

**Supplementary Table 1. Univariable logistic regression analysis of risk factors for occurrence of LRTI (N = 297) and univariable Cox regression analysis of risk factors for progression from URTI to LRTI (N = 279)**

Covariates	Categories	Odds Ratio	P-values	Hazard Ratio	P-values
		(95% CI)		(95% CI)	
		-occurrence-		-progression-	
Age (years) at HCoV diagnosis	40-60 vs. <40	1.71 (0.81-3.63)	0.16	1.73 (0.65-4.57)	0.27
	>60 vs. <40	1.49 (0.64-3.45)	0.35	1.83 (0.66-5.09)	0.24
	<18 vs. ≥18	0.59 (0.24-1.46)	0.25	0.78 (0.27-2.28)	0.65
Age at diagnosis, yr	as continuous	1.01 (0.99-1.02)	0.29	1.01 (0.99-1.03)	0.38
Gender	Male vs. Female	1.88 (0.94-3.77)	0.08	1.96 (0.78-4.93)	0.15
Year of transplant	2014-2018 vs. 2008-13	1.30 (0.68-2.51)	0.43	1.99 (0.86-4.62)	0.11
Year of transplant	as continuous	1.04 (0.93-1.17)	0.52	1.08 (0.95-1.24)	0.24
Transplant number	Second or higher HCT vs. first HCT	1.48 (0.69-3.14)	0.31	2.35 (1.01-5.49)	0.05
Stem cell source	Bone marrow vs. Peripheral blood stem cell	0.80 (0.31-2.03)	0.63	0.83 (0.24-2.84)	0.77
	Cord blood vs. Peripheral blood stem cell	1.58 (0.66-3.76)	0.31	2.03 (0.74-5.60)	0.17

<b>Donor type</b>	Unrelated vs. Related	0.85 (0.43-1.66)	0.63	0.64 (0.29-1.40)	0.26
<b>Human leukocyte antigen</b>	Others vs. Matched/Related	1.33 (0.60-2.91)	0.48	1.16 (0.46-2.90)	0.76
<b>Recipient blood type</b>	O vs. Others (including missing)	1.42 (0.72-2.82)	0.32	1.62 (0.69-3.82)	0.27
	B vs. Others (including missing)	0.59 (0.16-2.15)	0.42	0.74 (0.16-3.50)	0.71
<b>Donor blood type</b>	O vs. Others (including missing)	0.99 (0.50-1.95)	0.97	0.98 (0.42-2.26)	0.96
	B vs. Others (including missing)	0.82 (0.26-2.59)	0.74	1.18 (0.33-4.23)	0.80
<b>Conditioning regimen</b>	Myeloablative vs. Non-myeloablative	1.16 (0.58-2.30)	0.68	1.00 (0.44-2.28)	0.99
<b>Body habitus<sup>a</sup></b>	Overweight vs. Underweight/Normal	1.65 (0.78-3.51)	0.19	1.47 (0.60-3.63)	0.40
	Obese vs. Underweight/Normal	1.30 (0.57-2.97)	0.54	1.14 (0.40-3.20)	0.81
<b>Diabetic state at HCT</b>	Yes vs. No	1.01 (0.28-3.66)	0.98	0.44 (0.06-3.34)	0.43
	Missing vs. No	0.87 (0.38-2.00)	0.74	1.41 (0.56-3.58)	0.46
<b>Smoking status</b>	Never vs. Others	1.00 (0.46-2.15)	0.10	1.33 (0.50-3.56)	0.57
<b>Recipient CMV status</b>	(+) vs. (-)	1.20 (0.60-2.42)	0.61	0.91 (0.40-2.06)	0.82
<b>Donor CMV status</b>	(+) vs. (-)	0.69 (0.35-1.35)	0.28	0.81 (0.36-1.80)	0.60
<b>Days between date of HCT and onset of HCoV infection</b>	31-365 vs. <=30	1.16 (0.44-3.04)	0.76	1.60 (0.58-4.42)	0.37
	>365 vs. <=30	0.88 (0.31-2.53)	0.81	0.73 (0.19-2.77)	0.65

<b>Days between date of HCT and onset of HCoV infection</b>	Lower quartile (57) – median (155) vs. <= lower quartile (57)	1.25 (0.46-3.37)	0.66	2.33 (0.78-6.95)	0.13
	Median (155) – upper quartile (474) vs. <= lower quartile (57)	2.19 (0.88-5.46)	2.19	2.07 (0.76-5.60)	0.15
	> upper quartile (474) vs. <= lower quartile (57)	0.94 (0.33-2.66)	0.91	0.52 (0.11-2.55)	0.42
<b>Acute GVHD as time-dependent</b>	Grade 2-4 vs. Grade 0-1			0.80 (0.25-2.51)	0.70
<b>Chronic GVHD as time-dependent</b>	Yes vs. None			0.48 (0.14-1.61)	0.24
<b>HCoV Ct values</b>	>median (26.2) vs. <=median (26.2)	2.24 (0.99-5.04)	0.05	3.01 (1.12-8.11)	0.03
	Missing vs. <=median (26.2)	1.67 (0.69-4.02)	0.25	1.26 (0.42-3.76)	0.68
<b>HCoV Ct values</b>	>lowest 20th percentile (22.4) vs. <=lowest 20th percentile (22.4)	1.80 (0.59-5.46)	0.30	1.50 (0.43-5.19)	0.53
	Missing vs. <=lowest 20th percentile (22.4)	1.71 (0.52-5.61)	0.37	0.98 (0.25-3.83)	0.98

<b>Copathogen in upper respiratory tract<sup>b</sup></b>	Yes vs. No	2.08 (1.04-4.18)	0.04	1.92 (0.85-4.34)	0.12
<b>Copathogen in blood<sup>c</sup></b>	Yes vs. No	2.14 (0.93-4.91)	0.07	1.49 (0.55-3.99)	0.43
<b>Immunodeficiency scoring index<sup>b</sup></b>	Moderate (3-6) vs. Low (0-2)	13.6 (1.83-101)	0.01		
	High (7-11) vs. Low (0-2)	22.9 (2.58-204)	<0.01		
	as continuous	1.27 (1.10-1.48)	<0.01	1.16 (0.98-1.36)	0.08
<b>Neutrophil count (x10<sup>6</sup> cells/L)<sup>d</sup></b>	<=500 vs. >500	2.33 (0.86-6.33)	0.10	1.36 (0.45-4.11)	0.58
	Missing vs. >500	2.21 (0.82-5.96)	0.12	1.63 (0.48-5.56)	0.43
<b>Lymphocyte count (x10<sup>6</sup> cells/L)<sup>d</sup></b>	<=300 vs. >300	1.24 (0.51-3.02)	0.64	1.06 (0.39-2.89)	0.91
	Missing vs. >300	1.87 (0.70-5.00)	0.21	1.50 (0.44-5.14)	0.52
	<=200 vs. >200	1.30 (0.46-3.64)	0.62	1.07 (0.36-3.20)	0.90
	Missing vs. >200	1.86 (0.70-4.95)	0.22	1.50 (0.44-5.11)	0.51
	<=100 vs. >100	1.63 (0.44-6.06)	0.47	1.40 (0.41-4.80)	0.59
	Missing vs. >100	1.86 (0.70-4.93)	0.21	1.55 (0.46-5.23)	0.48

<b>Monocyte count (x10<sup>6</sup> cells/L)<sup>d</sup></b>	<=300 vs. >300	2.15 (1.05-4.38)	0.04	1.56 (0.66-3.65)	0.31
	Missing vs. >300	2.34 (0.85-6.45)	0.1	1.74 (0.49-6.11)	0.39
	<=200 vs. >200	2.63 (1.21-5.70)	0.02	1.66 (0.67-4.10)	0.27
	Missing vs. >200	2.25 (0.83-6.11)	0.11	1.70 (0.49-5.89)	0.40
	<=100 vs. >100	3.55 (1.52-8.30)	<0.01	1.96 (0.76-5.07)	0.17
	Missing vs. >100	2.23 (0.83-6.02)	0.11	1.71 (0.50-5.90)	0.39
<b>Albumin (g/dl)<sup>e</sup></b>	<=3 vs. >3	3.46 (1.68-7.13)	<0.01	0.99 (0.38-2.56)	0.98
	Missing vs. >3	0.50 (0.11-2.24)	0.37	0.54 (0.12-2.38)	0.42
<b>Glucose (mg/dl)<sup>d</sup></b>	>150 vs. <=150	3.57 (1.68-7.57)	<0.01	2.46 (1.02-5.95)	0.05
	Missing vs. <=150	1.16 (0.44-3.03)	0.77	0.98 (0.32-3.04)	0.97
<b>Steroid dose (mg/kg)<sup>f</sup></b>	<1 vs. None	2.29 (1.10-4.77)	0.03	2.09 (0.83-5.25)	0.12
	>=1 vs. None	2.90 (0.98-8.59)	0.05	2.80 (0.89-8.86)	0.08
<b>Combined steroid and glucose (mg/dl)<sup>d,f</sup></b>	Steroid + Glucose (<=150 or unknown) vs. No steroid	1.65 (0.76-3.58)	0.21	1.53 (0.58-4.02)	0.39
	Steroid + Glucose (>150) vs. No steroid	6.29 (2.53-15.7)	<0.01	5.58 (2.01-15.5)	<0.01

<b>Glucose (mg/dl)</b> <sup>g</sup>	>150 on most recent day only vs. <=150 or unknown	2.88 (0.94-8.81)	0.06	2.87 (0.82-10.0)	0.10
	>150 on most recent day and >150 on another day vs. <=150 or unknown	3.56 (1.49-8.50)	<0.01	2.07 (0.74-5.77)	0.17
	Any glucose value other than most recent >150 vs. <=150 or unknown	0.78 (0.28-2.16)	0.63	0.72 (0.21-2.52)	0.61
<b>HbA1c</b> <sup>h</sup>	>=6.5 vs. <6.5	0.96 (0.21-4.38)	0.96	1.29 (0.13-12.6)	0.83
	Missing vs. <6.5	0.59 (0.24-1.47)	0.26	0.96 (0.29-3.23)	0.95

<sup>a</sup> Overweight is defined as a body mass index (BMI)  $\geq 25$  and  $< 30$  for adults, and  $\geq 85^{\text{th}}$  percentile and  $< 95^{\text{th}}$  percentile for children of the same age and sex. Obesity is defined as a BMI  $\geq 30$  for adults, and  $\geq 95^{\text{th}}$  percentile for children of the same age and sex according to the Centers for Disease Control and Prevention.

<sup>b</sup> at HCoV diagnosis.

<sup>c</sup> defined as a pathogen or antigen (bacteria, fungi, virus, Aspergillus galactomannan enzyme-linked immunosorbent assay) detected in a blood within 2 days of HCoV diagnosis.

<sup>d</sup> using nearest value within 2 weeks before HCoV diagnosis.

<sup>e</sup> lowest albumin value in the 2 weeks before HCoV diagnosis.

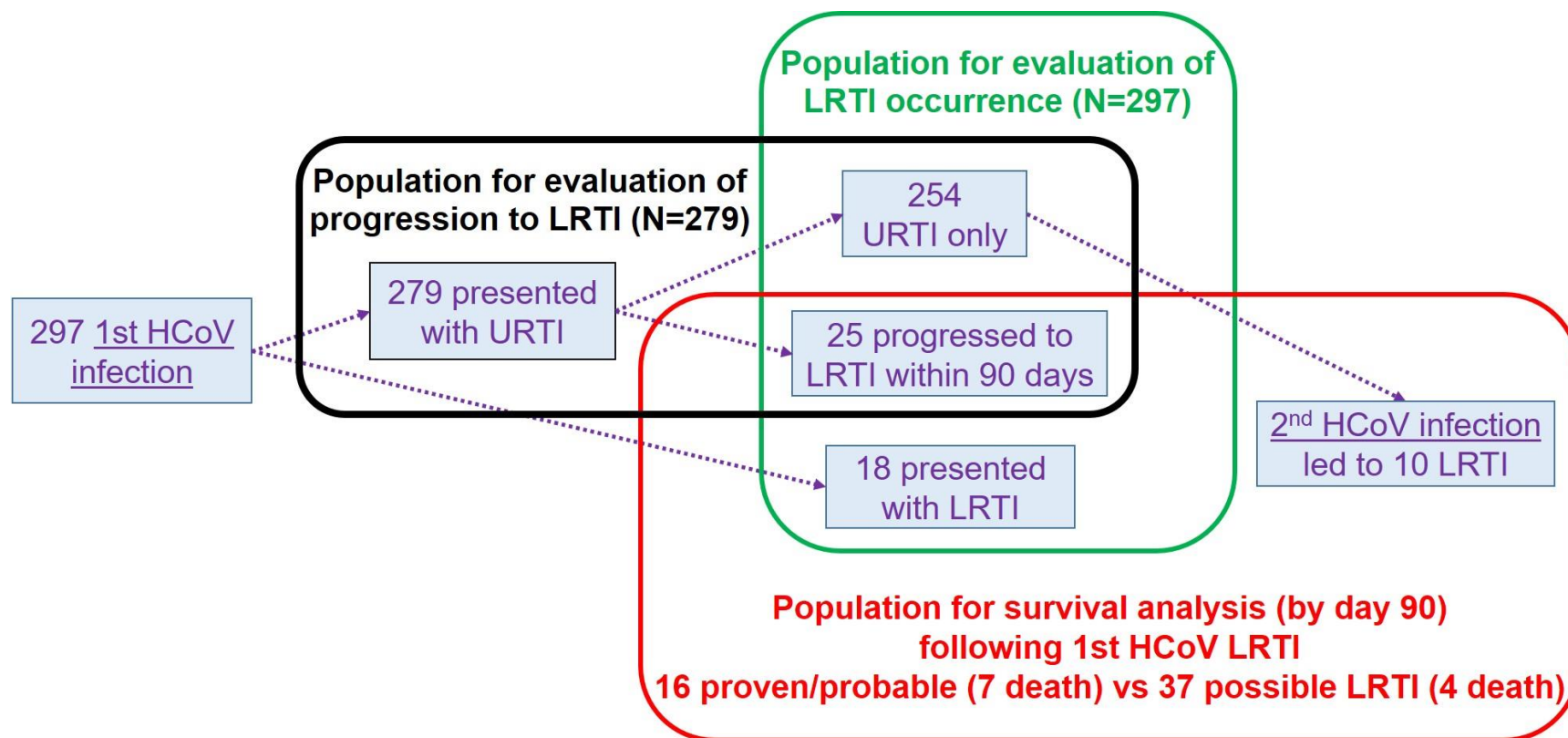
<sup>f</sup> highest daily steroid dose in the 2 weeks before HCoV diagnosis.

<sup>g</sup> using values within 2 weeks before HCoV diagnosis.

<sup>h</sup> highest HbA1c (%) within 3 months before HCoV diagnosis.

Abbreviations: URTI = upper respiratory tract infection, LRTI = lower respiratory tract infection, CI = confidence interval, PBSC = peripheral blood stem cell, CMV = cytomegalovirus, HCT = hematopoietic cell transplantation, GVHD = graft-versus-host disease, Ct = cycle threshold.

Supplementary Figure 1. Flow chart of study subjects for each outcome



Abbreviations: HCoV= human coronavirus, URTI = upper respiratory tract infection, LRTI = lower respiratory tract infection