

Improving Transparency in Patent Landscaping Exercises: The Reporting Items for Patent Landscapes (RIPL) Statement and Other Considerations

Abstract

The Reporting Items for Patent Landscapes (RIPL) checklist aims to improve the transparency and completeness of reporting of patent landscapes. It lists items that should minimally be reported in academic papers incorporating patent landscapes. Though it was developed based on evidence from the life sciences and focussed on academic articles, it could also be useful for a broader range of stakeholders. Here, I introduce readers to RIPL, discuss how it may be useful in academia, policy/government and industry, and highlight other resources to use with it. Further steps that could be taken to improve reproducibility, including open code and protocol registration, are then highlighted.

1.1 Background

Patent landscapes are analyses of multiple patent documents which can be used for a variety of purposes, such as assessing technological progress, tracking innovation, or identifying R&D opportunities[1]. A need for harmonization in patent landscaping methodologies[2] and a lack of appropriate reporting of patent landscape articles[3] has been highlighted. For many types of medical studies, reporting guidelines, which aim to improve the completeness of reporting in articles, have been developed. A reporting checklist focussed on patent landscapes, RIPL, was therefore developed via a consensus method with input from academic and industry stakeholders[4]. The RIPL checklist is provided in Table 1. The checklist lists the minimal items that should be reported in a patent landscape article published in an academic journal. A detailed explanation of each of these items is provided in the original publication's supplementary materials (<https://www.nature.com/articles/nbt.4291#Sec3>) [4]. In the supplementary material for this article, I provide a version of the checklist that can be used to indicate on which page of a report each item is reported.

Table 1: Reporting items for patent landscapes (RIPL) checklist: items that should be reported as a minimum. A detailed explanation of each item is available in the supplementary material of the publication in which this table first appeared [4] (<https://www.nature.com/articles/nbt.4291#Sec3>)

Item No./ Section	Topic	Checklist Item
<i>Title</i>		
1	Title	Identify that the article includes a patent landscape and state the subject matter under investigation (e.g. gene editing technologies)
<i>Summary/Abstract</i>		
2	Background and summary	Provide a summary which includes the background, rationale, results and main findings in the context of the aims
<i>Introduction</i>		
3	Rationale	Describe the rationale for the study, including relevant background information and the potential impact of the investigation
4	Aims	Describe the aims of the study

<i>Methods</i>		
5	Search	State the databases and patent offices searched, the dates on which the searches were conducted, and the components of the patents (fields) searched. Include the search terms used for all databases searched.
6	Selection criteria	Include details of the selection criteria of patents to be included in the patent landscape, including the subject matter of those patents
7	Identification of relevant patents	If applicable, state how patents identified in searches were sorted for relevance
8	Data extraction	List and define all information that was collected from the patent documents in the patent landscape (e.g. technical area, date of publication), if any software was used to extract the data, and the protocol if the information sought from a patent document was not available
9	Analysis	Describe any analysis and synthesis of results
10	Patent family designation	State the source of patent family designations (e.g. Derwent or INPADOC) if any analysis incorporated patent families ¹
<i>Results</i>		
11	Patent selection	State the number of patents (or patent families) assessed for eligibility, the number included in the study, and the reasons for exclusion at each stage of the process. A flow diagram may be useful
12	Data standardisation	Provide details of any steps taken to standardise or normalise the data. Examples would typically include correcting misspellings, and discussion of assumptions associated with licensing or mergers and acquisitions.
13	Summary	Summarise the patents included in the study (e.g. with reference to the data extracted from them, geographical distribution, temporal distribution)
14	Analysis	Present and explain the results of any analysis (statistical or otherwise) conducted. Include details of settings used for any analyses (e.g. spatial concept maps). For any temporal analysis, include details of what year convention was used (e.g. earliest priority year, application year, publication year)
15	List of patent numbers	List the patent publication numbers for any patents included in the study (the supplementary material will often be a suitable location for this) ²
<i>Discussion</i>		
16	Summary	Summarise the main findings, how they relate to the aims, and to whom they may be relevant
17	Limitations	Discuss any limitations of the work in the context of the reliability of the conclusions; include discussion of limitations related to the methodology and software. If applicable, include information relating to how sources of error were reduced
18	Context	Explain how the findings relate to other studies in the field, how the study builds upon previous work, its potential impact, and implications for future research

19	Conclusions	Provide a conclusion which gives a general interpretation of the results in the context of other evidence
<i>Other</i>		
20	Conflict of Interest	Disclose any potential conflicts of interest
21	Funding	Disclose any sources of funding for the study and the role of the funder in the study, and any other support received during the study (e.g. supply of data)
<ol style="list-style-type: none"> 1. This should include the chosen patent family definition used in the report 2. Providing a link to a publicly available database that the reader can readily check is good practice 		

1.2 Use in Academic Articles

The RIPL checklist is aimed at authors, reviewers and editors of academic patent landscape articles. For authors, reporting the items in the checklist ensures that the key information required to understand a study is available in the publication. This should improve the ability for others to critically evaluate, reproduce, or combine into later analyses the work that has been done. Although aimed at reporting, RIPL may also be useful when planning patent landscapes to ensure that important aspects of the study design are considered early in a project, where it is much less time consuming to make changes. In a journal that encourages the use of the checklist, complying with the checklist should also, all else being equal, increase the likelihood of an article being accepted for publication. For journal editors, many of the same benefits can be seen: encouraging better reporting should lead to better quality articles and a lower likelihood of reporting and methodological deficiencies. Improved reporting is useful for the scientific community broadly, and there is also evidence that adherence to reporting guidelines can improve citation rates[5]. For peer reviewers, the RIPL checklist provides a simple method for assessing the completeness of the article and may highlight important deficiencies or areas where authors may improve the article[6]. I have used the checklist for this purpose and found it to be a useful aid.

1.3 Use in Government and Policy

Patent landscapes are often produced by governments or patent offices. The UK government, for example, has published around 30 landscapes in the last 10 years[7]. Such studies may aim to determine future funding directions and levels of innovation[8] or even examine gender equality[9] and, as such, may have significant implications. Therefore, as with academic publications, the ability for independent researchers or other stakeholders to critically appraise and replicate the work is important. The RIPL checklist can be used in this context by organisations to ensure that key items are reported for the benefit of readers, to increase standardisation and as an internal quality check of important methodological details that are often overlooked. As in academia, it can be used by the authors in the planning and writing stage, and may be used by editors involved in the publication of the report for quality checks.

1.4 Use in Industry

Though there are few commercial patent landscapes available publicly to evaluate (https://www.wipo.int/patentscope/en/programs/patent_landscapes/plrdb.html), it seems likely that RIPL can be used for many of the same purposes in industry that it can be used

for in academia or policy. When producing a landscape, researchers can consult the checklist to improve reporting quality. Peers, or other companies that may have commissioned the report, can then use RIPL as an initial quality check to ensure that the minimally required information is presented, before evaluating the report in more detail in the context of its specific purpose. If landscapes need to be updated, or different technologies investigated using similar methods, increased reporting quality could lead to greater efficiency through less duplicated effort.

1.5 Methodological Guidelines

Importantly, though RIPL may help to improve methodologies, it is focussed on reporting. Other resources are available to provide methodological guidance for patent landscapes. In particular, the World Intellectual Property Organization (WIPO) has developed two guidelines: “Guidelines for preparing Patent Landscape Reports”[10] and “WIPO Manual on Open Source Tools for Patent Analytics”[11], which are valuable documents to use in conjunction with the RIPL checklist when planning, conducting and writing patent landscape reports.

1.6 Towards Reproducible Patent Landscaping

RIPL focusses largely on completeness of reporting in the article, though in many other research areas there is an increasing emphasis on providing other materials needed to fully reproduce and evaluate results, such as raw data, analytical pipelines, or preregistered protocols[12]. Though RIPL recommends publishing the list of patent publications used in the study (Item 15), we did not make any statements about availability of code for analysis or protocols. The use of proprietary software in patent landscape analyses is prevalent (e.g.[13,14]), and such software i) cannot be accessed by most readers and ii) generally involves ‘point and click’ analysis, rather than reproducible code which others could re-run. It is often not possible, therefore, to publish the analysis with the paper. As the use of open source tools, such as R (a commonly used open source statistical software, recommended, for example, in ref [11]) increases, publishing code used alongside reports would be valuable. Increased use of such tools with open code could significantly improve the ability to understand the decisions that researchers made during analysis, which cannot always be easily recalled and detailed in a paper with content or length restrictions.

Registering or publishing protocols for clinical trials[15] and systematic reviews of clinical studies[16] has been common practice for many years. Protocol registration involves depositing or publishing the plan for research prior to commencing the work, which addresses a number of general issues related to reproducibility[17]. It is increasingly used and recommended outside of clinical trials, for example in observational research[18] or psychological studies[19]. I am not aware of any protocol registrations for published patent landscape articles. However, protocol registration could be valuable for minimising bias and encouraging researchers to think through analytical and methodological decisions *a priori*. It may also lead to better definition and consideration of the purpose of the landscaping exercise, thereby increasing the value of research produced. Platforms such as the open science framework (<https://osf.io/>) allow flexible registration of a variety of study types and would be suitable for patent landscapes.

1.7 Conclusion

This article has highlighted that RIPL may be useful for a variety of stakeholders involved in patent landscaping and made suggestions for improving reproducibility and transparency beyond reporting quality in the report. New methods of analysis may become common and different features may be added to patent databases. As these developments occur, continued evaluation of the checklist will be required to determine its effectiveness and ensure that it reflects best and current practices. The suitability of other measures proposed in this paper should also be explored.

1.8 References

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