Application number/Title: 35826: Predicting longitudinal outcomes in chronic obstructive pulmonary disease

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Keywords provided by the Applicant PI to describe the research project:

cardiovascular, copd, genetics, mortality, outcomes, prediction

Application Lay Summary:

Cardiovascular disease (CVD) is believed to be a common comorbidity in chronic obstructive pulmonary disease (COPD). The literature indicates a third of deaths in COPD to be related to CVD. However, the reliability of classifying causes of death has been questioned, and there is uncertainty about the incidence of CVD. Findings do not match clinical data from the Evaluating the Role of Inflammation in Chronic Airways disease (ERICA) cohort, nor published data from the late 60s. The aim is to validate results in the UK Biobank, and develop and validate a prediction model including phenotypic and genotypic risk factors. Identifying the primary cause of death, and incidence of non-fatal events such as ischaemic heart attack in COPD patients can inform how COPD patients should be defined in clinical practice, and support treatment decisions and the clinical pathway. In addition, most risk models are out-dated as they do not reflect the current population and are developed using old-fashioned methodology. Using cutting-edge methodology including incorporating genetic data in risk prediction are expected to improve prediction accuracy, support drug development and treatment, ultimately improving health outcomes. Within the UK Biobank cohort, subjects with spirometry defined COPD will be defined according to lung function test results, age, smoking history and pack years, and the amount of pulmonary obstruction. Socio-demographic data will be linked to health outcomes data (i.e. hospital admission and mortality) and to the genetic data. Risk models will be developed using statistical techniques incorporating socio-demographic, outcomes, and genetic data. We request the full cohort required to include those with spirometry defined COPD, physician diagnosed or self-reported COPD, those who recently started COPD medication, and those who have been admitted to hospital for COPD or CVD. In addition, the full cohort is required to compare patterns of cause of death in COPD patients compared with the general population. For the development of the genetic-based risk model the

full cohort is required.