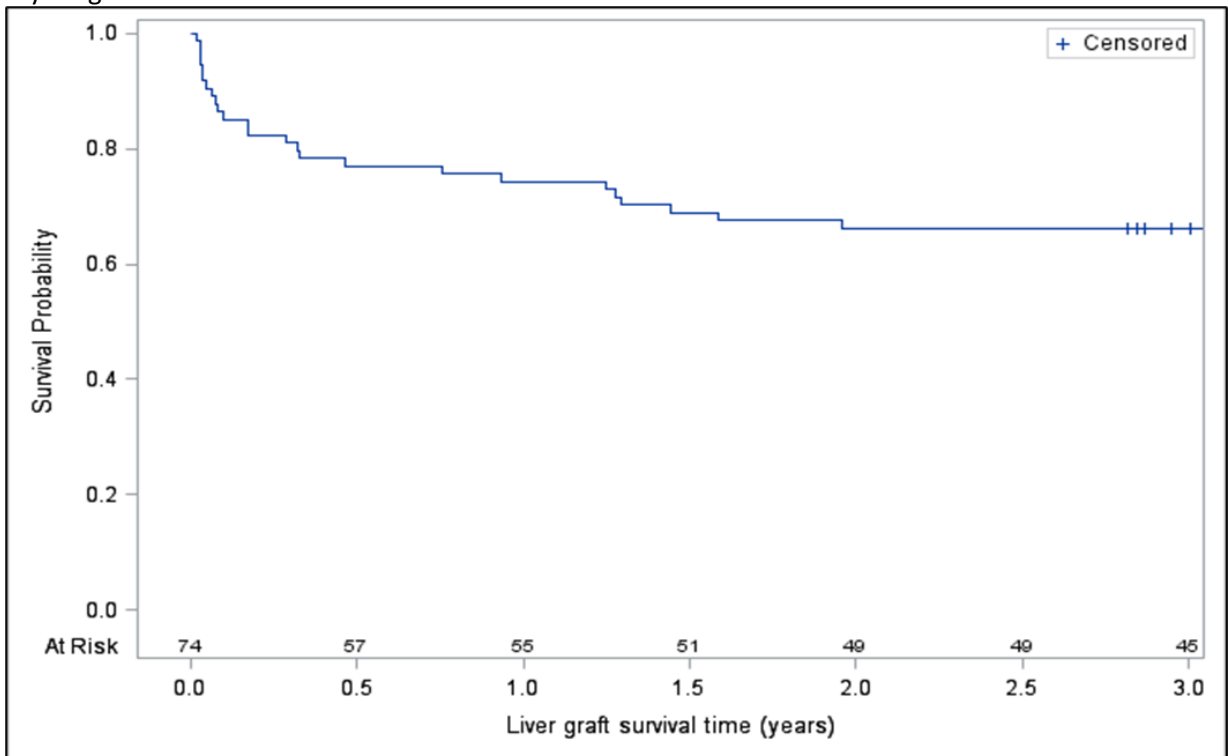
Table 11: Outcome 1 year after listing, of liver transplant candidates

	2017	2018	2019	2020	2021
Patients listed during year	44	72	35	52	34
Status at 1 year after listing (%)					
Transplanted	41	49	71	67	68
Patient died	27	18	20	12	6
Removed from list (for reasons other than death or transplant)	14	8	3	2	3
Still waiting for transplant	18	25	6	19	23

Appendix A:
3-year patient survival:

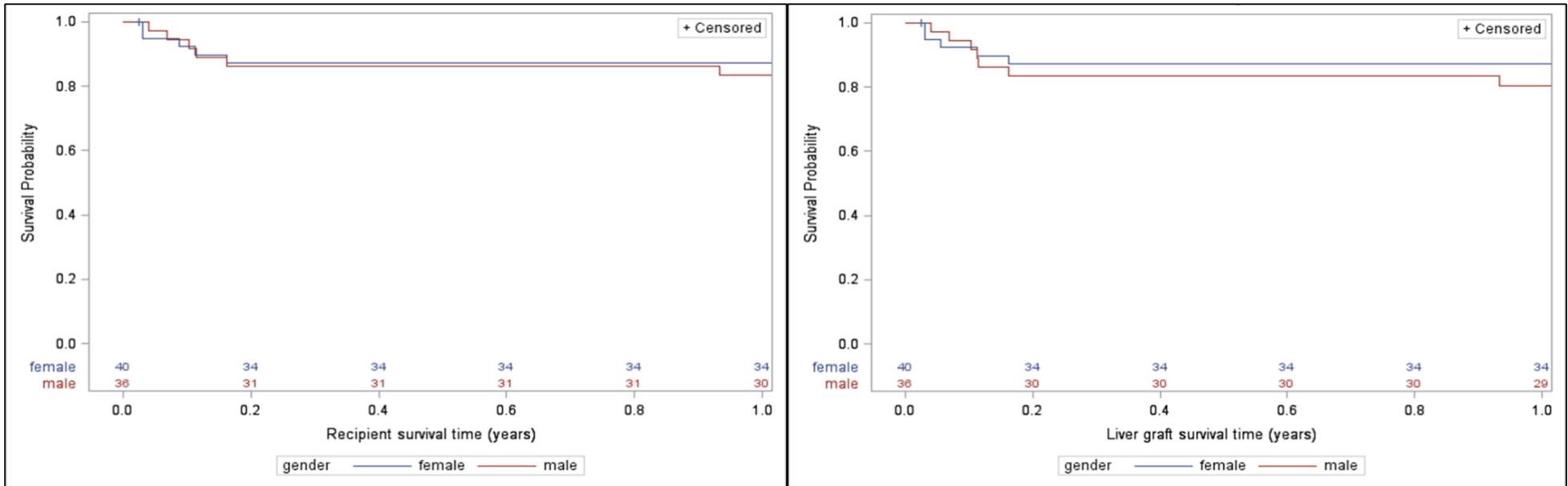


3-year graft survival:

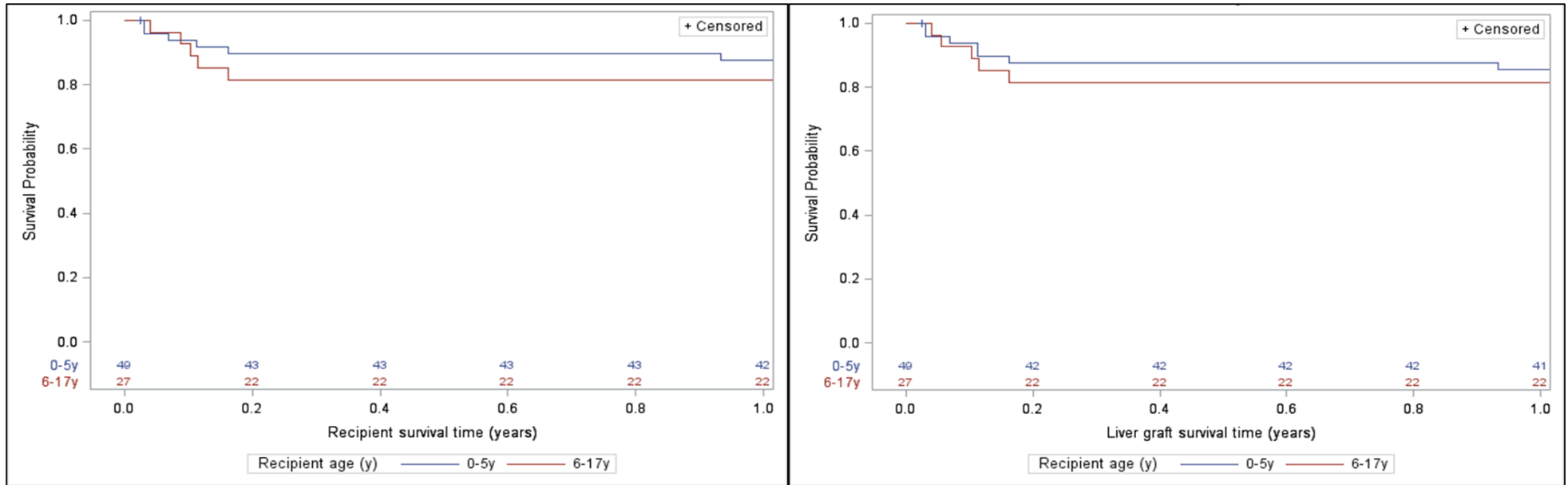


Appendix B:

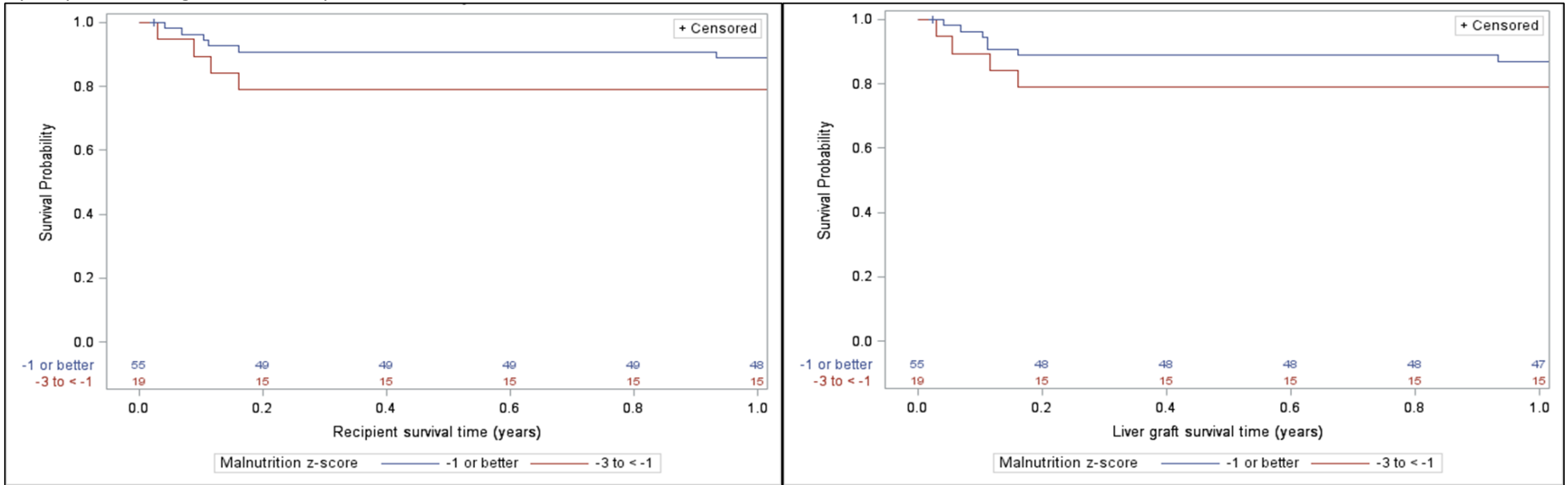
1-year patient and graft survival by gender:



1-year patient and graft survival by age:



1-year patient and graft survival by malnutrition z-score:



1-year patient and graft survival by acute rejection in the first 90 days:

