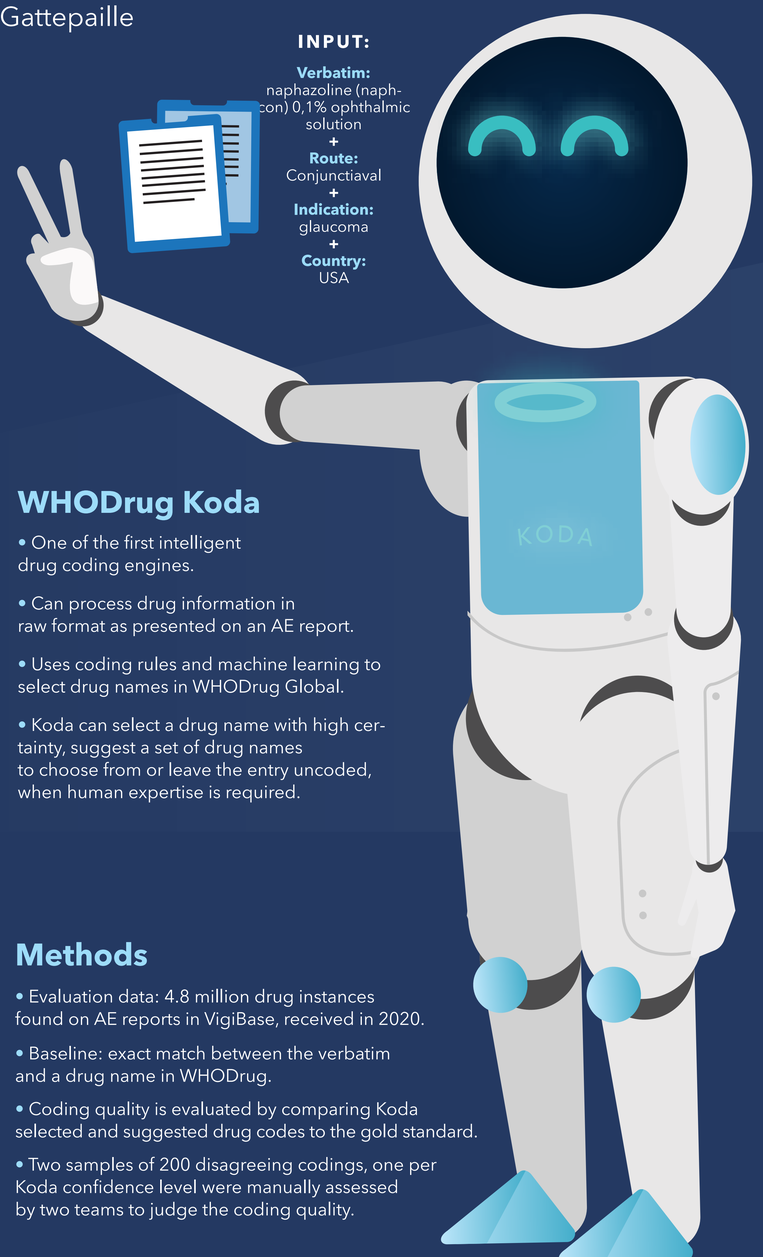
P105

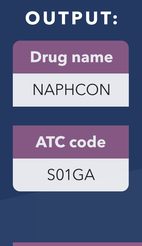
AI-Powered Drug Coding With WHODrug Koda: An Evaluation on Adverse Event Reports

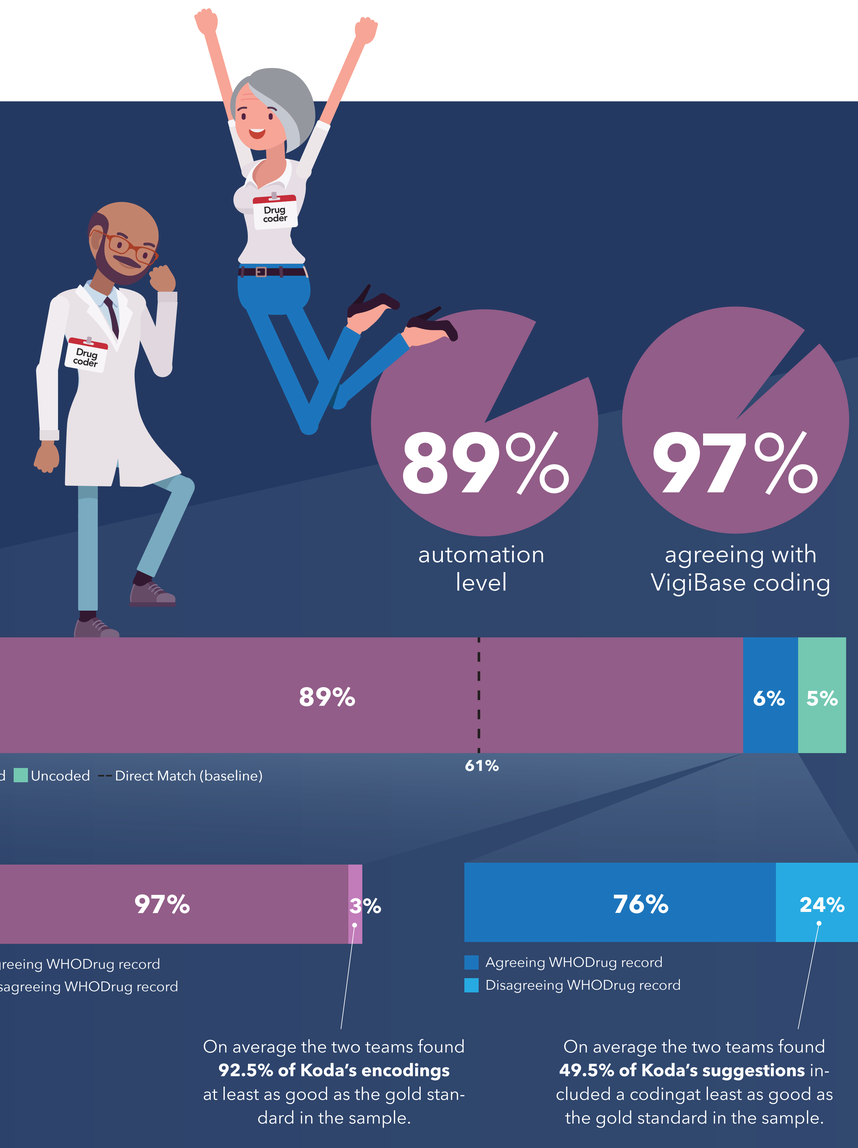
AI-Powered Drug Coding With WHODrug Koda:
An Evaluation on Adverse Event Reports

Authors: E.L. Meldau, S. Bista, E. Rofors, L.M. Gattepaille

Uppsala Monitoring Centre







WHODrug Koda

- One of the first intelligent drug coding engines.
- Can process drug information in raw format as presented on an AE report.
- Uses coding rules and machine learning to select drug names in WHODrug Global.
- Koda can select a drug name with high certainty, suggest a set of drug names to choose from or leave the entry uncoded, when human expertise is required.

Background

Coding medicinal product information from an adverse event (AE) report into standardised terminologies, such as WHODrug Global[1], is a time-consuming activity during case processing[2], which has great potential for automation.

Aim

Evaluate the drug coding performance of WHODrug Koda on adverse event reports from VigiBase, the World Health Organization's global database of suspected adverse reactions to medicinal products, in terms of level of automation and coding quality.

Methods

- Evaluation data: 4.8 million drug instances found on AE reports in VigiBase, received in 2020.
- Baseline: exact match between the verbatim and a drug name in WHODrug.
- Coding quality is evaluated by comparing Koda selected and suggested drug codes to the gold standard.
- Two samples of 200 disagreeing codings, one per Koda confidence level were manually assessed by two teams to judge the coding quality.

Results

- Koda can automatically code large proportions of drugs (89%), including ambiguous drug names.
- Designed to only code when confident, Koda can identify challenging cases and leave these for manual coding, while making helpful suggestions for a large proportion of inputs.
- Koda's high-certainty predictions and suggested encodings have a high quality.

Conclusion

Originally developed for the use in clinical trials, Koda reaches equally good performance on adverse event reports[3]. Koda can thus be a valuable tool for increasing drug-coding efficiency in the post-marketing context.

References/Further sources of information

1. Lagerlund O, Strese S, Fladvad M, Lindquist M. WHODrug: a Global, Validated and Updated Dictionary for Medicinal Information. Therapeutic Innovation & Regulatory Science. 2020 Feb 20:1–7.

2. Ghosh R, Kempf D, Pufko A, Martinez LF, Davis CM, Sethi S. Automation Opportunities in Pharmacovigilance: An Industry Survey. Pharmaceutical Medicine. 2020 Feb;34(1):7–18.

3. Herrgard S, Gil C, Holst I, Nielsen JH, Ranthe MF, Serif A, et al. Assessment of Machine Learning Methods in Coding of Concomitant Medications in Clinical Trials. In: PhUSE Connect US, 8–11 March 2020, Orlando, USA; 2020. Available from: *https://www.lexjansen.com/phuse-us/2020/ml/ML13.pdf*.

Uppsala Monitoring Centre