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**Long-term natural history
of chronic obstructive pulmonary disease:
severe exacerbations and mortality**

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Background The long-term natural history of chronic obstructive pulmonary disease (COPD) in terms of successive severe exacerbations and mortality is unknown.

Methods The authors formed an inception cohort of patients from their first ever hospitalisation for COPD during 1990–2005, using the healthcare databases from the province of Quebec, Canada. Patients were followed until death or 31 March 2007, and all COPD hospitalisations occurring during follow-up were identified. The hazard functions of successive hospitalised COPD exacerbations and all-cause mortality over time were estimated, and HRs adjusted for age, sex, calendar time and comorbidity.

Results The cohort included 73 106 patients hospitalised for the first time for COPD, of whom 50 580 died during the 17-year follow-up, with 50% and 75% mortality at 3.6 and 7.7 years respectively. The median time from the first to the second hospitalised exacerbation was around 5 years and decreased to <4 months from the 9th to the 10th. The risk of the subsequent severe exacerbation was increased threefold after the second severe exacerbation and 24-fold after the 10th, relative to the first. Mortality after a severe exacerbation peaked to 40 deaths per 10 000 per day in the first week after admission, dropping gradually to 5 after 3 months.

Conclusions The course of COPD involves a rapid decline in health status after the second severe exacerbation and high mortality in the weeks following every severe exacerbation. Two strategic targets for COPD management should include delaying the second severe exacerbation and improving treatment of severe exacerbations to reduce their excessive early mortality.