1 **Supplementary material**

2 **Supplementary Table 1 Sensitivity analysis to account for immortal time bias**

Removal of events within 24 months of LT HCC-recurrence and all-cause mortality	Hazard ratio and confidence interval	P value	Multivariate analysis	P value
Statins	1.52 (95% CI 0.70-3.28)	0.29	1.58 (95% CI 0.75-3.31)	0.23
Aspirin	1.38 (95% CI 0.27-8.59)	0.73	1.77 (95% CI 0.26-12.17)	0.56
Metformin	0.72 (95% CI 0.27-1.92)	0.51	0.61 (95% CI 0.23-1.64)	0.33
Removal of events within 24 months of LT HCC-recurrence				
Statins	0.50 (95% CI 0.18-1.39)	0.18	0.52 (95% CI 0.17-1.56)	0.24
Aspirin	N/A		N/A	
Metformin	0.95 (95% CI 0.25-3.60)	0.94	1.00 (95% CI 0.26-3.91)	0.99
Removal of events within 24 months of LT HCC-related mortality				
Statins	N/A		N/A	
Aspirin	N/A		N/A	

Metformin	0.44 (95% CI 0.70-2.78)		N/A	

5 **Supplementary Table 2 Sensitivity analysis to account for immortal time bias**

Removal of events within 12 months of LT				
HCC-recurrence and all-cause mortality	**Hazard ratio and confidence interval**	*P* value	**Multivariate analysis**	*P* value
Statins	1.66 (95% CI 0.76-3.24)	0.23	1.67 (95% CI 0.73-3.01)	0.27
Aspirin	1.35 (95% CI 0.25-7.18)	0.72	0.55 (95% CI 0.34-9.81)	0.55
Metformin	0.84 (95% CI 0.37-1.94)	0.69	1.45 (95% CI 0.30-1.58)	0.38
Removal of events within 12 months of LT HCC-recurrence				
Statins	0.63 (95% CI 0.25-1.59)	0.33	0.57 (95% CI 0.21-1.53)	0.26
Aspirin	0.22 (95% CI 0.027-1.70)	0.15	0.28 (95% CI 0.046-1.69)	0.16
Metformin	1.07 (95% CI 0.36-3.16)	0.91	1.13 (95% CI 0.39-3.29)	0.82

	Hazard ratio and confidence interval	P value	Multivariate analysis	P value
Removal of events within 12 months of LT HCC-related mortality				
Statins	0.50 (95% CI 0.063-3.93)	0.51	0.32 (95% CI 0.032-3.25)	0.34
Aspirin	0.18 (95% CI 0.025-1.35)	0.096	0.24 (95% CI 0.036-1.68)	0.15
Metformin	1.26 (95% CI 0.31-5.14)	0.75	1.50 (95% CI 0.53-4.24)	0.45

1 Events removed within 12 months to account for immortal time bias

2 HCC – Hepatocellular carcinoma, LT – Liver transplantation.

3

4 **Supplementary Table 3 Sensitivity analysis to account for immortal time bias**

	Hazard ratio and confidence interval	P value	Multivariate analysis	P value
Removal of events within 6 months of LT HCC-recurrence and all-cause mortality				
Statins	1.49 (95% CI 0.76-2.93)	0.25	1.43 (95% CI 0.74-2.74)	0.29
Aspirin	1.17 (95% CI 0.25-5.34)	0.84	1.47 (95% CI 0.33-6.55)	0.61
Metformin	0.74 (95% CI 0.32-1.69)	0.47	0.60 (95% CI 0.27-1.35)	0.21

	Hazard ratio and confidence interval	P value	Multivariate analysis	P value
Removal of events within 6 months of LT HCC-recurrence				
Statins	0.75 (95% CI 0.30-1.89)	0.54	0.76 (95% CI 0.31-1.88)	0.56
Aspirin	0.48 (95% CI 0.11 – 2.09)	0.33	0.75 (95% CI 0.22-2.56)	0.64
Metformin	0.98 (95% CI 0.27-3.55)	0.98	0.71 (95% CI 0.17-2.97)	0.64
Removal of events within 6 months of LT HCC-related mortality				
Statins	0.47 (95% CI 0.06-3.67)	0.47	0.32 (95% CI 0.033-3.90)	0.32
Aspirin	0.76 (95% CI 0.15-3.77)	0.74	0.75 (95% CI 0.14-3.93)	0.73
Metformin	1.18 (95% CI 0.20-6.92)	0.85	1.59 (95% CI 0.61-4.10)	0.34

1 Events removed within 6 months to account for immortal time bias

2 HCC – Hepatocellular carcinoma, LT – Liver transplantation

3 MTOR – Mammalian Target of Rapamycin

4

5 **Supplementary Table 4 Sensitivity analysis to account for immortal time bias**

	Hazard ratio and confidence interval	P value	Multivariate analysis	P value

Removal of events within 3 months of LT HCC-recurrence and all-cause mortality		
Statins	1.29 (95% CI 0.64-2.61)	0.48	1.40 (95% CI 0.72-2.73)	0.33
Aspirin	1.09 (95% CI 0.24-5.00)	0.91	1.42 (95% CI 0.31-6.52)	0.66
Metformin	0.74 (95% CI 0.33-1.62)	0.45	0.60 (95% CI 0.26-1.34)	0.21
Removal of events within 3 months of LT HCC-recurrence		
Statins	0.55 (95% CI 0.22-1.38)	0.20	0.52 (95% CI 0.21-1.26)	0.15
Aspirin	0.37 (95% CI 0.08-1.60)	0.18	0.48 (95% CI 0.12-2.00)	0.32
Metformin	1.02 (95% CI 0.37-2.28)	0.97	0.94 (95% 0.34-2.63)	0.91
Removal of events within 3 months of LT HCC-related mortality		
Statins	0.46 (95% CI 0.059-3.55)	0.46	0.31 (95% CI 0.033-2.97)	0.31
Aspirin	0.51 (95% CI 0.11-2.45)	0.40	0.68 (95% CI 0.13-3.48)	0.64

Metformin	1.28 (95% CI 0.36-4.53)		1.54 (95% CI 0.59-3.99)

1 Events removed within 3 months to account for immortal time bias

2 HCC – Hepatocellular carcinoma, LT – Liver transplantation

3 MTOR – Mammalian Target of Rapamycin

4

5 **Supplementary Table 5 Sensitivity analysis to account for immortal time bias –**

6 **mammalian target of rapamycin inhibitor use**

	Univariate analysis	*P* value	Multivariate analysis	*P* value
HCC-recurrence and all-cause mortality				
Removal of events within 12 months of LT	1.43 (95% CI 0.70-2.91)	0.33	0.94 (95% CI 0.47-1.86)	0.86
HCC-recurrence				
Removal of events within 12 months of LT	1.11 (95% CI 0.52-2.37)	0.21	0.80 (95% CI 0.42-1.53)	0.50
HCC-related mortality				
Removal of all events within 24 months of LT	0.26 (95% CI 0.042-1.63)	0.15	N/A	

Removal of events within 12 months of LT	0.88 (95% CI 0.27-2.84)	0.83	0.57 (95% CI 0.21-1.54)	0.27
Removal of all events within 6 months of LT	0.96 (95% CI 0.34-2.71)	0.94	0.61 (95% CI 0.25-1.47)	0.27
Removal of all events within 3 months of LT	0.99 (95% CI 0.35-2.65)	0.94	0.61 (95% CI 0.26-1.45)	0.27

1 Sensitivity analysis for immortal time bias, with removal of evens within 3, 6, 12, 24

2 months of LT; MTORi – Mammalian Target of Rapamycin Inhibitor

3

4 **Supplementary Table 6 Summary characteristics and sensitivity analysis for**

5 **obesity and overweight status**

	Summary characteristics	Summary characteristics		P value
Variable	Total	For HCC recurrence	No HCC recurrence	
Overweight pre-LT (BMI>25)	201 (65.90%)	26 (76.47%)	175 (64.58%)	0.17
Post-LT Obesity	137 (44.92%)	16 (47.06%)	121 (44.65%)	0.79
HCC-related mortality	Univariate analysis	P value	Multivariate analysis	P value
Overweight pre-LT (BMI≥25)	HR 1.65 (95% CI 0.44-6.24)	0.46	HR 1.01 (95% CI 0.43-2.35)	0.98

Post-LT Obesity	HR 1.75 (95% CI 0.51-5.98)	0.37	HR 0.66 (95% CI 0.29-1.51)	0.33

1 Mann-Whitney U test used to compare groups. HCC – Hepatocellular carcinoma, LT

2 – Liver transplantation, BMI – body mass index. Multivariate analysis performed with

3 variables p<0.1 and pre-defined a-priori variables, please see Table 6. Pre-LT Obesity,

4 Post-LT obesity and overweight pre-LT status not included in the same multivariate

5 analysis to avoid co-linearity bias.

6

7 **Supplementary Table 7 Sensitivity analysis for defined daily doses, accounting for**

8 **immortal time bias**

Excluding events within 12 months			Events excluded
HCC-recurrence and all cause mortality	Adjusting for immortality/time bias	P value	
cDDD within 24 months	1.08 (95% CI 0.37-3.18)	0.89	Excluding events within 24 months
cDDD within 12 months	1.12 (95% CI 0.36-3.46)	0.84	Excluding events within 12 months
cDDD within 6 months	1.34 (95% CI 0.44-4.03)	0.61	Excluding events within 6 months
cDDD within 3 months	1.20 (95% CI 0.36-3.95)	0.77	Excluding events within 3 months
cDDD (no events excluded)	0.91 (9% CI 0.36-2.29)	0.84	No events excluded
HCC-recurrence			
cDDD within 24 months	0.48 (95% CI 0.0.06-3.63)	0.48	Excluding events within 24 months
cDDD within 12 months	0.82 (95% CI 0.17-4.08)	0.81	Excluding events within 12 months

cDDD within 6 months	0.95 (95% CI 0.19-4.62)	0.95	Excluding events within 6 months
cDDD within 3 months	1.58 (95% CI 0.37-6.74)	0.58	Excluding events within 3 months
cDDD (no events excluded)	0.59 (95% CI 0.16-2.14)	0.42	No events excluded
HCC-related mortality			
cDDD within 24 months	N/A	N/A	Excluding events within 24 months
cDDD within 12 months	0.90 (95% CI 0.11-7.18)	0.92	Excluding events within 12 months
cDDD within 6 months	1.07 (95% CI 0.14-8.38)	0.95	Excluding events within 6 months
cDDD within 3 months	1.56 (95% CI 0.20-12.09)	0.67	Excluding events within 3 months
cDDD (no events excluded)	0.57 (95% CI 0.073-4.44)	0.59	No events excluded

1 cDDD of statins initiated within 3, 6, 12, 24 months of LT, with the events in the
2 corresponding 3,6,12,24 months removed to account of immortal time bias, HCC –
3 Hepatocellular carcinoma. cDDD – Defined daily doses.