

MeSHgram: An Open Source Tool to Visually Browse Co-occurrence of MeSH Terms in PubMed

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Background

MeSHgram is a tool for visual and interactive exploration of co-occurrence of Medical Subject Heading (MeSH) terms in PubMed. It uses the MeSH terms associated with PubMed articles to visualize co-occurrence over time. The potential applications are:

- Visual browsing / querying of PubMed
- Support metadata analysis of literature in PubMed
- Hypotheses generation

Methods

We parsed the NLM PubMed corpus¹ and extracted the ID, year of publication and MeSH terms associated with each document. As of Jan 2017, the corpus had approx. 24.5 million publications from 1809 to 2016². We excluded duplicate items such as revision entries and those with no MeSH terms, resulting in approx. 23 million publications.

We use a simple architecture (Figure 1) for implementation. The extracted data is stored in a **MongoDB** object store. We use a Python web controller (**CherryPy**) and JavaScript (**nvd3**, **jqcloud**) for the front-end.

Figure 1. MeSHgram conceptual architecture

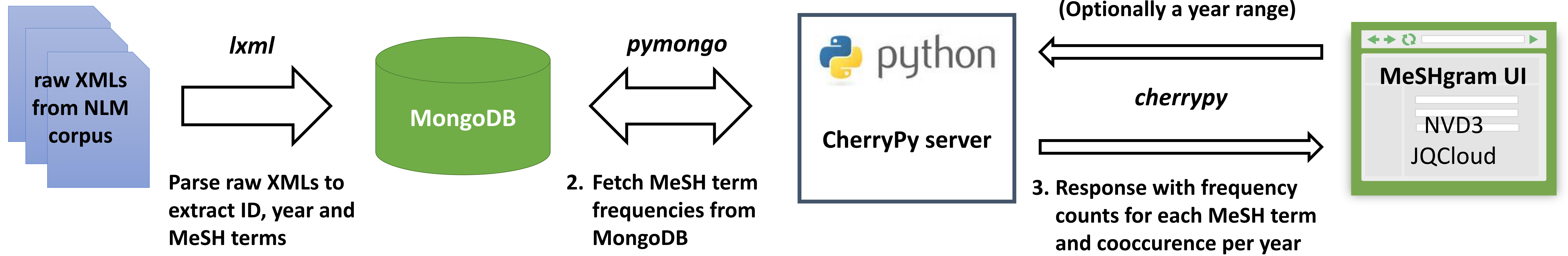


Figure 2. Screenshot of MeSHgram UI illustrating different features. Showing co-occurrence of “Rubella” and “Rubella Vaccine”.

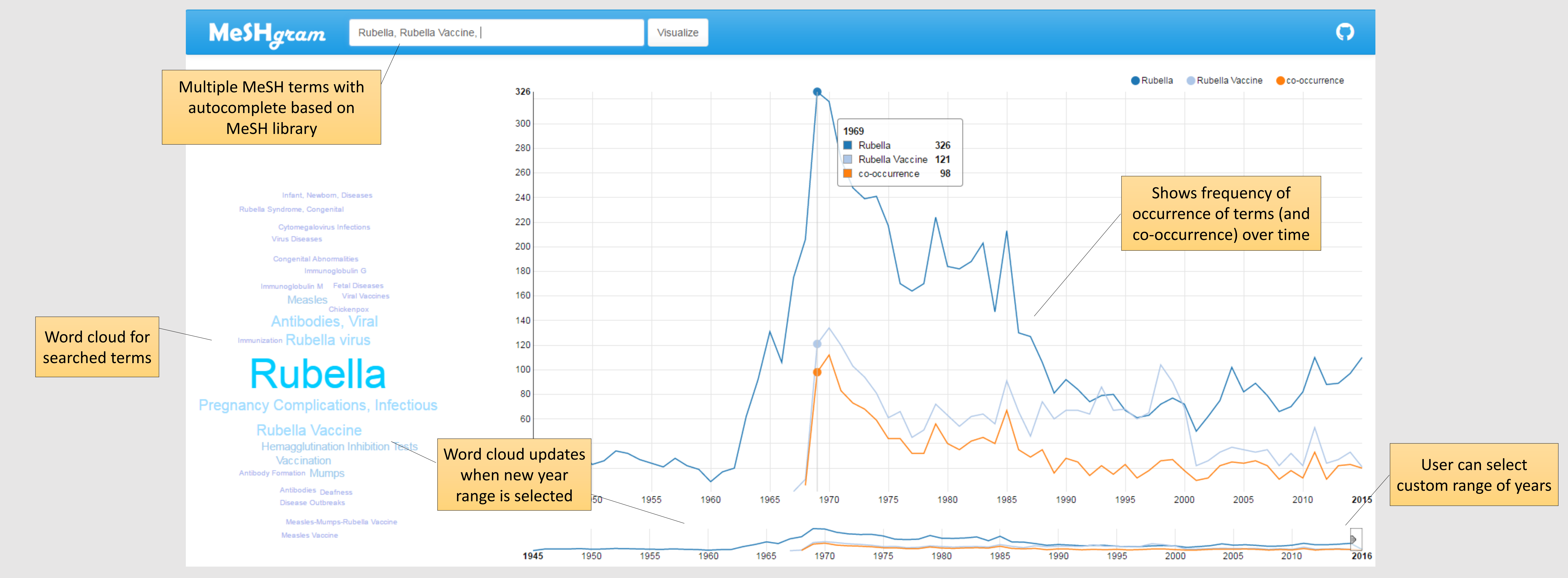
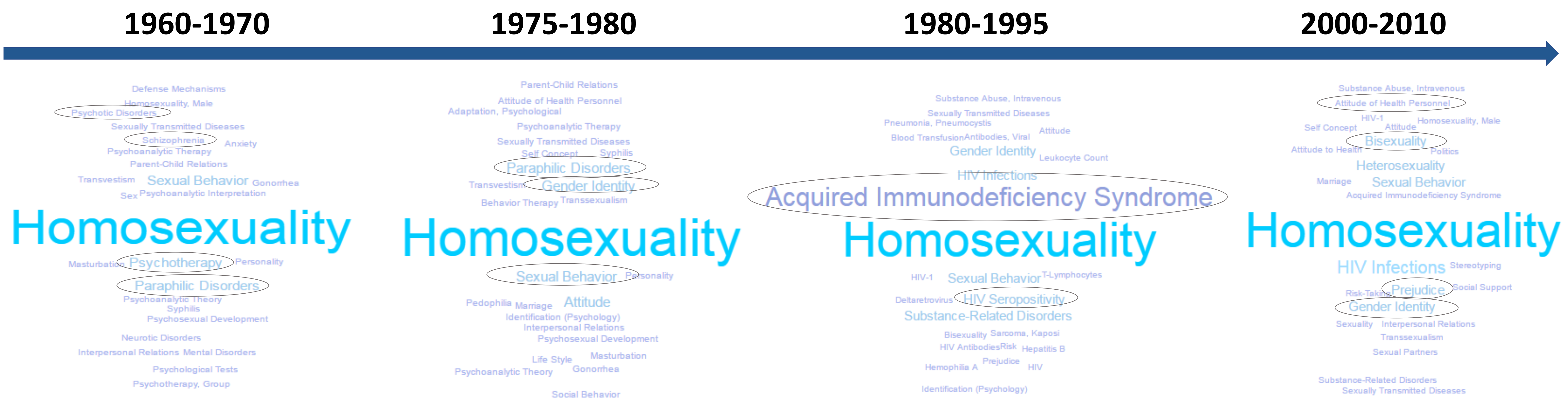


Figure 3. Example retrospective study. Evolution of Homosexuality in medical literature from a MeSH perspective.



References

- https://www.nlm.nih.gov/databases/download/pubmed_medline.html
- https://www.nlm.nih.gov/bsd/licensee/2016_stats/baseline_med_filecount.html

Looking for a new home!

Code is available at https://github.com/NCBI-Hackathons/Visualizing_MeSH_Term_Interaction_Over_Time