NICE National Institute for Health and Care Excellence

Generating evidence for HTA using the OMOP common data model and standardised analytical tools

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Background

- NICE is the HTA body for England
  - Make reimbursement decisions for new medical technologies
  - Issue clinical guidelines

- NICE are a partner in EHDEN

- Aims within EHDEN
  - Understand the usefulness of the common data model, standardised analytical tools, and the federated data network for HTA in Europe
  - Inform the further development of OMOP and tools

- Evidence generation for regulatory and HTA decision-making

What is HTA?

- Systematic evaluation of properties and effects of health technologies to inform medical decision making

- Follows regulatory authorisation and can be used to make reimbursement and/or pricing decisions

- Can include
  - Relative effectiveness assessment
  - Cost-effectiveness assessment
  - Budget impact analysis
  - Decision modelling

The role of RWE

- Comparative effectiveness
  - Main evidence or supplement, managed access, reviews

- Other uses
  - Characterise target population, treatment pathways and utilisation, and outcomes
  - Model epidemiological data (e.g. incidence, death rate)
  - Extrapolation of overall and progression free survival
  - Model healthcare utilisation and cost, HRQL
  - Understand relationship between surrogate and final clinical endpoints
  - Validation

What is the value of OMOP to HTA?

- Data identification & access

- Multidatabase studies
  - Increase precision, explore heterogeneity, validate findings, translate results to other populations or settings

- Timely and robust evidence generation

- Transparency
  - Use of open-source standardised tools
  - Impose good research practices
  - Tools for quality assessment

Healthcare utilisation in COPD

- Aims
  - Estimate annual primary care healthcare visits for patients with COPD by disease severity
  - Model outcomes by staff role (GP, nurse practitioner, other) and visit type (clinic, home, telephone)

- Data
  - CPRD (UK; via University of Oxford)
  - IPCI (NL; via Erasmus MC)

Healthcare utilisation in COPD, challenges

- Representation of healthcare visits in OMOP
- Mapping of utilisation data
- Analytical tools

Representation of healthcare visits in OMOP

- Relevant tables
  - Visit occurrence
  - Provider specialty
  - Care site

- Vocabularies
  - Visit (OMOP)
  - Provider (OMOP)
  - Others, e.g. HES specialty, NUCC, Medicare specialty, UB04, …

Mapping of utilisation data, CPRD

- Source data
  - ‘consultation’ table contains all interactions with primary care including admin tasks, i.e. not just GP visits
  - ~70 staff roles and visit types

- Mapping (Janssen / Oxford)
  - No pre-cleaning
  - Visit occurrence: all interactions mapped to ‘Outpatient visit’ (9202)
  - Provider specialty: mapped to 25 standard concepts across 4 vocabularies; ‘Unknown Physician Specialty’ used for diverse providers including GPs and administrative functions
  - Care site: no mapping; all contacts recorded as ‘Public Health Clinic’

Mapping of utilisation data, IPCI

- Mapping (EMC)
  - Pre-cleaning, retain GP visits
  - Visit occurrence: all interactions mapped to ‘Outpatient visit’ (9202)
  - Provider specialty: no mapping
  - Care site: no mapping; all contacts recorded as ‘?’

Analytical tools

- Modelling annual healthcare utilisation and cost data
  - Continuous outcomes (or counts)
  - Highly skewed, excess zeros
  - Panel data
  - GLM, two-part models / zero-inflated models
  - Model outcomes as a function of GOLD stage and other covariates (e.g. age, sex, exacerbations, MI, BMI, smoking)

- What kind of question is this?
  - Characterisation? PLE? PLP?

- Developing tools for model estimation & exploration

Recommendations

- Ensure HTA or health service research expertise in mapping data to the OMOP common data model
- Consider extensions to vocabularies to reflect main categories of healthcare visit
- Standardised recording of type of visit
- Develop tools and dashboards for HTA
  - Continuous outcome models
  - Extrapolation