SWIFT-Review: A Text-Mining Workbench for Systematic Review.

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Abstract: Here, we introduce "SWIFT-Review" (SWIFT is an acronym for "Sciome Workbench for Interactive computer-Facilitated Text-mining"), a freely available, interactive workbench that provides numerous tools to assist with problem formulation and literature prioritization. SWIFT-Review can be used to search, categorize, and visualize patterns in literature search results. The software utilizes statistical modeling and machine learning methods that allow users to identify over-represented topics within the literature corpus and to rank-order titles and abstracts for manual screening. We have tested the automated document prioritization feature on 20 previously conducted systematic review datasets, and the results presented clearly suggest that using machine learning to triage documents for screening has the potential to save, on average, more than 50% of the screening effort ordinarily required when using un-ordered document lists. In addition, the tagging and annotation capabilities of SWIFT-Review can be used to produce "scoping reports" or "scoping studies," a type of knowledge synthesis undertaken to guide the direction of future research priorities or to help with problem formulation when conducting a systematic review. As a result, users can more quickly assess the extent of available evidence, prioritize health outcomes and chemical exposures for systematic review, and understand the degree of evidence integration that may be required. In addition, the resulting visualizations can help to identify topics that have been extensively studied as well as emerging areas of research. SWIFT-Review integrates seamlessly with other text-mining platforms including Active-Screener and HAWC. The software remains under active development with several new features planned. Disclaimer: The views expressed in this abstract are those of the authors and do not necessarily represent the views or policies of the U.S. Environmental Protection Agency.