

**Supplementary Table 1. Bacteria isolated from the respiratory specimens of patients with influenza-related ARDS having NLRTI**

Pathogen	No.
<i>Acinetobacter baumannii</i>	29 (26.6%) (96.6% CRAB)
<i>Stenotrophomonas maltophilia</i>	16 (14.7%)
<i>Burkholderia cepacia</i>	12 (11.0%)
<i>Staphylococcus aureus</i>	10 (9.2%) (100% MRSA)
<i>Pseudomonas aeruginosa</i>	5 (4.6%) (40% CRPA)
<i>Klebsiella pneumoniae</i>	4 (3.7%) (100% CRKP)
<i>Serratia marcescens</i>	4 (3.7%)
<i>Chryseobacterium indologenes</i>	4 (3.7%)
<i>Enterobacter</i> sp.	3 (2.8%)
Others	22 (20.0%)

ARDS: acute respiratory distress syndrome; CRAB: carbapenem-resistant *Acinetobacter baumannii*; CRKP: carbapenem-resistant *Klebsiella pneumoniae*; CRPA: carbapenem-resistant *Pseudomonas aeruginosa*; MRSA: methicillin-resistant *Staphylococcus aureus*; NLRTI: nosocomial lower respiratory tract infection.

**Supplementary Table 2. Characteristics of the 250 subjects with influenza-related ARDS categorized according to in-hospital mortality**

	<b>Survivor (n = 165)</b>	<b>Non-survivor (n = 85)</b>	<b>P value</b>
<b>Baseline data</b>			
Age (years)	59.0 ± 14.2	60.3 ± 14.9	0.520
Male (%)	104 (63.0%)	53 (62.4%)	0.916
Body mass index (kg/m <sup>2</sup> )	25.5 ± 5.6	24.8 ± 5.3	0.316
Malignancy	14 (8.5%)	18 (21.2%)	0.004
Type II diabetes mellitus	45 (27.3%)	28 (32.9%)	0.350
Liver cirrhosis	14 (8.5%)	18 (21.2%)	0.004
Cerebrovascular disease	12 (7.3%)	8 (9.4%)	0.696
End-stage renal disease	11 (6.7%)	4 (4.7%)	0.536
Congestive heart failure	16 (9.7%)	8 (9.4%)	0.942
Immunosuppressant use before influenza infection <sup>a</sup>	6 (3.6%)	8 (9.4%)	0.080
<b>Subtypes of influenza</b>			
Type A (%)	137 (83.0%)	61 (71.8%)	0.065
Type B (%)	9 (5.5%)	11 (12.9%)	
Positive, unknown subtype (%)	19 (11.5%)	13 (15.3%)	
<b>Laboratory data</b>			
Albumin (mg/dL)	2.9 ± 0.5	2.7 ± 0.7	0.011
Serum C-reactive protein (mg/dL)	14.8 ± 10.2	16.6 ± 10.3	0.210
Serum lactate level (mg/dL)	23.2 ± 23.9	41.5 ± 51.6	0.004
<b>Severity scores</b>			
APACHE II	21.5 ± 7.6	27.7 ± 8.6	<0.001
SOFA score			
Day 1	9.5 ± 3.8	12.5 ± 3.7	<0.001
Day 3	8.5 ± 3.7	12.6 ± 4.2	<0.001
Day 7	6.9 ± 3.4	11.8 ± 4.2	<0.001
PaO <sub>2</sub> /FiO <sub>2</sub>	114.0 ± 66.8	91.1 ± 50.3	0.003
ARDS <sup>b</sup>			0.026
Mild	23 (13.9%)	4 (4.7%)	
Moderate to severe (%)	142 (86.1%)	81 (95.3%)	

**Management**

ECMO <sup>c</sup> (%)	16 (9.7%)	31 (36.5%)	<0.001
Prone position <sup>c</sup> (%)	37 (22.4%)	21 (24.7%)	0.686
Renal replacement therapy <sup>c,d</sup> (%)	11 (6.7%)	19 (22.4%)	<0.001
Vasopressor <sup>c</sup> (%)	72 (43.6%)	62 (72.9%)	<0.001
Sedation <sup>c</sup> (%)	118 (71.5%)	67 (78.8%)	0.212
Neuromuscular blockade <sup>c</sup> (%)	93 (56.4%)	62 (72.9%)	0.011
Steroid use <sup>c</sup> (%)	100 (60.6%)	59 (69.4%)	0.17
Mean steroid dosage <sup>c</sup> (mg/kg/day) <sup>e</sup>	1.2 ± 2.1	1.1 ± 1.6	0.787
NLRTI	38 (23.0%)	34 (40.0%)	0.005

<sup>a</sup> Oral prednisolone equivalent dosage > 5 mg/day or >150 mg cumulative dose within 1 month before influenza infection; or regular treatment using other immunosuppressants within 1 month before influenza infection. <sup>b</sup> In accordance with the Berlin definition. <sup>c</sup> In our cohorts, 20 (95.2%) out of 21 patients with NLRTI received ECMO before development of NLRTI. Other managements, including prone position, renal replacement therapy, vasopressors, sedatives, neuromuscular blockade, and steroid were all initiated before NLRTI. <sup>d</sup> Excluding those with end-stage renal disease receiving regular hemodialysis. <sup>e</sup> In NLRTI group, mean steroid dosage was calculated only before NLRTI. In patients without NLRTI, mean steroid dosage was calculated from steroid cumulative dosage for 14 days via prednisolone equivalent dose (mg) after ARDS. Data are presented as mean ± standard deviation and number (%). ARDS: acute respiratory distress syndrome; APACHE II: Acute Physiology and Chronic Health Evaluation; ECMO: extracorporeal membrane oxygenation; FiO<sub>2</sub>: fraction of inspired oxygen; ICU: intensive care unit; NLRTI: nosocomial lower respiratory tract infection; PaO<sub>2</sub>: arterial partial pressure of oxygen; SOFA: Sequential Organ Failure Assessment.

**Supplementary Table 3. Independent factors associated with in-hospital mortality according to multivariate logistic regression analyses**

	Odds ratio	95% Confidence interval	P value
Liver cirrhosis	81.616	3.439-1937.07	0.006
APACHE II	1.194	1.004-1.42	0.045
SOFA score Day 7	2.171	1.371-3.438	0.001
ECMO use	25.969	1.609-419.238	0.022
NLRTI	9.228	1.172-72.622	0.035