Title: COPD admissions and inhaled medications: Escalating prescription costs but no evidence of effect. A national primary care study

Body: Objective: To investigate the impact of rising primary care prescribing of inhaled long-acting anti-muscarinic (LAMA) and combined inhaled long-acting beta-agonist and corticosteroid (LABA+ICS) drugs on COPD admissions. Design: Retrospective analysis of COPD admission and prescribing data routinely collected between 2001 and 2010. Setting: Representative group of 806 English general practices (population 5,264,506). Participants: Patients admitted to hospital with a COPD exacerbation (2001 – 2010). Main outcome measures: Rates of COPD patient admissions and prescription costs of LAMA and LABA+ICS for each practice. General practice characteristics obtained from the UK quality and outcomes framework. Results: Rates of COPD admissions remained stable from 2001 to 2010. Practice prescribing volumes of LAMA per practice patient and LABA+ICS per practice patient increased by 61% and 26% respectively between 2007 and 2010. Correlation between costs of LAMA and those of LABA+ICS rose year on year, highest in 2010 (Pearson’s r=0.68; 95% CI 0.64 to 0.72). Practice COPD admission rates were positively predicted by practice prescribing volumes of LAMA (2010: B = 1.23, 95% CI 0.61 to 1.85) and of LABA+ICS (2010: B = 0.32, 95% CI 0.12 to 0.52) when controlling for practice list size, COPD prevalence and deprivation. Conclusions: Rising prescribing of LAMA and LABA+ICS inhalers was not associated with a fall in hospital admission rates for COPD patients. The positive correlation between high practice COPD prescribing and high practice COPD admissions was not explained.