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The Development and Implementation of The Wales Multi-Morbidity Electronic Cohort: Prospective and Retrospective Study Designs to Investigate Multi-Morbidity

Lyons, J[1*], Agrawal, U[2], Harper, G[1], Akbari, A[1], Bailey, R[1], Fry, R[1], Rafferty, J[1], Watkins, A[1], Robson, J[3], Dezateux, J[3], McCowan, C[2], and Lyons, R[1]

[1]Health Data Research UK, Swansea University

[2]Health Data Research UK, St Andrews University

[3]Health Data Research UK, Queen Mary University of London

Introduction

Multi-morbidity is a widely recognised but poorly understood global issue that appears to be increasing in prevalence, according to the UK's Academy of Medical Sciences (AMS) report in 2018. Disease clustering, their determinants and consequences are poorly researched. Better understanding would help drive prevention and improved clinical care, services and patient outcomes.

Objectives and Approach

Development of two comprehensive population-wide e-cohorts, derived utilising data linkage techniques and including multi-sourced anonymised routine health and demographic data held within the SAIL Databank. The objective is to characterise multi-morbidity and its clustering, determinants and outcomes and compare methods using a) prospective cohort design using multiple data sources in Wales and b) retrospective cohort design to examine household level and environment clustering using GP data in demographically diverse populations (Wales and North East London).

The prospective e-cohort focuses on adults living in Wales on 1st January 2000 and followed up to 2020, including data from the NHS population register, deaths, inpatients, outpatients, Emergency Department, GP, disease registries, laboratory data, and population surveys with QoL measures. This e-cohort will be harmonised with other sites across the UK. The retrospective e-cohort is designed to harmonise with a North East London e-cohort, including all individuals living in Wales on 24 th April 2018 and registered with a GP.

Results

2.8 and 2.2 million individuals have been included in the prospective and retrospective cohorts respectively, with 43.6 million person years of follow up. Established comorbidity indices and published phenotypes from libraries are being applied to the data to create initial prevalence and incidence estimates for further analysis. Important clusters will be determined by associations with mortality and excess healthcare utilisation.

Conclusion/Implications

Building the e-cohorts has involved multiple disciplines across organisations. Multi- morbidity prevalence estimates and study designs will be compared prior to statistical analyses and machine learning methods to evaluate clustering and determinants.

*Corresponding Author:
Email Address: J.Lyons@Swansea.ac.uk (J Lyons)

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