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Title: A systematic review of models of COPD epidemiology

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Body: Background Recent figures from the Global Burden of Disease Study 2010 show that the third top global cause of death was Chronic Obstructive Pulmonary Disease. To plan future healthcare priorities, detailed understanding is needed of COPD prevalence and burden and how it will evolve. COPD epidemiological models are available. Objectives 1. To systematically review existing models which project COPD prevalence and burden 2. To assess the included studies for quality of reporting. Methods A systematic review protocol was registered with PROSPERO. Seven databases and Google were searched for published and unpublished articles from 1980 to July 2012. Two reviewers selected studies for inclusion. Included were epidemiological models which sought to project the incidence, prevalence and mortality of COPD and burden of COPD in terms of general practice visits, emergency department visits, hospital admissions and treatment costs. Excluded were all animal models and individual prognostic models. Two reviewers agreed a quality of reporting score for each model according to a framework. Results 20 models were identified and received widely varying quality scores. The models which were used by the World Health Organisation including DISMOD and POPMOD are among the most highly scoring models (16-17/20). Other high scoring models include those developed by a team in Rotterdam, The Netherlands. Models depended on different and varied epidemiological inputs and had different levels of mathematical complexity. Conclusions The application of epidemiological models to different countries' COPD populations, including developing nations, will be limited by the availability of accurate epidemiological data.