Scientific Reports Title to see here

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ABSTRACT

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Please note: Abbreviations should be introduced at the first mention in the main text – no abbreviations lists. Suggested structure of main text (not enforced) is provided below.

Introduction

Medications represent the most common intervention in health care, despite their benefits; they also lead to an estimated 1.5 million adverse drug events and tens of thousands of hospital admissions each year. Although most are not preventable given what is known today, many types are, and one key cause is drug-drug interactions (DDIs).[1]

DDI plays the role of a still not deep-enough research field which has the potential to open the backdoor of numerous comorbidities and confusing drug trajectories that are likely to increase in significance for the following decades.

Its importance comes from diverse factors like difficulty to determine whether adverse events are the result of side effects from a single drug, interactions between two or more drugs, or exacerbations of the patient's underlying disease [2], or incompleteness regarding drug labeling [3]. These should be given a sensible focus so as to take the first steps towards a complete and structured network of DDI and its adverse events (AE).

This project aims to characterize drug interaction profiles from danish population treated in hospitals of the Capital and Sealand Region in the years 2006-2016. It can be considered as a novel step of determining biological patterns and networks, in patients, from DDIs.

Materials and Methods

Knowledge about drug–drug interactions commonly arises from preclinical trials, from adverse drug reports, or based on knowledge of mechanisms of action[4]. The main source comes from a free-published dataset of DDI/PDDI interactions that includes 5 clinically-oriented information sources, 4 Natural Language Processing (NLP) Corpora, and 5 Bioinformatics/Pharmacovigilance information sources[3]. For sake of the short time this research will last, we have filtered information and retrieve just the most significant and cited ones.

Extraction of information

Drugbank

Resources come from **Drugbank XML dataset** that can be downloadable from the website. Using a R package specific for this document; DBparsed, it has been transformed into a variety of datasets covering interactions, pathways, and groups that drugs belong to. Moreover, a list of PDDIs was provided from the GitHub account updated to February 2018.
Both of them gives a simple description of how one drug affects the other.

KEGG
Accessed the REST API of KEGG database to extract DDI interactions from each one, providing extra information such as mechanism of action, as well as other kind of interactions which may be relevant. Code of manual extraction can be accessed from the additional resource. From GitHub account, we have KEGG drug identifiers mapped to Drugbank

Twosides
Several sort of information can be recovered from Twosides webpage where we count with a dataset of DDI detailing disease provoked, and another describing side effects from the same ones.

NDF-RT
This database stopped to be updated from 2014 and all resources were recollected from the GitHub account. It is also available the IDs mapped to Drugbank.

DDI Corpus 2013
From the NPL Corpora, the four databases have a high overlap between them. It has been chosen DDI corpus 2013 due to it has most number of interaction and results to be the most updated one.

Results

Up to three levels of **subheading** are permitted. Subheadings should not be numbered.

Subsection
Example text under a subsection. Bulleted lists may be used where appropriate, e.g.

- First item
- Second item

Third-level section
Topical subheadings are allowed.

Discussion

The Discussion should be succinct and must not contain subheadings.

References

1. David C. Classen, M. . S. P. R. P. , MD & David W. Bates, M., MD. Critical drug-drug interactions for use in electronic health records systems with computerized physician order entry: Review of leading approaches. *figshare* https://insights.ovid.com/crossref?an=01209203-201106000-00001 (2011).
2. Percha, B. & Altman, R. B. *figshare* https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3808975/ (2013).
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4. Peter Wæde Hansen, T. S. S. E. L. F. C. T.-P. L. K. G. H. G., Line Clemmensen & Andersson, C. *figshare* https://www.ahajournals.org/doi/10.1161/CIRCOUTCOMES.116.003055 (2016).

LaTeX formats citations and references automatically using the bibliography records in your .bib file, which you can edit via the project menu. Use the cite command for an inline citation, e.g.[1234]

For data citations of datasets uploaded to e.g. *figshare*, please use the `howpublished` option in the bib entry to specify the platform and the link, as in the `Hao:gidmaps:2014` example in the sample bibliography file.

Acknowledgements (not compulsory)

Acknowledgements should be brief, and should not include thanks to anonymous referees and editors, or effusive comments. Grant or contribution numbers may be acknowledged.

Author contributions statement

Must include all authors, identified by initials, for example: A.A. conceived the experiment(s), A.A. and B.A. conducted the experiment(s), C.A. and D.A. analysed the results. All authors reviewed the manuscript.

Additional information

To include, in this order: **Accession codes** (where applicable); **Competing interests** (mandatory statement).

The corresponding author is responsible for submitting a competing interests statement on behalf of all authors of the paper. This statement must be included in the submitted article file.

Figure 1. Legend (350 words max). Example legend text.

Condition	n	p
A	5	0.1
B	10	0.01

Table 1. Legend (350 words max). Example legend text.

Figures and tables can be referenced in LaTeX using the ref command, e.g. Figure 1 and Table 1.