

Real World Assessment and Research of Drugs benefits (REWARD-B)

A Technical implementation that aids the identification of unexpected benefits

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INTRO:

REWARD-B builds upon the OHDSI HADES suite of software tools to provide a comprehensive manner of performing population level estimation (PLE) at the scale of all medications by all diseases.

METHODS

- By building on the CDM it is possible to generate high quality, reproducible PLE studies across different observational health datasets.
- Self-controlled cohort study designs control for confounding by allowing individuals to act as their own controls
- Cohorts are automatically generated from standard vocabulary concepts and can also be imported from ATLAS
- Negative controls are selected automatically, by building on the common evidence model.
- Empirical calibration provides reliable effect estimates, adjusting for systematic bias.

RESULTS

- This software is fully open source and part of the OHDSI communities on-going efforts to produce reproducible observational health research
- Previous work has generated hypotheses for existing medications with protective effects against Alzheimer's and Parkinson's disease.

CONCLUSIONS

REWARD-B builds on top of the OMOP CDM and OHDSI software libraries to provide signal detection at scale for hypothesis generation with unexpected benefits.

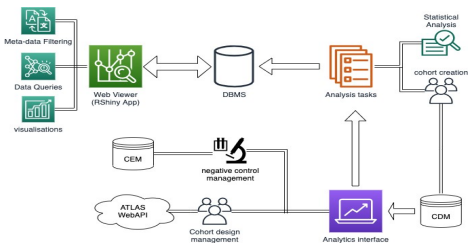


Figure 1. REWARD-B Combines the OMOP CDM, OHDSI Analytics software, Self-controlled cohort studies and an Rshiny web application interface to report robust signal detection results for hypothesis generation.

Uncovering previously unknown benefits of existing medications using large-scale analytics of observational health data sets

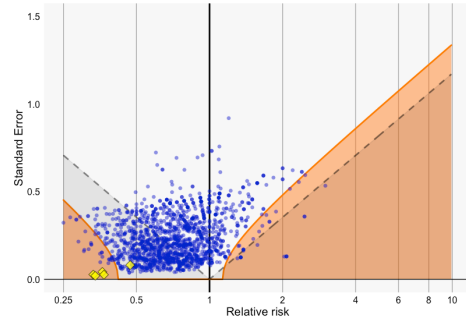


Figure 2. Example Calibration Plot. REWARD-B allows the empirical calibration of p-values and confidence intervals to reduce the number of false positive results caused by systematic error. X axis shows risk, y axis shows standard error. Yellow diamond indicate observed IRR values, blue dots indicate values of negative controls. Results in shaded area are considered to be statistically significant.

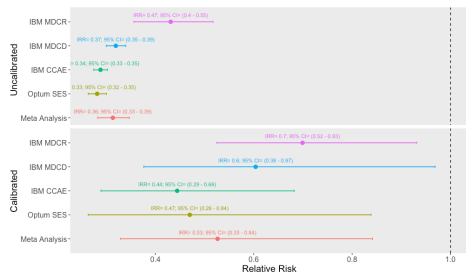


Figure 2. Example Forest plot shows calibrated and uncalibrated IRR values across 4 databases and meta-analysis with random effects for all patients with Bipolar disorder.

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