Supplemental Table 1

COVID-19 patients

Groups	**HIV+/aTB-**	**HIV+/aTB+**
N	**23**	**8**
Age (median, IQR)	**47** [42-53]	**40** [33-54]
Male (%)	**43.5%**	**37.5%**
On ART (%, n)	**78.3%,** n=18	**62.5 %***, n=5
CD4 count (cells/mm^3, IQR)		
On ART	**264** [134-359]	**80** [32-184]
ART-naïve	**40** [8-120]	**106** [17-106]
Log_{10} Viral load (median, IQR)		
On ART	**<1.3** [<1.3-<1.3]	**3.5** [1.9-5]
ART-naïve	**4.4** [2.7-4.7]	**4.7** [4.2-5.3]

Supp Table 1. Clinical characteristics of HIV-infected and HIV/aTB co-infected COVID-19 participants. *: Despite reporting anti-retroviral treatment (ART) usage, it is most likely that most of the HIV+/aTB+ patients have defaulted treatment, with only one out of eight patients exhibiting an undetectable HIV-1 viral load with a CD4 count of 209 cells/mm^3.

Supplemental Table 2

	SURVIVED **70.5%** (n=67)	**DECEASED** **29.5%** (n=28)	***P-values***
Age (median, IQR)	**50** [42-56]	**55** [44-65]	**0.029**
Male (%, n)	**50.7%** (n=34)	**75%** (n=21)	**0.029**
HIV positive (%, n)	**37.3%** (n=25)	**21.4%** (n=6)	0.13
on ART	**72%** (n=18)	**83.3%** (n=5)	0.39
Time on ART (years, IQR)	**9.5** [6-12]	**10** [3.5-11]	0.75
CD4 count (cells/mm^3, IQR)	**144** [53-332]	**113** [45-270]	0.71
Log Viral load	**<1.3** [<1.3-3.75]	**2.38** [<1.3-4.91]	0.42
Active TB (%, n)	**13.4%** (n=9)	**21.4%** (n=6)	0.33
Co-morbidities (%, n)			
Cardiovascular	**7.5%** (n=5)	**7.1%** (n=2)	0.96
Hypertension	**43.3%** (n=29)	**53.6%** (n=15)	0.36
Diabetes	**34.3%** (n=23)	**46.4%** (n=13)	0.25
Obesity	**29.8%** (n=20)	**35.7%** (n=10)	0.57
Other respiratory diseases	**10.4%** (n=7)	**-**	**-**
SARS-CoV2 serology positive* (%, n)	**67.2%** (n=45)	**75%** (n=21)	0.45
COI (median, IQR)	**5.5** [0.25-23.3]	**15.5** [0.73-39.3]	0.057
WHO scale at enrolment (%, n)			
3	**25.4%** (n=17)	**-**	-
4	**43.3%** (n=29)	**10.7%** (n=3)	**0.002**
5	**22.4%** (n=15)	**46.4%** (n=13)	**0.019**
6	**8.9 %** (n=6)	**39.2%** (n=11)	**0.0004**
7	**-**	**3.6%** (n=1)	-
Severe: WHO ≥5 (%, n)	**31.3%** (n=21)	**89.3%** (n=25)	**<0.0001**
Cycle threshold value SARS PCR** (IQR)	**30.6** [24.8-33.9]	**29.1** [25.3-34.2]	0.83
CRP (mg/L, IQR, n)	**66** [31-136] (n=67)	**129** [58-222] (n=28)	**0.015**
D-dimer (µg/mL, IQR, n)	**0.54** [0.32-0.98] (n=63)	**0.85** [0.59-2.0] (n=27)	**0.015**
LDH (U/L)	**385** [313-513] (n=66)	**543** [387-689] (n=27)	**0.0009**
Ferritin (ng/mL, IQR, n)	**921** [512-1581] (n=96)	**1719** [1031-2279] (n=28)	**0.002**
White cell count (x10^9/L, IQR, n)	**8.9** [6.3-12.2] (n=67)	**11.9** [9.0-16.6] (n=28)	**0.005**
Unaffected lung (%, IQR, n)	**40%** [20-70] (n=59)	**20%** [0-40] (n=27)	**<0.0001**
On steroid treatment (%, n)	**73.1%** (n=49)	**92.9%** (n=26)	**0.032**
Days in hospital (%, IQR)	**11** [6-23]	**15** [7-22]	0.54

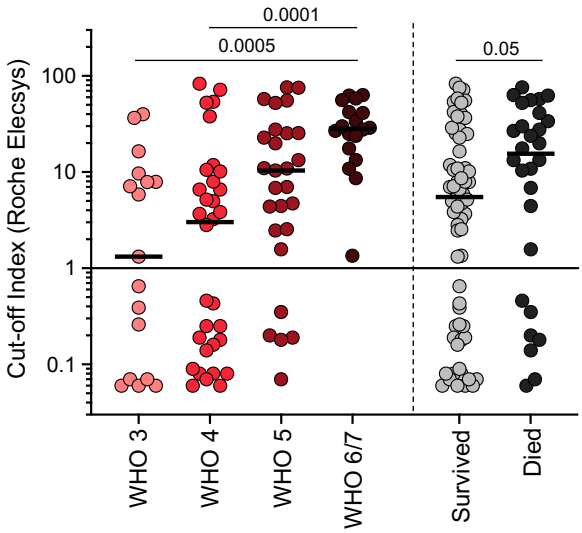
Supp Table 2. Clinical characteristics of COVID-19 patients who survived or died.
*: SARS-CoV-2 serology was performed using the Roche Elecsys assay, measuring SARS-CoV-2 nucleocapsid-specific antibodies. **: SARS-CoV-2 polymerase chain reaction (PCR) was performed using the Allplex™ 2019-nCoV Assay manufactured by Seegene.
Medians are reported and numbers in brackets correspond to interquartile range [IQR]. ART: antiretroviral treatment, COI: Cut-off index of Roche Elecsys assay, CRP: C-Reactive protein, LDH: lactate dehydrogenase.

Supplemental Table 3

Groups	HIV-/aTB-	HIV+/aTB-	HIV-/aTB+	HIV+/aTB+
N	**24**	**30**	**32**	**36**
Age (median, IQR)	**33** [28-43]	**34** [32-41]	**34** [32-42]	**37** [32-45]
Male (%)	**58.3%**	**23.3%**	**50%**	**66.7%**
CD4 count (cells/mm^3, IQR)	nd	**481** [358-700]	nd	**268** [141 - 400]
Log_{10} Viral load (median, IQR)	na	**<1.3** [<1.3-4.18]	na	**4.59** [2.19-5.00]
On ART (%)	na	**80.6 %**	na	**38.9%**

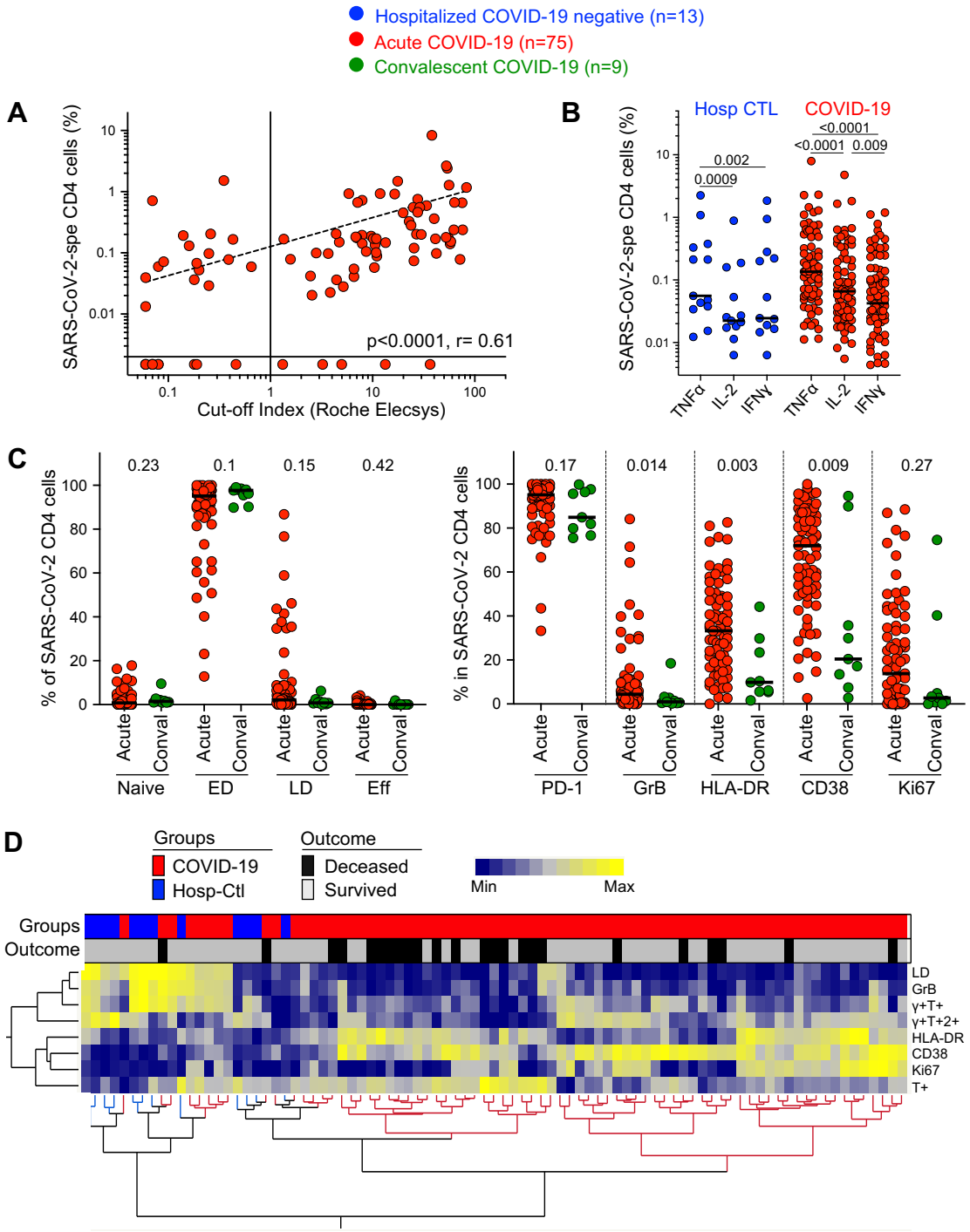
Supp Table 3. Clinical characteristics of 2018 case-control cohort.
ART: anti-retroviral treatment. nd: not done, na: not applicable.

Supplemental Figure 1



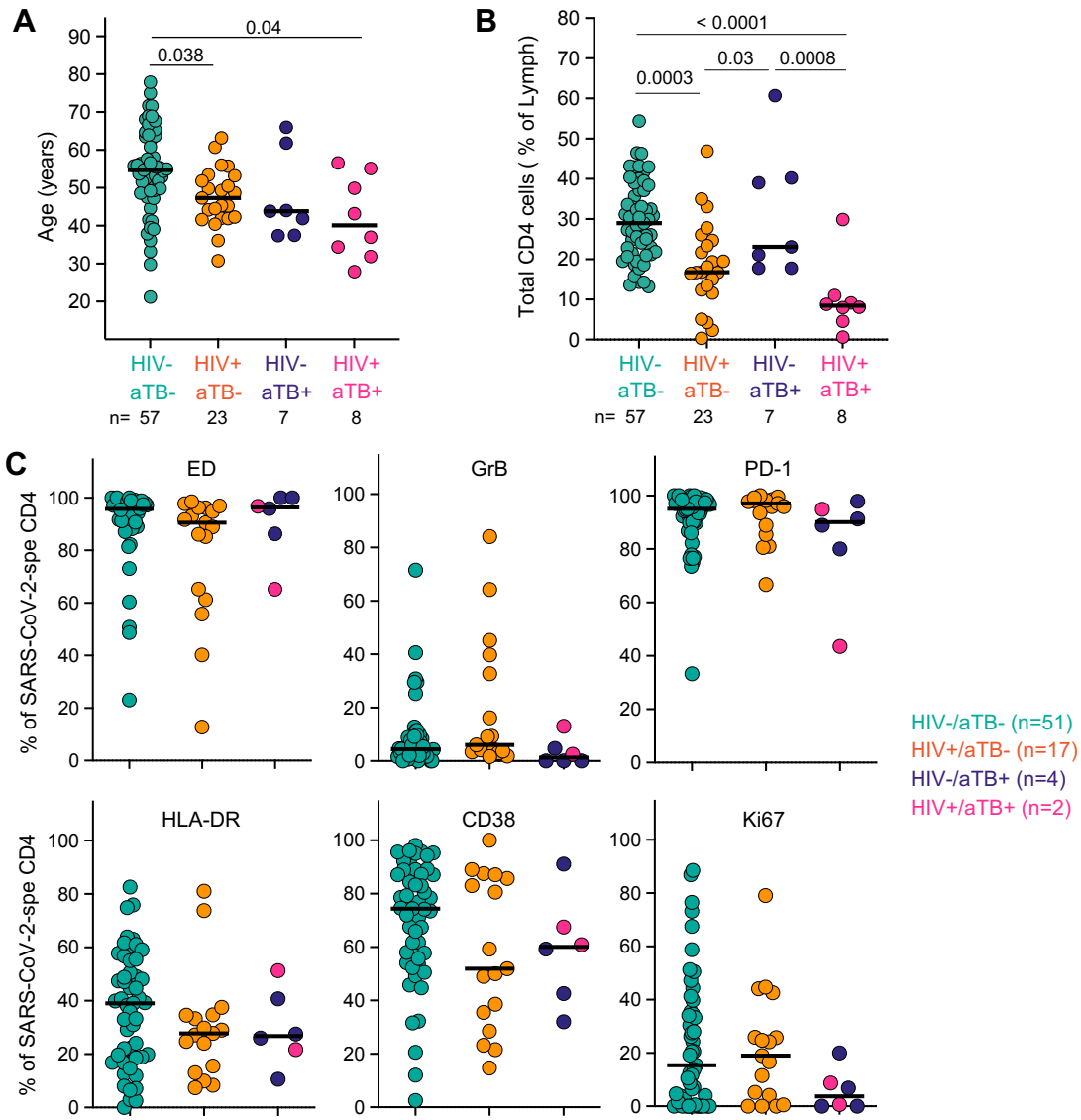
Supp Figure 1. **Magnitude of SARS-CoV-2-specific serological response** (defined using the Roche Elecsys® assay) in COVID-19 patients (n=94) stratified according to WHO ordinal score and outcome. Statistical comparisons were defined using a Kruskal-Wallis test, adjusted for multiple comparisons (Dunn's test) for the different WHO groups and the Mann-Whitney test to compare COVID-19 patients who survived or died. The plain horizontal line depicts the positivity cut-off as defined by manufacturer.

Supplemental Figure 2



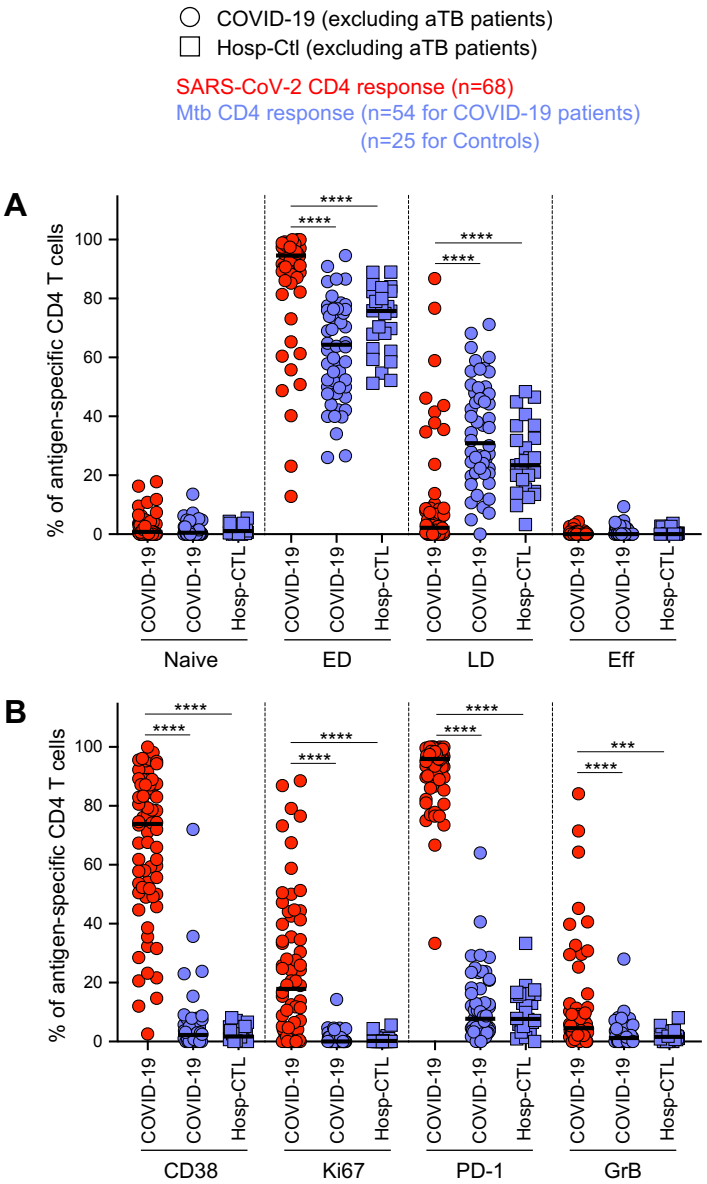
Supp Figure 2. **(A)** Association between the magnitude of SARS-CoV-2-specific serological response (defined using the Roche Elecsys® assay) and the frequency of SARS-CoV-2 CD4 T cells in COVID-19 patients. Correlation was tested by a two-tailed non-parametric Spearman rank test. **(B)** Comparison of frequency of IFNγ-, TNFα-, and IL2- in producing SARS-CoV-2-reactive CD4 T cells in acute COVID-19 cases (red) and hospitalized SARS-CoV-2-uninfected patients (blue). Only SARS-CoV-2 responders are depicted. **(C)** Comparison of the memory (left) and activation (right) profile of SARS-CoV-2-specific CD4 T cells between acute COVID-19 cases (red) and convalescent patients (green). Statistical comparisons were calculated using the non-parametric Mann-Whitney test. **(D)** Non-supervised two-way hierarchical cluster analysis (Ward method) of eight functional or phenotypic attributes of SARS-CoV-2-specific CD4 T cells (the proportion of IFNγ+TNFα+IL2+, IFNγ-TNFα+IL2+ IFNγ-TNFα+IL2- and cells, the proportion of ED, and GrB, HLA-DR, CD38 and Ki67 expression). COVID-19 status and outcome for each patient is indicated at the top of the dendrogram.

Supplemental Figure 3



Supp Figure 3. **Clinical characteristics and phenotype of SARS-CoV-2-specific CD4 T cells in COVID-19 patients, grouped according to their HIV and TB status. (A)** Comparison of the age of COVID-19 patients based on their HIV and TB status. **(B)** Comparison of the frequency of total CD4 T cells based on patient's' HIV and TB status. Statistical comparisons were performed using a Kruskal-Wallis test, adjusted for multiple comparisons (Dunn's test). **(C)** Memory and activation profile of SARS-CoV-2-specific CD4 T cells in COVID-19 cases, stratified by HIV and/or aTB co-infection. ED: Early differentiated (CD45RA-CD27+). The phenotype of SARS-CoV-2-specific CD4 T cells was assessed only on response with at least 20 events.

Supplemental Figure 4



Supp Figure 4. Comparison of the memory differentiation (A) and activation (B) profile of SARS-CoV-2- and Mtb-specific CD4 T cells in hospitalized COVID-19 and non-COVID-19 patients. Statistical comparisons were performed using a Kruskal-Wallis test, adjusted for multiple comparisons (Dunn's test). ****: $p < 0.0001$, ***: $p = 0.0001$. Naïve (CD45RA+CD27+), ED: early differentiated (CD45RA-CD27+), LD: late differentiated (CD45RA-CD27-), Eff: Effector (CD45RA+CD27-).

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