

Research Outputs in Luxembourg

Table of contents

1 Introduction	1
2 Exploring the Data: Understanding Luxembourg's Research Output in OpenAlex	1

1 Introduction

For this study, data from OpenAlex is used to assemble a comprehensive corpus of scientific works affiliated with Luxembourg. OpenAlex is an open, transparent, and freely accessible scholarly metadata platform that aggregates detailed information on publications, authors, institutions, funding, and collaborations across all academic disciplines.

Its inclusive coverage and up-to-date data make OpenAlex an ideal resource for evidence-based policy analysis and strategic decision-making in research and higher education. By leveraging OpenAlex, this study ensures a broad and reliable overview of Luxembourg's research output, enabling the Ministry of Research and Higher Education to accurately assess national strengths, collaboration patterns, and areas for future investment.

However, it is important to note that OpenAlex's coverage, while extensive, is not yet fully comprehensive for Luxembourg. Some publications, especially those from smaller institutions, less internationally visible disciplines, or published in languages other than English may be underrepresented. Given the complexity of scholarly publishing and data aggregation, it is difficult to precisely identify all gaps or biases in the data. This uncertainty should be considered when interpreting the findings and formulating policy recommendations.

2 Exploring the Data: Understanding Luxembourg's Research Output in OpenAlex

The scope of this study are the scholarly works from the last 10 years. The following table shows the distribution of type of works and whether they have a DOI or not:

Type	Has DOI	DOI missing	Total
article	24320	9755	34075
book	267	89	356
book-chapter	2982	54	3036
dataset	878	0	878
dissertation	35	52	87
editorial	190	1	191
erratum	102	0	102

Type	Has DOI	DOI missing	Total
letter	232	1	233
other	92	80	172
paratext	145	8	153
peer-review	155	0	155
preprint	1829	1363	3192
reference-entry	23	0	23
report	88	21	109
review	1382	20	1402

Because the majority of works are articles, this study is going to focus on articles only, regardless of whether they have a DOI or not.

is_lu_first_author	n	percent
FALSE	12411	0.364226
TRUE	21664	0.635774

primary_domain_name	FALSE	TRUE
Health Sciences	2729	1884
Life Sciences	1519	1347
MISSING-DOMAIN	62	462
Physical Sciences	5340	8120
Social Sciences	2761	9851

To provide a solid foundation for analysis, it is crucial first to understand the scope and composition of the dataset extracted from OpenAlex. This section presents key descriptive statistics that characterize Luxembourg’s scientific output captured in the data.

Total Number of Works The dataset includes all documented research works affiliated with Luxembourgish institutions or authors over the study period. This total volume provides a baseline for assessing the country’s overall scientific productivity.

Works by Luxembourg Institutions Breaking down the dataset by institution allows us to identify the main contributors within Luxembourg’s research ecosystem. This includes major universities, research institutes, and other organizations based in the country, highlighting their relative publication activity.

Works with Primary Luxembourgish Authors In addition to institutional affiliation, the nationality or primary affiliation of the lead authors provides insight into the domestic research capacity.

We examine the number and share of works where the primary or corresponding author is Luxembourgish, which helps distinguish between research led locally versus research involving Luxembourg through collaboration.

These basic metrics help frame further analysis, such as collaboration patterns, disciplinary strengths, and research impact, by clarifying what the data contains and its coverage limits.