



## **Objective**

Validity indices of  $M_Y$  can be used to adjust effect estimates by misclassification errors. Conducting validation studies to estimate validity indices is often unfeasible, due to resource limitations or privacy issues.

We show that the complete set of validity indices can be analytically derived from a small set of input parameters.







# Obtaining estimates of outcome validity from a small set of parameters: the *component strategy* from the ADVANCE project





## **Application**

The problem of assessing validity of case-finding algorithms can be reduced to a small set of input parameters. The rest of the information is obtained empirically from observing the prevalence of the component algorithms and of their intersections.

## Conclusion

This set of formulas may be implemented in the OHDSI set of tools and support exploration of the validity of the case-finding algorithms used to define study outcomes, based on information that can be found in the literature, and on empirical observation.

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## **Composition of two algorithms**

Similarly, it can be proven that the validity of the composition of two algorithms A and B is interrelated with the validity of the components. This allows to compute all the indices starting from any combination of 3 parameters between validity indices of the components or of the composite, or true prevalence.

For instance, if  $\pi$ ,  $PPV_A$  and  $PPV_B$  are known, then

 $\underline{P_A \ PPV_A} \ P_B \ PPV_B \ P_A \ \text{and} \ B \max(PPV_A, PPV_B)$  $SE_A$  or  $_B =$  $PPV_A \text{ or } B = \frac{SE\pi}{D}$ π true frequency P observed frequency PPV positive predictive value

Or, if  $SE_{A \text{ OR } B}$ ,  $PPV_{A}$  and  $PPV_{B}$  are known, then

 $P_A PPV_A PB PPV_B P_A \text{ and } B\max(PPV_A, PPV_B)$ SESESE $SE\pi$  $PPV_A \text{ or } B = \frac{2}{P}$ 

Each database of the network participating in a multi-database study may define its study outcome as the composition (via OR logical connectors) of a particular set of components.



E sensitivity



Validity of the necessary input parameters can be estimated from ad-hoc validation studies, or obtained by assuming transportability of parameters found in the literature, or by developing scenarios.

