

## Predictors of decline in eGFR in patients with CKD in the UK: Findings from the longitudinal study of routinely collected GP records

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**Background:** Development of novel, appropriate methodologies to assist in the analysis of large and complex longitudinal datasets is vital in the field of statistical analysis of public health data. The application studied here is the natural history of Chronic Kidney Disease (CKD). CKD is a multistage, progressive disease which is an important cause of morbidity and mortality. Understanding the progression and causes of CKD is important since it currently affects around 10% of the population in UK.

**Methods:** The longitudinal data on 876951 patients were extracted from data which had been routinely collected by around 130 medical General Practices (GPs) in England and Wales. Records of age, gender, ethnicity, latest serum creatinine values, diagnosis of hypertension, Ischaemic heart disease (IHD), anaemia, diabetes, stroke, obesity and latest GFR estimation where the latter is done on the basis of estimated GFR values calculated using the abbreviated Modification of Diet in Renal Disease (MDRD) formula or on serum creatinine thresholds for each individual, adjusted using the MDRD equation, are used in logistic regression models which are carried out to explore any association between these co-morbidities and CKD diagnosis.

**Results:** It is found that in this data people having both IHD and CKD are 5.4 times as common as people having just IHD alone. A similar pattern is also observed for diabetes, where people having both diabetes and CKD are reported been 3.5 times as common as people having just diabetes alone. Women were found to have higher incidence of CKD compared with men (67.5% versus 32.5%). The gender relationship was adjusted for age and ethnicity in our model.

**Conclusion:** By using the whole population and diagnosis of CKD by eGFR, the highest probability of having CKD diagnosis based on any single co-morbidity is found if a patient has hypertension diagnosed 14.67% chance of CKD versus 3.13% probability of CKD diagnosis if no co-morbidities are observed for a patient. Further investigation should be carried on the factors affecting hypertension, such as blood pressure, to model the decline of eGFR over time.

**MeSH Terms:** Longitudinal study, logistic regression, chronic kidney disease, GP records.

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