

Burden of infections in solid organ transplant recipients during long term follow-up

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for the Swiss Transplant Cohort Study



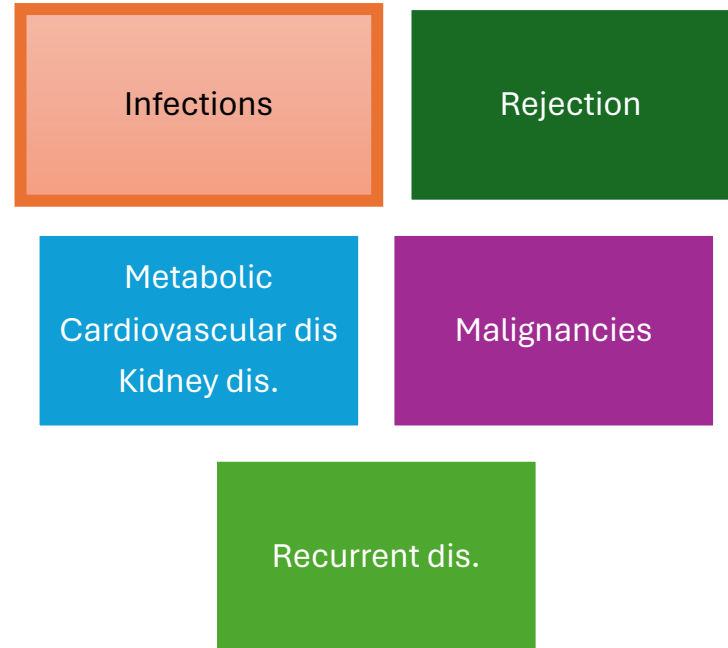
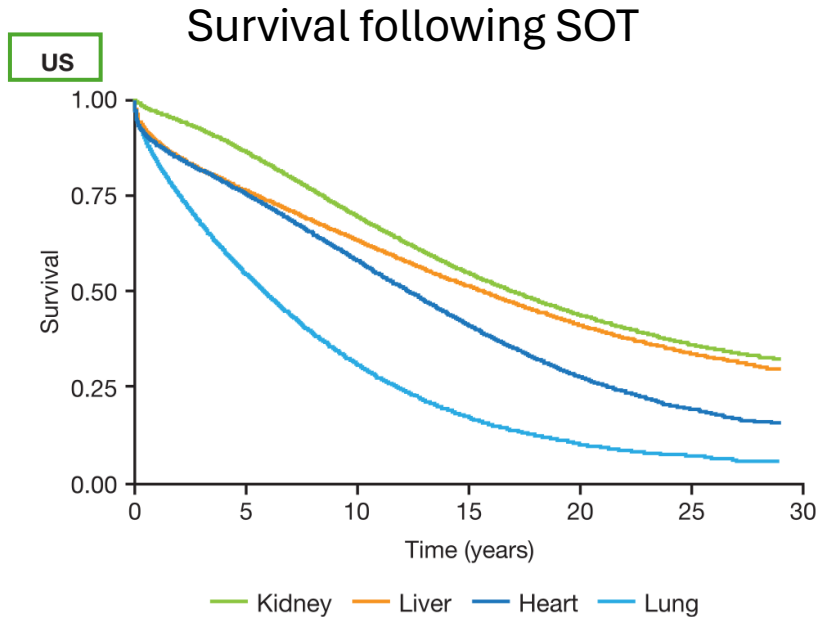
**SWISS TRANSPLANT
COHORT STUDY**



Hôpitaux
Universitaires
Genève



Introduction



Graham C. et al. J Med Economics 2022

Voora S et al. Am J Kidney Dis 2019
Toniutto P et al. Am J Med 2022

Methods: The STCS

- ❖ Recrutement porspectif de tous les SOTr en Suisse
- ❖ Capture les données associées au patient et à la greffe
- ❖ Les dossiers patients informatisés sont prospectivement analysés dans l'ensemble des centres et tous les évènements infectieux sont enregistrés par un infectiologue senior



Methods: Inclusion criteria

- Patients adultes avec consentement disponible
- Date Tx 2008.05.01 – 2020.12.31
- Première transplantation
- Coeur Foie Poumon Rein et Rein+Pancréas SOTr
- Plus de 12 mois de suivi post-transplantation



4 378 SOTr

Methods: Periods and Definitions

0-12m VS >12m

Infections	Proven	Probable
Bacterial	✓	✗
Viral	✓	✓
Fungal	✓	✓
Parasitic	✓	✓
Mycobacterial (NTM and T)	✓	✓

+ Viral syndrome ✓

Results

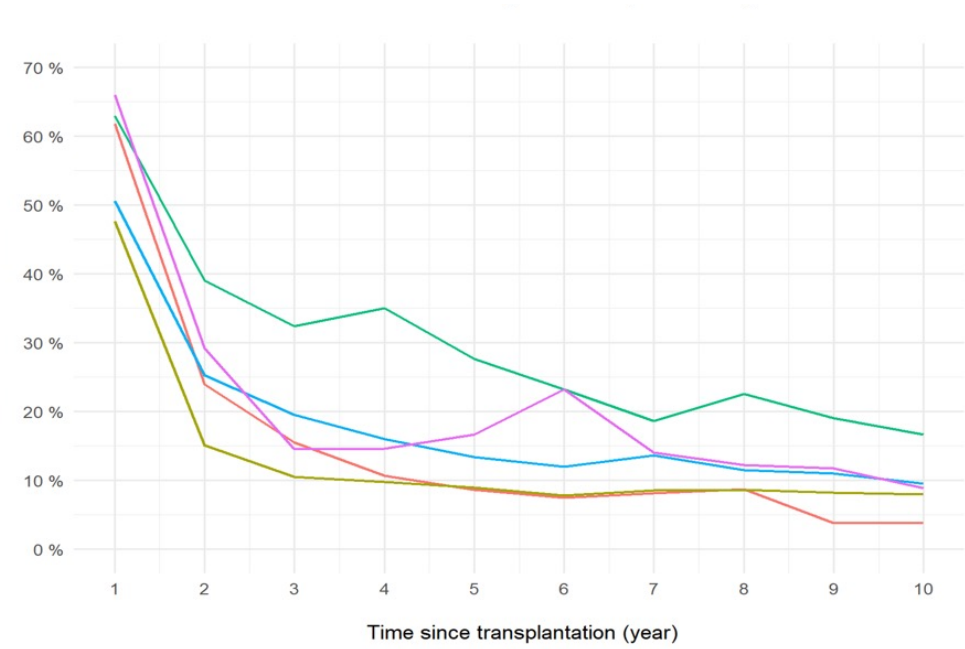
Characteristics	n=4 378
Median age at transplantation, y (IQR)	55 (45; 63)
Male sex	2835 (64.8%)
HLA mismatch - Median (IQR)	4 (3; 5)
CMV status D+/R-	843 (19.3%)
CMV status R+	2616 (59.8%)
First year rejection	1410 (32.2%)
Patients followed at least 5y	2755 (62.9%)
Median time of follow-up, y (IQR)	6.3 (3.91; 9.61)
Total death at >12m	509 (11.6%)
Death by infection at >12m	224 (5.1%)

Results: Incidence rates

	Heart n=330	Liver n=980	Lung n=448	Kidney n=2 514	Kidney Pancreas n=106
	>12m				
At least 1 clinical relevant inf at >12m	49.7%	35.6%	70.5%	52.2%	49.1%
Clinical relevant inf rate, per 1000 Tx-days at >12m	4 0.46	5 0.39	1 1.45	3 0.7	2 0.76
	0-12m				
At least 1 clinical relevant inf at 0-12m	61.8%	47.7%	62.9%	50.6%	66%
Clinical relevant inf rate, per 1000 Tx-days at 0-12m	3 3.41	5 2.32	1 4.34	4 2.91	2 3.57

Results: Rate of infected patients

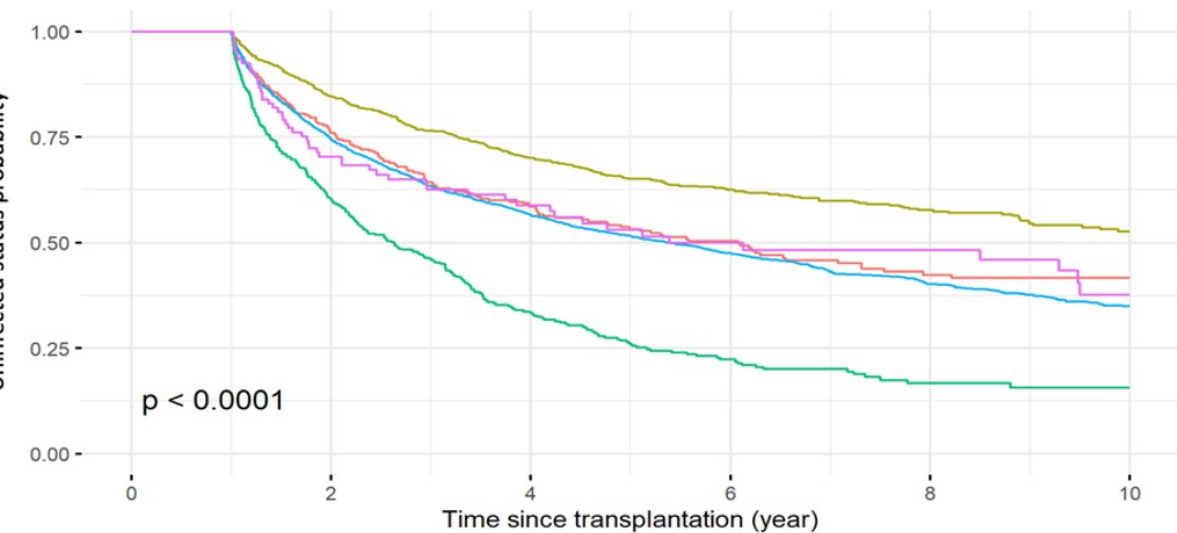
HEART LIVER LUNG KIDNEY KIDNEY PANCREAS



SOTr	% Y1	% Y2	% Y5
All	53%	25%	14%

Results: Uninfected status probability

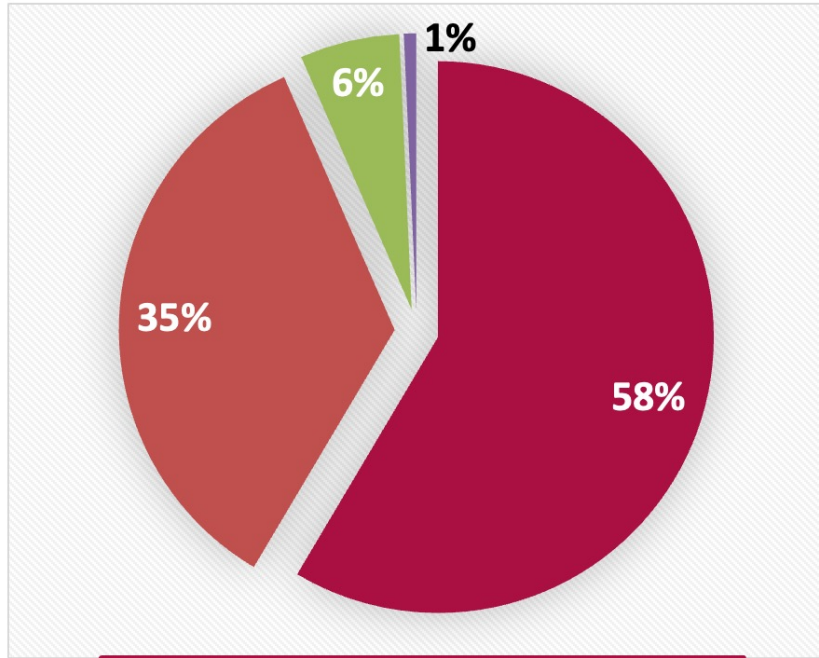
HEART LIVER LUNG KIDNEY KIDNEY PANCREAS



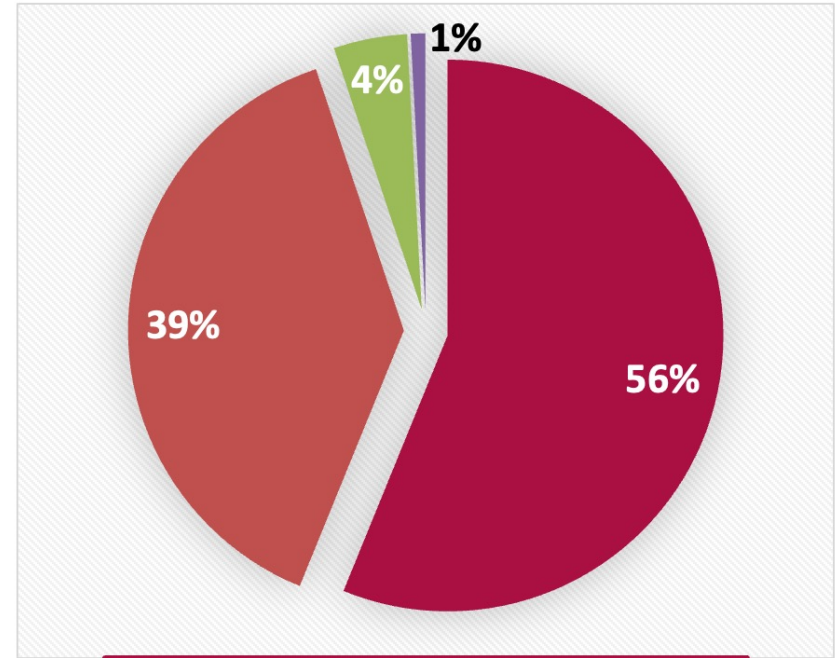
SOTr	Median (y)
Heart	4.6
Liver	-
Lung	2.3
Kidney	4.8
K+P	5.4

Results: Types of infections

■ Bacterial ■ Viral ■ Fungal ■ Parasitic



0-12m n=4 756



>12m n=5 948

Results: types of infections, >12m

	Heart n=330	Liver n=980	Lung n=448	Kidney n=2 514	Kidney Pancreas n=106
Total clinical relevant inf events at >12m	313	727	1128	3607	173
Events with bacteria	43.1%	61.5%	33.1%	65.5%	69.4%
Events with virus	48.2%	35.6%	66.2%	32.2%	27.7%
Events with fungi	7.7%	4.7%	5.8%	3.7%	3.5%
Events with parasites	2.9%	0.1%	0.7%	0.9%	1.2%

Results: types of infections

	All SOTr	
	0-12m	>12m
Total infection species events	5505	6782
Total infected patients	2296	2193
Individual species (% of total events)		
1 Enterococcus spp.	8,70%	4,80%
2 Clostridium spp.	3,00%	1,90%
3 Other gram-positive bacteria	7,80%	8,00%
4 Enterobacteriaceae	30,20%	31,50%
5 Nonfermenting gram-negative bacteria	5,20%	4,60%
6 Opportunistic bacteria	0,40%	0,50%
7 Other bacteria	6,50%	7,00%
8 CMV	5,70%	1,90%
9 Herpes viruses	8,80%	6,50%
10 Hepatitis viruses	1,40%	0,90%
11 Parvo B19	0,10%	0,10%
12 Enteric viruses	1,30%	2,90%
13 Respiratory viruses	10,00%	22,40%
14 Other viruses	4,70%	1,90%
15 Aspergillus species	1,30%	0,70%
16 Candida species	2,90%	1,80%
17 Pneumocystis spp.	0,30%	0,70%
18 Cryptococcus neoformans & Zygomycetes	0,00%	0,10%
19 Other fungi	1,10%	1,00%
20 Parasites	0,60%	0,80%

Discussion Conclusion

- ❖ Précision: plutôt dans le sens de la sous-estimation
- ❖ Infections bactériennes opportunistes peu représentées
- ❖ Fardeau important des infections respiratoires virales
- ❖ Description détaillée des événements infectieux chez 4 378 SOTr
- ❖ Une meilleure compréhension de la trajectoire de ces patients

Thank You



Pr C. van Delden



Dr D. Neofytos



Pr L. Kaiser

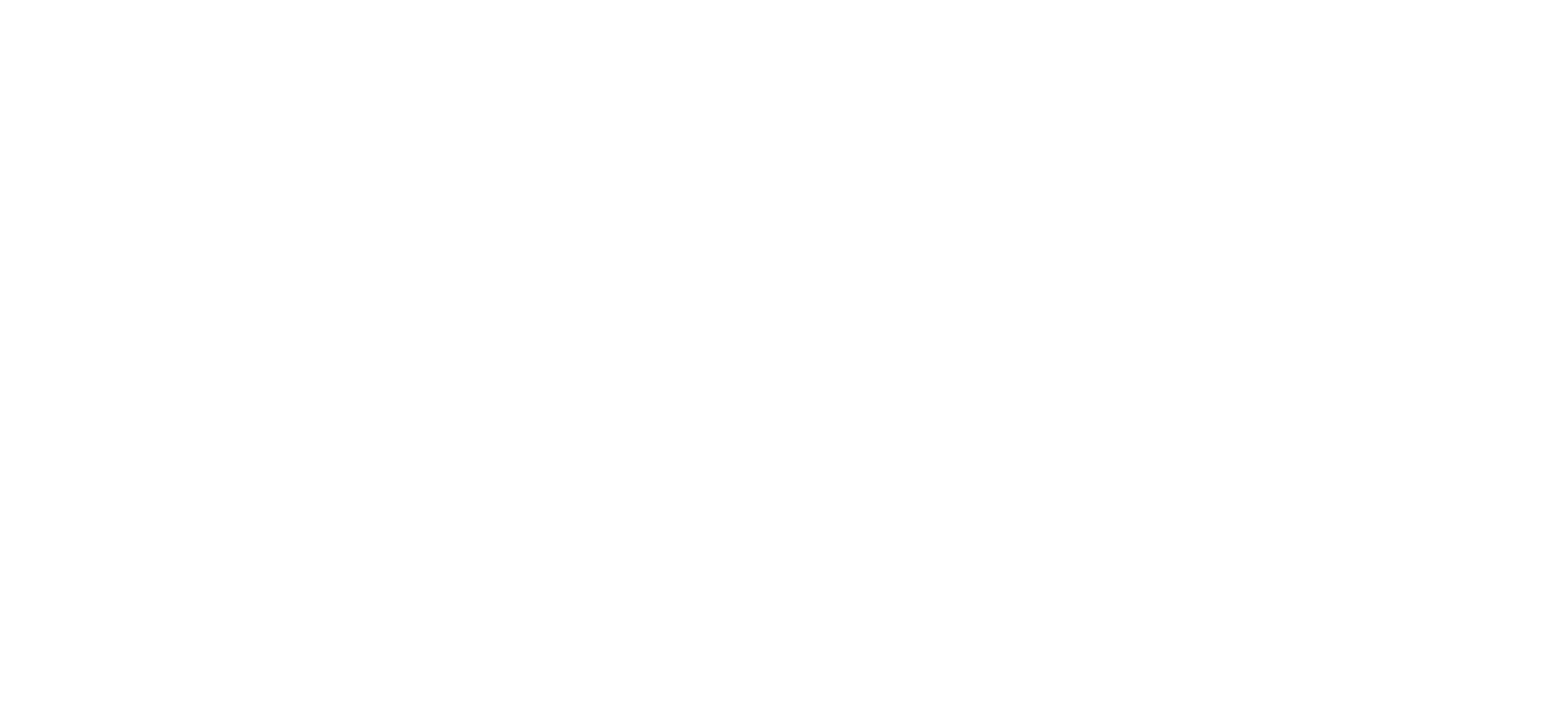


Dr M. Koller and Dr M. Zou



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Data Center

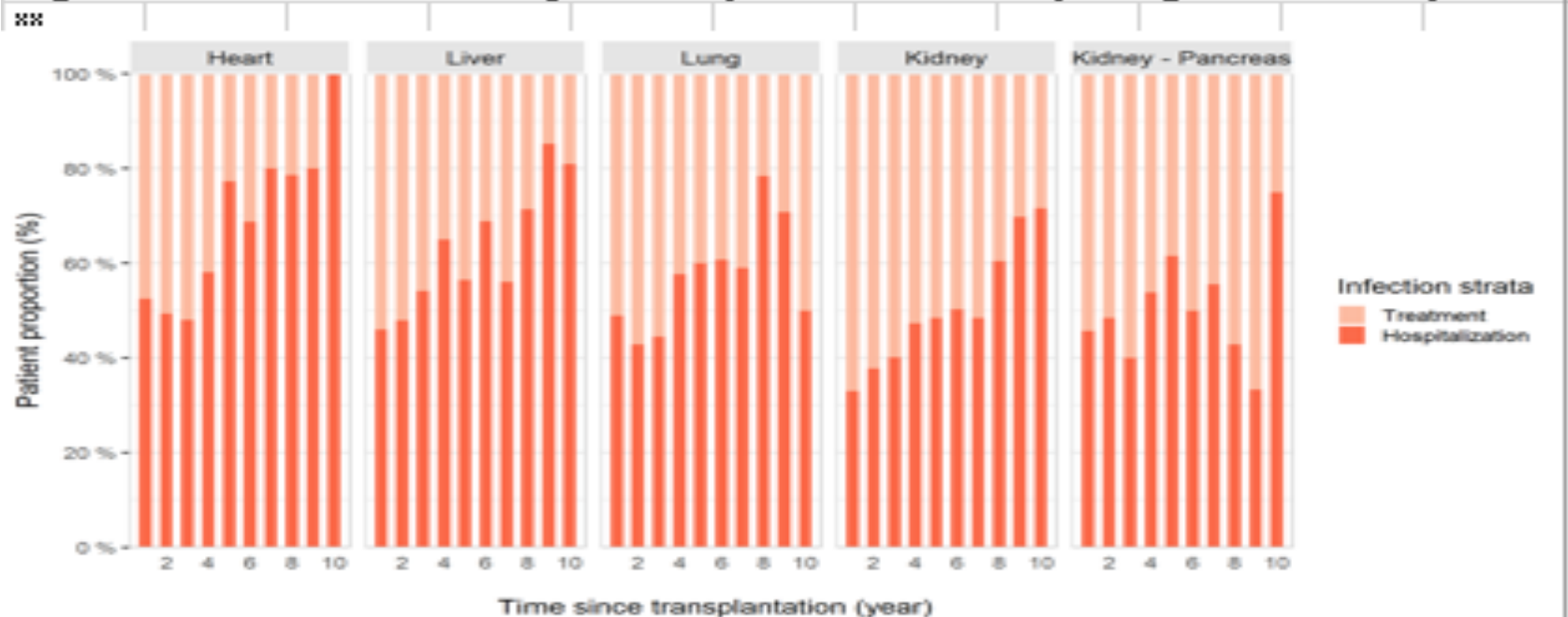


Supp Slides

Hosp infections

	Heart n=330	Liver n=980	Lung n=448	Kidney n=2 514	Kidney Pancreas n=106
At least 1 hospitalized inf at BL 0-12m	130 (39.4%)	325 (33.2%)	173 (38.6%)	531 (21.1%)	47 (44.3%)
At least 1 hospitalized inf at >12m	142 (43%)	332 (33.9%)	276 (61.6%)	948 (37.7%)	47 (44.3%)

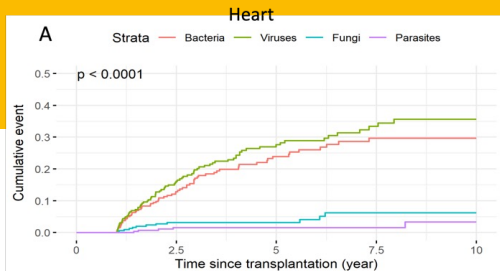
Figure 2.3.1-1. Treatment only and hospitalization of all pathogens infected patient:



Death during first year: not included in the long term follow-up

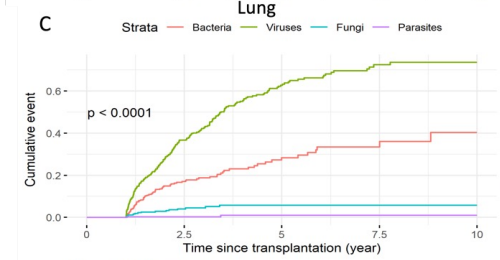
Characteristics	n=4 751
Total valid follow-up <=12m	373 (7.9%)
Total death at BL 0-12m	130 (2.7%)
Death by infection at BL 0-12m	89 (1.9%)

Death
Graft loss
Or loss to fup



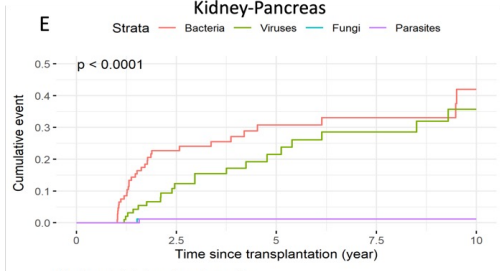
Number at risk (number of events)

330 (0)	217 (38)	115 (61)	63 (66)	39 (68)
330 (0)	217 (46)	115 (73)	63 (80)	39 (82)
330 (0)	217 (9)	115 (9)	63 (12)	39 (12)
330 (0)	217 (4)	115 (4)	63 (4)	39 (5)



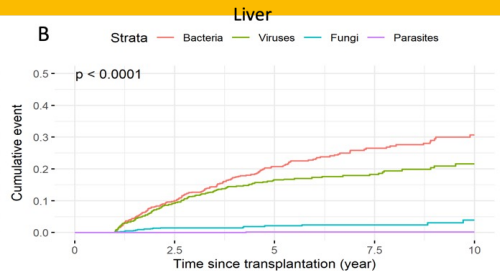
Number at risk (number of events)

448 (0)	208 (61)	69 (78)	25 (82)	7 (84)
448 (0)	208 (143)	69 (210)	25 (224)	7 (225)
448 (0)	208 (14)	69 (17)	25 (17)	7 (17)
448 (0)	208 (1)	69 (2)	25 (2)	7 (2)



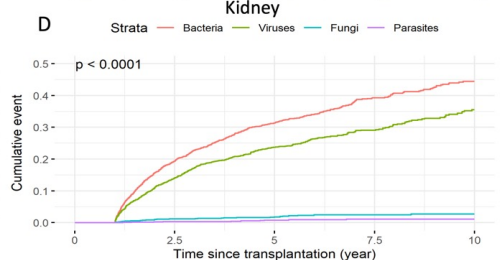
Number at risk (number of events)

108 (0)	59 (23)	34 (38)	23 (29)	12 (31)
108 (0)	59 (10)	34 (15)	23 (18)	12 (20)
108 (0)	59 (1)	34 (1)	23 (1)	12 (1)
108 (0)	59 (1)	34 (1)	23 (1)	12 (1)



Number at risk (number of events)

980 (0)	720 (91)	376 (161)	224 (183)	100 (192)
980 (0)	720 (83)	376 (131)	224 (137)	100 (144)
980 (0)	720 (13)	376 (16)	224 (17)	100 (19)
980 (0)	720 (5)	376 (1)	224 (1)	100 (1)



Number at risk (number of events)

2514 (0)	1587 (444)	871 (642)	437 (718)	211 (748)
2514 (0)	1587 (311)	871 (460)	437 (507)	211 (537)
2514 (0)	1587 (26)	871 (33)	437 (38)	211 (39)
2514 (0)	1587 (8)	871 (12)	437 (14)	211 (14)

SOT	Cumulative incidence 10y Bacteria	Cumulative incidence 10y Virus
Heart	0.3	0.35
Liver	0.31	0.22
Lung	0.41	0.74
Kidney	0.45	0.36
Kidney pancreas	0.42	0.36

infection sites >12m

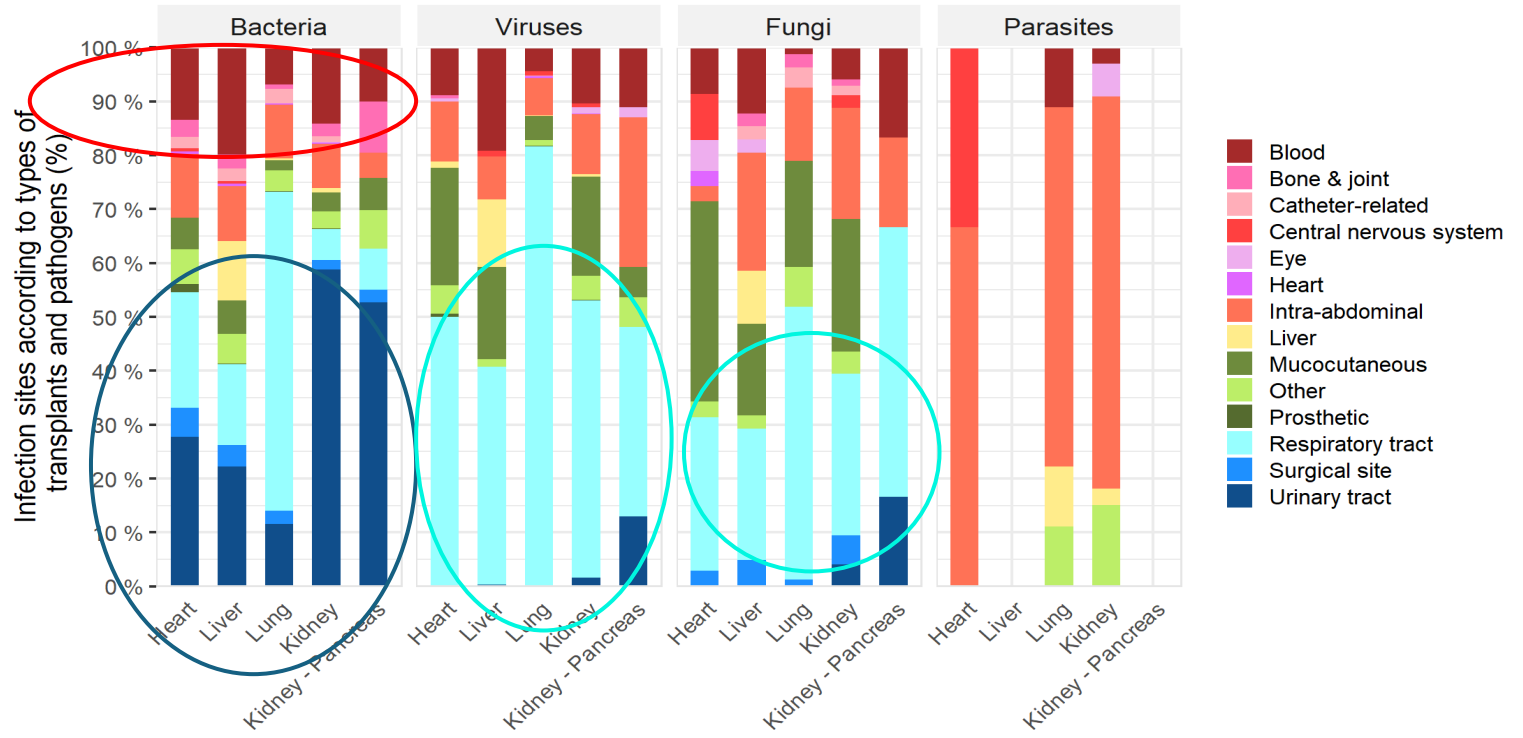


Figure 2.2.1-1. Newly and repeatedly infected patients for all pathogens per year.

