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Title: Non-invasive ventilation (NIV) and mortality in patients with a first-time admission for a COPD exacerbation: A nationwide study

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Body: Objective: DrCOPD - a nationwide chronic obstructive pulmonary disease (COPD) quality improvement program was initiated in Denmark in 2008. We examined subsequent national and regional trends in use of non invasive ventilation (NIV) and trends in mortality following NIV and mechanical ventilation among patients acutely admitted with a COPD exacerbation. Methods: We did a nationwide, population-based prospective study using DrCOPD to identify all incident hospitalizations with COPD from 2008 through 2011 (n=24,982) and use of NIV during hospitalization. Date of death was retrieved from the Danish Civil Registration System. Results: During follow-up, use of NIV treatment in patients with first-time COPD hospitalization increased in all five Danish regions. Nationally, use of NIV increased from 5.8% to 7.0% (age-, sex- and comorbidity adjusted RR 1.21, 95% CI 1.05; 1.38). Concurrently, NIV given together with mechanical ventilation increased from 1.3% to 1.8% (RR 1.36, 95% CI 1.03; 1.80). During the four years of follow-up, mortality remained stable, with some regional variation. In-hospital mortality following NIV was also stable over time, while mortality decreased slightly in patients treated with both NIV and mechanical ventilation. Conclusion: Use of NIV in Denmark increased after the launch of a national COPD quality program in 2008. However, regional variation remains and no substantial improvements in mortality have been observed. Continued efforts are warranted to ensure appropriate implementation of NIV.