

Re-exacerbation within 30 days of discharge is associated with poor prognosis in the following year among patients hospitalised with exacerbation of chronic obstructive pulmonary disease: a clinical cohort study

Supplementary Table S1. Characteristics at the 30th day of the study participants

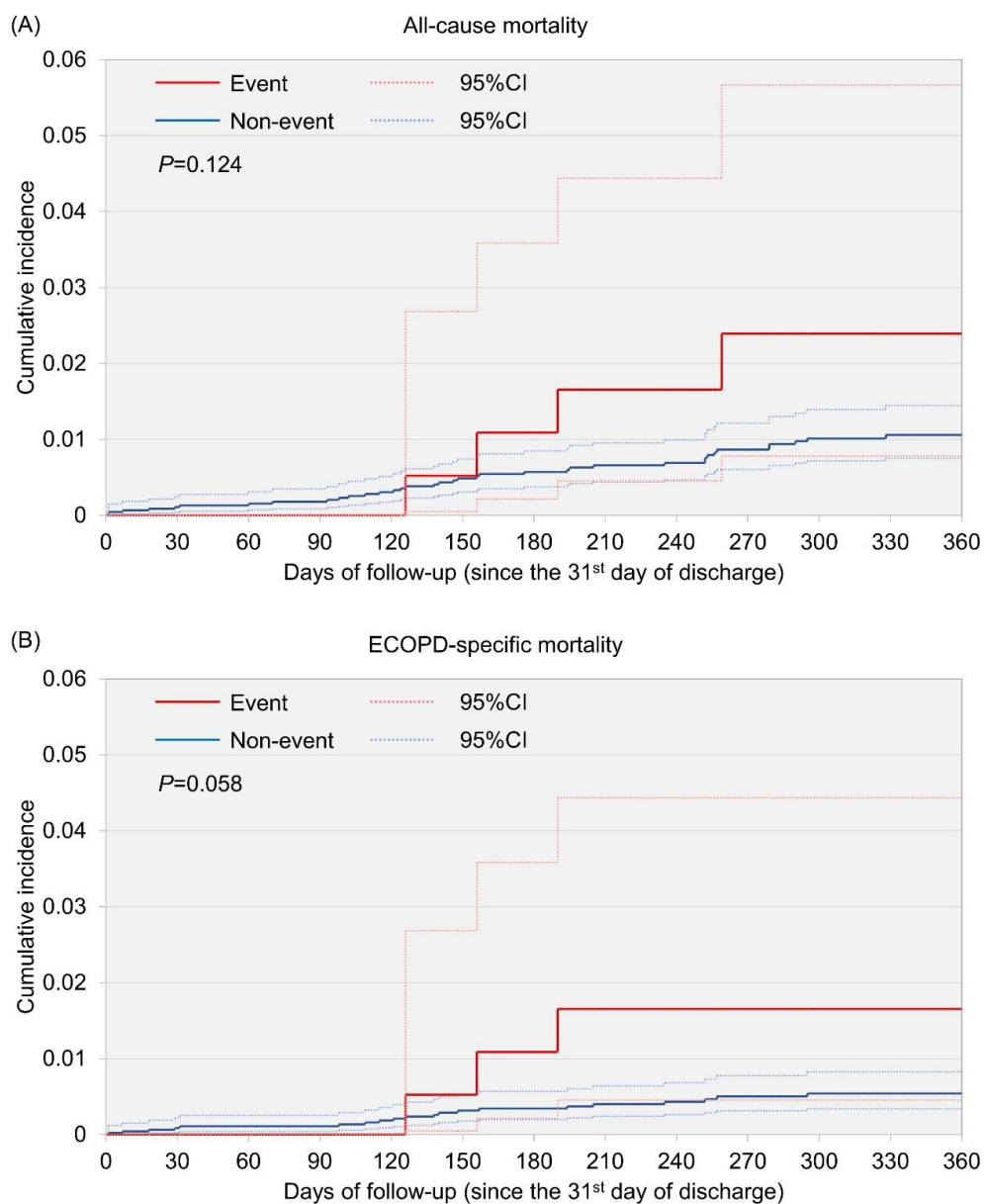
| Characteristics | Total (N=4963) | Event (N=242) | Non-event (N=4721) | P value |
|--|-------------------|------------------|-----------------------|---------|
| mMRC, n (%) | | | | <0.001 |
| <2 | 2697 (54.34) | 54 (22.31) | 2643 (55.98) | |
| ≥2 | 2266 (45.66) | 188 (77.69) | 2078 (44.02) | |
| CAT score, n (%) | | | | <0.001 |
| <10 | 1708 (34.41) | 19 (7.85) | 1689 (35.78) | |
| ≥10 | 3255 (65.59) | 223 (92.15) | 3032 (64.22) | |
| Pharmacological therapy, n (%) | | | | |
| LAMA+LABA+ICS | 820 (16.52) | 51 (21.07) | 769 (16.29) | 0.051 |
| Non-pharmacological therapy, n (%) | | | | |
| Home oxygen therapy | 1112 (22.41) | 92 (38.02) | 1020 (21.61) | <0.001 |
| Pulmonary rehabilitation | 1109 (22.35) | 44 (18.18) | 1065 (22.56) | 0.111 |
| Smoking cessation | 1278 (25.75) | 65 (26.86) | 1213 (25.69) | 0.686 |
| Days since discharge to event, median (quartile) | - | 19 (10, 25) | - | - |
| Severe exacerbation, n (%) | - | 116 (47.93) | - | - |

Event: re-exacerbation within 30 days of discharge; Non-event: no re-exacerbation within 30 days of discharge; mMRC: modified British Medical Research Council; CAT: COPD Assessment Test; LAMA: Long-acting muscarinic antagonists; LABA: Long-acting beta₂-agonists; ICS: Inhaled corticosteroids.

Supplementary Table S2. Stratified analysis of the association between re-event within 30 days after discharge with the risk of exacerbation, severe exacerbation, and all-cause readmission during the following one year

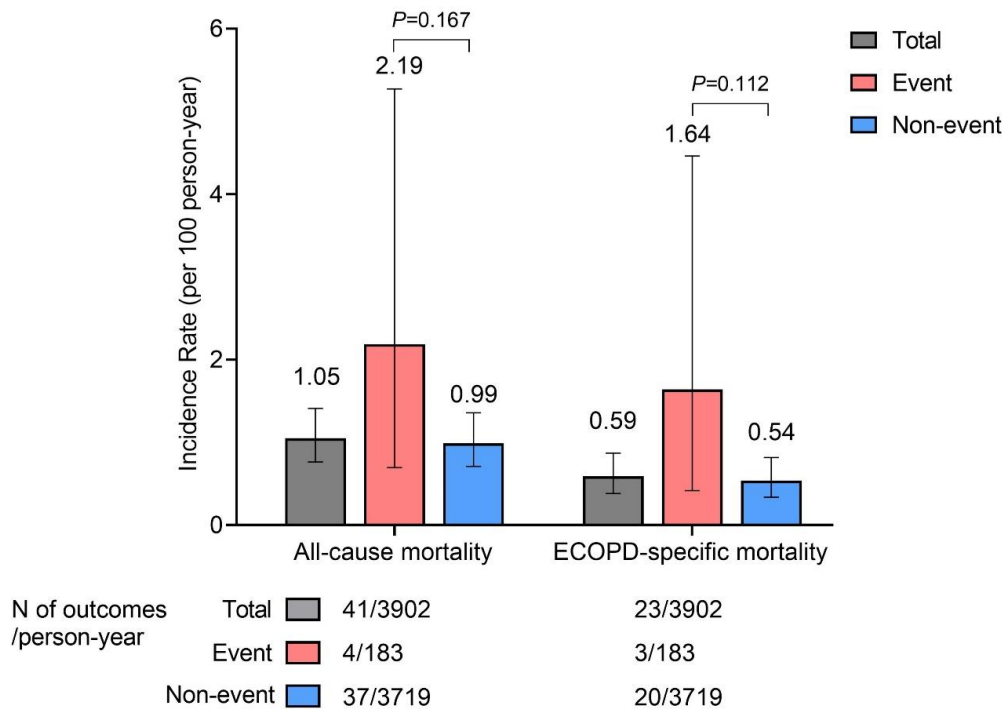
| Stratification | Exacerbation | | Severe exacerbation | | All-cause readmission | |
|---|-------------------|-------------------|---------------------|-------------------|-----------------------|-------------------|
| | HR (95%CI) | P for interaction | HR (95%CI) | P for interaction | HR (95%CI) | P for interaction |
| Age, years | | | | | | |
| <70 | 3.95 (2.93, 5.33) | | 3.14 (2.17, 4.56) | | 2.94 (2.02, 4.27) | |
| ≥70 | 3.90 (2.80, 5.43) | 0.865 | 3.87 (2.65, 5.65) | 0.599 | 3.69 (2.55, 5.34) | 0.572 |
| BMI, kg/m ² | | | | | | |
| <18.5 | 2.54 (1.53, 4.22) | | 2.53 (1.41, 4.53) | | 2.43 (1.36, 4.34) | |
| ≥18.5 | 4.25 (3.32, 5.43) | 0.074 | 3.69 (2.74, 4.97) | 0.460 | 3.48 (2.59, 4.68) | 0.505 |
| Smoke | | | | | | |
| never or former | 3.90 (3.08, 4.92) | | 3.30 (2.48, 4.38) | | 3.19 (2.42, 4.22) | |
| current | 3.86 (1.98, 7.54) | 0.528 | 5.68 (2.76, 11.67) | 0.280 | 4.53 (2.14, 9.59) | 0.652 |
| Education | | | | | | |
| primary school and below | 3.76 (2.81, 5.04) | | 3.10 (2.14, 4.48) | | 2.70 (1.85, 3.94) | |
| junior high school and above | 4.05 (2.88, 5.69) | 0.708 | 3.83 (2.62, 5.60) | 0.512 | 4.00 (2.76, 5.79) | 0.195 |
| Severe exacerbation in the past year | | | | | | |
| no | 5.27 (3.58, 7.77) | | 3.21 (1.86, 5.55) | | 2.77 (1.62, 4.75) | |
| yes | 3.48 (2.65, 4.56) | 0.089 | 3.63 (2.68, 4.91) | 0.864 | 3.53 (2.61, 4.77) | 0.588 |
| Ever home oxygen therapy | | | | | | |
| no | 4.40 (3.43, 5.64) | | 4.05 (3.00, 5.47) | | 3.75 (2.78, 5.05) | |
| yes | 2.87 (1.75, 4.72) | 0.041 | 2.19 (1.24, 3.87) | 0.014 | 2.14 (1.21, 3.78) | 0.026 |
| Ever regular inhaled corticosteroid treatment (≥3 months) | | | | | | |

| | | | | | | |
|---|--------------------|-------|--------------------|-------|--------------------|--------------|
| no | 4.16 (3.20, 5.42) | | 3.31 (2.34, 4.67) | | 3.04 (2.16, 4.28) | |
| yes | 3.25 (2.16, 4.87) | 0.389 | 3.85 (2.53, 5.85) | 0.743 | 3.85 (2.53, 5.85) | 0.445 |
| CAT score at admission | | | | | | |
| <20 | 3.48 (2.31, 5.23) | | 2.42 (1.45, 4.02) | | 2.15 (1.30, 3.56) | |
| ≥20 | 4.09 (3.13, 5.33) | 0.303 | 4.09 (2.99, 5.61) | 0.062 | 3.97 (2.90, 5.43) | 0.031 |
| Chronic cor pulmonale | | | | | | |
| no | 3.73 (2.81, 4.94) | | 3.12 (2.20, 4.43) | | 2.94 (2.08, 4.16) | |
| yes | 4.25 (2.96, 6.10) | 0.728 | 4.22 (2.79, 6.39) | 0.389 | 4.26 (2.82, 6.44) | 0.344 |
| Chronic heart failure | | | | | | |
| no | 3.79 (3.00, 4.79) | | 3.29 (2.48, 4.36) | | 3.13 (2.37, 4.13) | |
| yes | 4.92 (2.40, 10.06) | 0.741 | 5.35 (2.3, 12.43) | 0.313 | 4.63 (2.01, 10.65) | 0.321 |
| Treatment with methylxanthines during hospitalization | | | | | | |
| no | 5.22 (3.14, 8.68) | | 5.08 (2.38, 10.85) | | 4.55 (2.14, 9.68) | |
| yes | 3.69 (2.88, 4.72) | 0.355 | 3.35 (2.52, 4.44) | 0.385 | 3.21 (2.43, 4.26) | 0.532 |



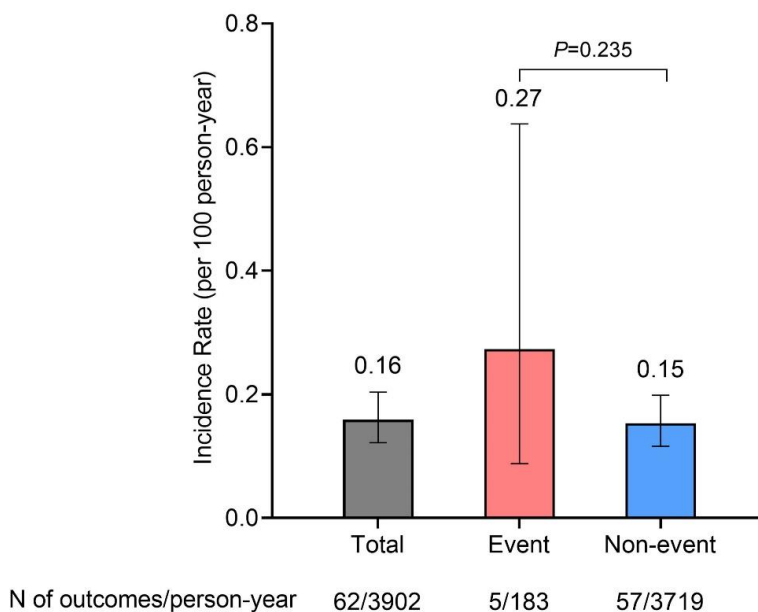
Supplementary Figure S1. Cumulative incidence of (A) all-cause mortality and (B) ECOPD-specific mortality during the one-year follow-up since the 31st day of discharge.

Event, re-exacerbation within 30 days of discharge; Non-event, no re-exacerbation within 30 days of discharge; CI: confidence interval.



Supplementary Figure S2. Incidence density of all-cause mortality and ECOPD-specific mortality during the one-year follow-up since the 31st day after discharge.

Event: re-exacerbation within 30 days of discharge; Non-event: no re-exacerbation within 30 days of discharge.



Supplementary Figure S3. Incidence density of cardiovascular events during the one-year follow-up since the 31st day after discharge.

Event: re-exacerbation within 30 days of discharge; Non-event: no re-exacerbation within 30 days of discharge.

Supplementary Table S3. Risk factors for exacerbation, severe exacerbation, and all-cause readmission during the 1-year follow-up after discharge.

| Variable | Exacerbation | | Severe exacerbation | | All-cause readmission | |
|---|-------------------|------------------|---------------------|------------------|-----------------------|------------------|
| | HR (95%CI) | <i>P</i> | HR (95%CI) | <i>P</i> | HR (95%CI) | <i>P</i> |
| Event within 30 days | 3.65 (2.82, 4.72) | <0.001 | 2.91 (2.12, 3.99) | <0.001 | 2.77 (2.02, 3.78) | <0.001 |
| Chronic heart failure | 1.45 (1.05, 2.01) | 0.026 | 0.97 (0.86, 1.08) | 0.551 | 1.01 (0.91, 1.13) | 0.814 |
| Ever regular inhaled corticosteroid treatment | 1.38 (1.13, 1.70) | 0.002 | 0.77 (0.67, 0.88) | <0.001 | 0.79 (0.69, 0.89) | <0.001 |
| Treatment with methylxanthine | 1.29 (1.05, 1.58) | 0.018 | 0.87 (0.69, 1.08) | 0.201 | 0.90 (0.73, 1.11) | 0.330 |
| Treatment with antibiotic | 1.27 (0.92, 1.77) | 0.148 | 0.63 (0.47, 0.84) | 0.002 | 0.67 (0.51, 0.89) | 0.005 |
| Ever home oxygen treatment | 1.25 (0.99, 1.58) | 0.063 | 0.72 (0.57, 0.91) | 0.006 | 0.77 (0.62, 0.96) | 0.018 |
| CAT score at admission (per 10 scores) | 1.22 (1.09, 1.38) | 0.001 | 0.74 (0.56, 0.98) | 0.038 | 0.74 (0.57, 0.97) | 0.027 |
| Chronic cor pulmonale | 1.17 (0.94, 1.46) | 0.152 | 1.16 (0.93, 1.45) | 0.192 | 1.11 (0.90, 1.37) | 0.340 |
| Sever exacerbation in the past year | 1.16 (0.95, 1.40) | 0.142 | 1.61 (1.25, 2.06) | <0.001 | 1.60 (1.26, 2.03) | <0.001 |
| Treatment with systemic corticosteroids | 1.13 (0.94, 1.36) | 0.205 | 1.61 (1.28, 2.01) | <0.001 | 1.53 (1.23, 1.90) | <0.001 |
| GOLD stage | 1.04 (0.94, 1.16) | 0.427 | 1.12 (0.98, 1.28) | 0.108 | 1.11 (0.97, 1.26) | 0.127 |
| Smoke (vs. Never smoker) | | | | | | |
| Ex-smoker | 1.04 (0.85, 1.27) | 0.740 | 0.93 (0.75, 1.16) | 0.527 | 0.97 (0.79, 1.20) | 0.799 |
| Current smoker | 0.78 (0.61, 1.00) | 0.051 | 1.32 (0.90, 1.92) | 0.152 | 1.03 (0.74, 1.43) | 0.867 |
| Respiratory failure | 0.98 (0.80, 1.21) | 0.862 | 0.82 (0.65, 1.04) | 0.108 | 0.89 (0.71, 1.11) | 0.295 |
| Age (per 10 years) | 0.90 (0.81, 0.99) | 0.036 | 1.28 (1.00, 1.62) | 0.047 | 1.28 (1.02, 1.61) | 0.036 |
| Pneumonia | 0.86 (0.71, 1.05) | 0.127 | 1.33 (0.91, 1.95) | 0.135 | 1.25 (0.87, 1.80) | 0.233 |
| BMI (kg/m ² , per category) | 0.82 (0.73, 0.92) | 0.001 | 1.57 (1.23, 2.01) | <0.001 | 1.57 (1.24, 1.98) | <0.001 |
| Education (vs. Primary school and below) | | | | | | |
| Junior high school | 0.69 (0.56, 0.85) | 0.001 | 1.14 (1.01, 1.29) | 0.033 | 1.07 (0.95, 1.20) | 0.258 |
| Senior high school and above | 0.82 (0.65, 1.04) | 0.107 | 1.09 (0.89, 1.35) | 0.399 | 1.09 (0.89, 1.33) | 0.395 |

Event: re-exacerbation within 30 days of discharge; CAT: COPD Assessment Test; GOLD: Global Initiative for Chronic Obstructive Lung Disease; BMI: body mass index; HR: hazard ratio; CI: confidence interval.