

# Using Routinely Collected Electronic Healthcare Record Data to Investigate Fibrotic Multimorbidity in England [Response to Letter]

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## Dear editor

We would like to thank Wijaya et al for their correspondence regarding our recent publication.<sup>1</sup> They raise important points regarding electronic healthcare records (EHRs), we are grateful for the opportunity to explore these with respect to UK healthcare.

## EHRs in Action

EHRs are routinely collected when delivering healthcare. They contain a large quantity of information including symptoms, diagnoses, prescriptions, referrals, and test results.<sup>2</sup> EHRs can be used more broadly, for performance monitoring, benchmarking services, and measurement of public health trends, essential in optimising healthcare delivery. They are a fruitful data source for research, and can be used to understand a plethora of disease aspects and are frequently used in epidemiology, including the recent COVID-19 pandemic.<sup>3</sup>

## Data Quality and Biases

Clinical Practice Research Datalink (CPRD) is currently the largest and most comprehensive source of EHR data in the UK. Data linkage allows for a greater range of research to be conducted, by capturing a more detailed picture of a person's health. However, this is not without issue, as sometimes there can be delay in the availability of linked data from third-party providers, limiting the scope of potential studies in near real time.

## Inconsistency, Missing Data, and Classification Errors

The Quality and Outcomes Framework (QOF) is a points based remuneration programme, introduced in 2004 to incentivise General Practices to record findings across four domains.<sup>4</sup> QOF has significantly improved the recording of variables related to chronic conditions, and the quality of care and EHR quality has subsequently improved.

In primary care, the EHR is updated by the practitioner, therefore it is important to understand the implications of poor coding practices and appreciate their role in accurately reporting findings within the record. Clinical codes or free text can be used to record information; however, it is not possible to access free text for research purposes, due to the lack of anonymity. Therefore, emphasis should be put upon coding all findings, irrespective of clinical significance.

Negative results of tests are less likely to be reported, and therefore in some instances it may appear as though someone has not been tested. Findings which are deemed irrelevant to the primary presentation of the patient may not be recorded and can also be heavily biased by clinician opinion. Another commonly encountered problem is the variability in the units for which test results are recorded within EHRs. With many possible units and conversions possible, it is imperative to standardise measures.

## Standardisation of Methodology

Codelists are used to define exposures, outcomes and covariates in epidemiological analyses using EHRs. In 2015, the RECORD statement was created, detailing the information which should be present in manuscripts using EHRs.<sup>5</sup> This statement aimed to standardise the epidemiological literature; however, few EHR publications include codelists. This lack of transparency is two-fold; it minimises interpretation of results and reproducibility. The HDR UK Phenotype Library was created to provide a centralised system for researchers to upload and search for codelists.

EHRs will continue to be used, therefore it is crucial that they are optimised, and data are of the highest quality.

## Disclosure

The authors report no conflicts of interest in this communication.

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