**Supplemental Table 1.** Patient characteristics, ventilation, ECMO parameters and outcome

|                                | Covid-19  | non-Covid-19 | p value |
|--------------------------------|-----------|--------------|---------|
| patients; no                   | 16        | 23           |         |
| median age (IQR); years        | 61 (53 – 65) | 54 (36 – 63) | 0.06   |
| male; no. (%)                  | 14 (88)   | 16 (70)      | 0.26   |
| median BMI (IQR)               | 30 (21 – 35) | 25 (22 – 29) | 0.16   |
| median SOFA (IQR)*             | 13 (11 – 14) | 11 (9 – 13)  | 0.7    |
| **coexisting conditions**      |           |              |         |
| pulmonary disease; no. (%)     | 5 (31)    | 8 (35)       | >0.99  |
| cardiac disease; no. (%)       | 5 (31)    | 4 (17)       | 0.44   |
| chronic kidney disease; no. (%)| 1 (6)     | 1 (4)        | >0.99  |
| diabetis; no. (%)              | 5 (31)    | 3 (13)       | 0.22   |
| malignant disease; no. (%)     | 4 (24)    | 3 (13)       | 0.42   |
| **cause of ARDS**              |           |              |         |
| bacterial pneumonia; no (%)    |           | 14 (61)      |         |
| viral pneumonia; no. (%)       | 16 (100)  | 1 (4)        | NA     |
| fungal pneumonia; no. (%)      |           | 4 (17)       |         |
| extrapulmonary sepsis; no. (%) |           | 1 (4)        |         |
| trauma; no (%)                 |           | 1 (4)        |         |
| **ventilator settings and gas exchange before ECMO** | | | |
| median ventilator days before ECMO (IQR); days | 8 (3 – 12) | 6 (2 – 10) | 0.41 |
| median Ppeak (IQR); mbar       | 35 (32 – 39) | 28 (27 – 35) | 0.06 |
| median PEEP (IQR); mbar        | 17 (14 – 19) | 16 (12 – 18) | 0.31 |
| median respirator frequency (IQR); breaths per min | 25 (24 – 28) | 22 (18 – 24) | 0.02 |
| median tidal volume (IQR); ml/kg PPW | 5 (6 – 7) | 5 (4 – 7) | 0.13 |
| NO inhalation; no. (%)         | 8 (50)    | 7 (30)       | 0.32   |
| prone position; no. (%)        | 10 (63)   | 8 (35)       | 0.11   |
| dexamethasone; no. (%)         | 11 (69)   | NA           | NA     |
| $\text{P}_2\text{O}_2/$$F_2\text{O}_2$ (IQR); mmHg | 93 (64 – 110) | 71 (61 – 128) | 0.7   |
| Parameter                                    | Value 1 (IQR)         | Value 2 (IQR)         | p-value |
|----------------------------------------------|-----------------------|-----------------------|---------|
| $\text{P}_a\text{CO}_2$ (IQR); mmHg         | 69 (60–80)            | 62 (51–73)            | 0.16    |
| arterial pH (IQR)                            | 7.27 (7.21–7.3)       | 7.28 (7.19–7.34)      | 0.79    |
| **initial ECMO setting**                     |                       |                       |         |
| median ECMO blood flow (IQR); L/min          | 3.8 (3.1–4.0)         | 3.9 (3.4–4.4)         | 0.14    |
| median ECMO gas flow (IQR); L/min            | 4 (3–6)               | 3 (2.5–5)             | 0.12    |
| **survival and days on ECMO**                |                       |                       |         |
| ICU survival; no. (%)                        | 10 (62)               | 16 (70)               | 0.74    |
| median days on ECMO all patients (IQR)       | 36 (18–58)            | 19 (13–44)            | 0.18    |
| median days on ECMO of survivors (IQR)       | 43 (18–58)            | 16 (9–39)             | 0.03    |
| median days on ECMO of dead (IQR)            | 23 (15–62)            | 39 (25–72)            | 0.31    |
| **outcome of patients discharged alive**     |                       |                       |         |
| tracheostomy; no. (%)                        | 10 (100)              | 13 (81)               | 0.26    |
| RRT; no. (%)                                 | 2 (10)                | 6 (38)                | 0.42    |
| invasive ventilation; no (%)                 | 7 (70)                | 11 (69)               |         |
| non-invasive ventilation/oxygen insufflation; no (%) | 3 (30)              | 5 (31)                | 0.99    |
| bed; no (%)                                  | 1 (10)                | 4 (25)                |         |
| sitting; no (%)                              | 4 (40)                | 5 (31)                | 0.66    |
| standing; no (%)                             | 1 (10)                | 3 (19)                |         |
| walking; no (%)                              | 4 (10)                | 4 (25)                |         |
| **fibrotic pulmonary lesions**               |                       |                       |         |
| fibrosis all; no (%)                         | 12 of 16 (75)         | 7 of 21 (33)          | 0.02    |
| fibrosis survivors; no. (%)                  | 7 of 10 (70)          | 1 of 15 (7)           | < 0.01  |
| fibrosis dead; no. (%)                       | 5 of 6 (83)           | 6 of 6 (100)          | >0.99   |

Definition of abbreviations: no = number; IQR = interquartile range; BMI = body mass index; SOFA = Sequential Organ Failure Assessment score; ECMO = Extracorporeal Membrane Oxygenation; $P_{\text{peak}}$ = peak inspiratory pressure, PEEP = positive end-expiratory pressure; NO = nitric oxide; $P_{a\text{O}_2}$ = arterial partial pressure of oxygen; $P_{a\text{CO}_2}$ = arterial partial pressure of carbon dioxide; RRT = renal replacement therapy; NA = not applicable. Data are presented as number and percent or median and interquartile range.

Fibrotic pulmonary lesions include the radiological diagnosis of respective lesion in the pulmonary computer tomography of the patient.

*SOFA score was calculated at ICU admission at the ARDS ECMO center.

†ICEMO settings at the first measurements of included patients.

# Outcome parameters at time point of discharge from the ECMO ARDS center to a weaning or rehabilitation center.
Two non-Covid-19 patients, who suffered from cystic fibrosis (CF), were excluded from the investigation for radiological signs of fibrotic pulmonary lesions.