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Report on research publications co-authored by Japan and UK based on the Scopus database

Japan Society for the Promotion of Science (JSPS)
London Office

Summary

Analysis of the Scopus database shows that the number of UK-Japan joint publications has been steadily increasing since 2000, but the proportion with Japan as a co-author country in the number of the UK's international joint publications has been slightly decreasing. However, UK-Japan joint publications have maintained a high citation ranking compared to other international joint publications.

1. Introduction

Research collaboration between Japan and the UK has been strengthened through a variety of programmes provided by JSPS and other funding organizations. Joint publications co-authored by Japanese and UK researchers are one of the research collaboration outcomes. This report reveals the outline of UK-Japan joint publications using the Scopus database and provides numerical evidence of UK-Japan research collaboration.

2. Methodology and definition

This report is based on data sets for joint publications between the UK and each co-author country which were exported from Scopus in September 2016. SciVal, an online tool based on the Scopus database, was also used for the analysis of citations.

In this report, the search (or filter) for the export on Scopus provides a definition of international joint publications. For example, a 'UK-Japan joint publication' means a publication whose co-authors include both at least one author whose affiliation is located in Japan and at least one author whose affiliation is located in the UK. Therefore, a UK-Japan joint publication may have a third or more countries as its co-authors. The country of the author's affiliation, not the author's nationality has been counted. Publications include all publication types included in Scopus, e.g. articles and reviews of academic journals, conference papers, and book chapters. Citations include self-citations. The research field of a publication is determined by the journal in which it is published, and a publication may be categorized into two (or more) research fields if the journal itself covers two (or more) research fields.[1]

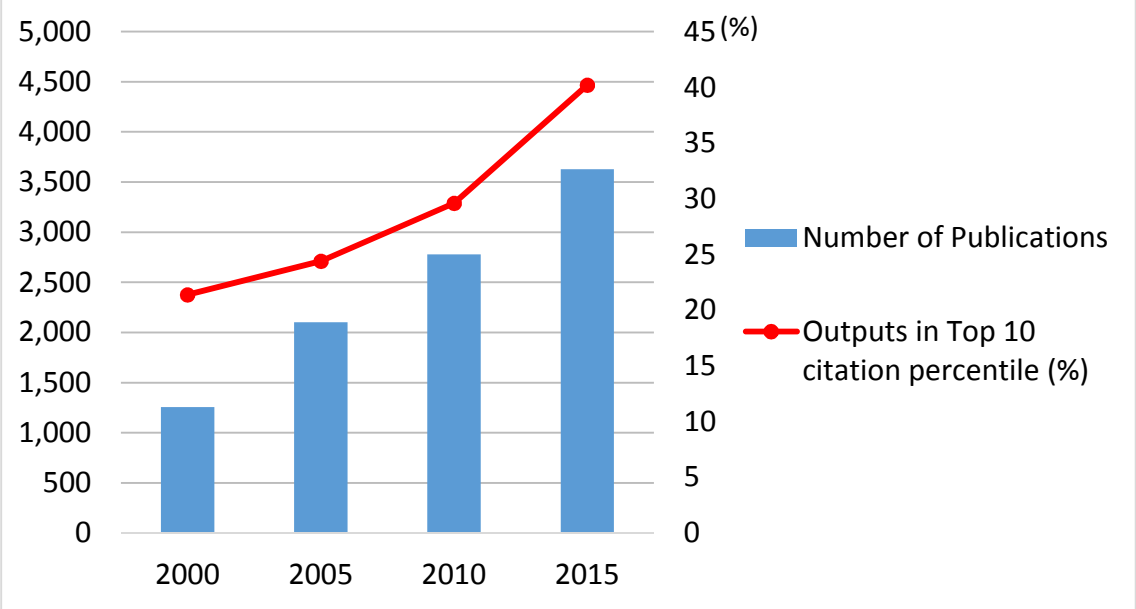
[1] Detailed information on the search and definitions can be found from the following websites of Scopus and SciVal.
https://www.elsevier.com/solutions/scopus
https://www.elsevier.com/solutions/scival

3. Key findings

3.1. Trends in numbers and citations of UK-Japan joint publications

As shown in Figure 1, since 2000, UK-Japan joint publications have increased steadily in number and outputs in the top 10 citation percentile. The top 10 citation percentile refers to how many UK-Japan joint publications are ranked in the top 10% of the most-cited publications in the world. For example, in 2015 about 40% of UK-Japan joint publications are ranked in the top 10% of the world citation rankings.[2]

Figure 1
Number and outputs in top 10 citation percentile of UK-Japan joint publications since 2000



Data source: Scopus

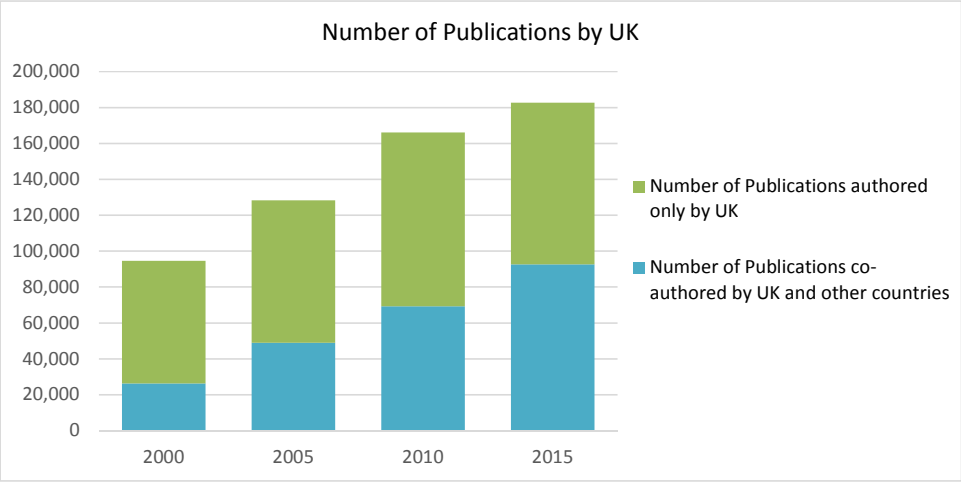
3.2. Number of UK-Japan joint publications and its share

Figure 2.1 shows the number of publications by UK researchers, both international joint publications (shown in blue) and national ones (shown in green), and the share of co-author countries of the UK's international joint publications. Japan has been ranked down from 9th place in 2000 to 13th in 2015, overtaken by China, Switzerland, Sweden and Belgium, although the number of UK-Japan joint publications has increased.

Figure 2.2 shows those for Japan. For Japan, the UK maintains 4th place in 2015.

[2] SciVal Metrics Guidebook provides comprehensive information of outputs in the top 10 citation percentile and other metrics.
https://www.elsevier.com/__data/assets/pdf_file/0020/53327/scival-metrics-guidebook-v1_01-february2014.pdf

Figure 2.1 Number of publications by UK researchers and share ranking of UK's co-author countries

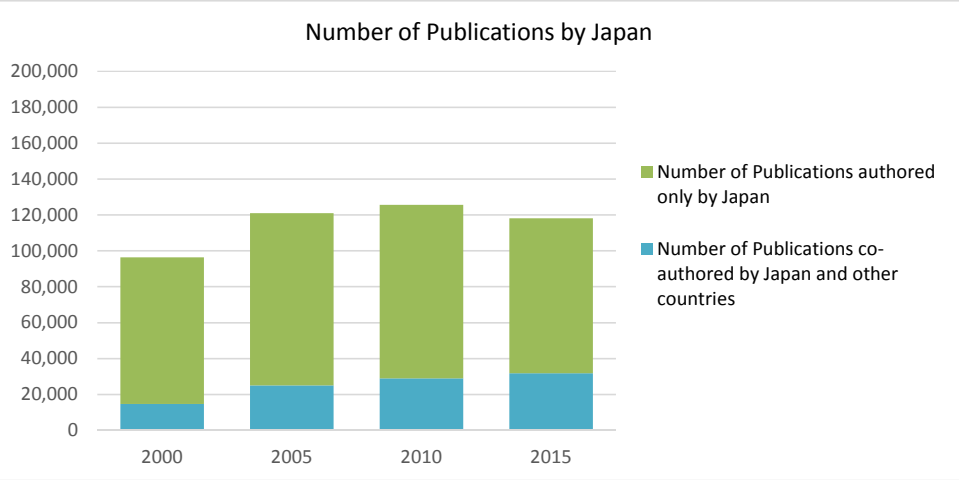


Co-author countries of UK's international publications

	Published in 2000			2005			2010			2015		
1	United States	8,122	30.9%	United States	15,327	31.4%	United States	20,642	29.8%	United States	27,314	29.5%
2	Germany	3,402	12.9%	Germany	6,900	14.1%	Germany	10,484	15.1%	Germany	14,413	15.6%
3	France	2,785	10.6%	France	5,214	10.7%	France	7,510	10.8%	France	10,123	10.9%
4	Italy	2,036	7.7%	Italy	4,008	8.2%	Italy	6,463	9.3%	Italy	9,878	10.7%
5	Netherlands	1,719	6.5%	Netherlands	3,414	7.0%	Australia	5,648	8.2%	Australia	9,230	10.0%
6	Canada	1,498	5.7%	Australia	3,396	6.9%	Netherlands	5,636	8.1%	China	9,092	9.8%
7	Australia	1,483	5.6%	Canada	3,359	6.9%	Spain	5,202	7.5%	Netherlands	8,088	8.7%
8	Spain	1,331	5.1%	Spain	2,858	5.8%	Canada	4,987	7.2%	Spain	7,831	8.5%
9	Japan	1,289	4.9%	Switzerland	2,301	4.7%	China	4,620	6.7%	Canada	6,742	7.3%
10	Switzerland	1,087	4.1%	Japan	2,105	4.3%	Switzerland	3,665	5.3%	Switzerland	5,718	6.2%
11	Sweden	1,021	3.9%	Sweden	2,093	4.3%	Sweden	3,190	4.6%	Sweden	5,002	5.4%
12	Belgium	855	3.3%	China	2,045	4.2%	Japan	2,796	4.0%	Belgium	4,202	4.5%
13	Russian Federation	845	3.2%	Belgium	1,704	3.5%	Belgium	2,757	4.0%	Japan	3,664	4.0%
14	Denmark	763	2.9%	Denmark	1,324	2.7%	Denmark	2,063	3.0%	Denmark	3,610	3.9%
15	China	612	2.3%	Russian Federation	1,321	2.7%	Ireland	1,954	2.8%	Brazil	2,696	2.9%
16	Ireland	575	2.2%	Ireland	1,244	2.5%	Greece	1,730	2.5%	Norway	2,649	2.9%
17	Greece	571	2.2%	Greece	1,074	2.2%	Austria	1,668	2.4%	Greece	2,636	2.8%
18	Brazil	509	1.9%	Norway	1,044	2.1%	Norway	1,594	2.3%	India	2,544	2.7%
19	Finland	504	1.9%	New Zealand	1,000	2.0%	Finland	1,530	2.2%	Austria	2,538	2.7%
20	Poland	490	1.9%	Finland	995	2.0%	India	1,471	2.1%	Ireland	2,487	2.7%

Data source: Scopus

Figure 2.2 Number of publications by Japanese researchers and share ranking of Japan's co-author countries



Co-authors of Publications by Japan

	Published in 2000			2005			2010			2015		
1	United States	6,208	42.7%	United States	9,734	39.0%	United States	9,938	34.4%	United States	10,329	32.4%
2	Germany	1,426	9.8%	China	3,448	13.8%	China	5,025	17.4%	China	6,280	19.7%
3	United Kingdom	1,275	8.8%	Germany	2,260	9.1%	Germany	2,956	10.2%	Germany	3,700	11.6%
4	China	1,212	8.3%	United Kingdom	2,103	8.4%	United Kingdom	2,796	9.7%	United Kingdom	3,664	11.5%
5	France	855	5.9%	South Korea	1,726	6.9%	South Korea	2,224	7.7%	France	2,686	8.4%
6	Canada	757	5.2%	France	1,603	6.4%	France	2,168	7.5%	South Korea	2,342	7.4%
7	South Korea	704	4.8%	Canada	1,291	5.2%	Canada	1,519	5.3%	Australia	2,002	6.3%
8	Russian Federation	673	4.6%	Australia	1,012	4.1%	Italy	1,293	4.5%	Italy	1,878	5.9%
9	Australia	489	3.4%	Russian Federation	1,001	4.0%	Australia	1,283	4.4%	Canada	1,814	5.7%
10	Italy	455	3.1%	Italy	926	3.7%	Taiwan	1,005	3.5%	Spain	1,431	4.5%
11	India	362	2.5%	India	775	3.1%	India	978	3.4%	India	1,340	4.2%
12	Sweden	338	2.3%	Switzerland	620	2.5%	Spain	911	3.2%	Switzerland	1,315	4.1%
13	Switzerland	331	2.3%	Netherlands	556	2.2%	Switzerland	905	3.1%	Taiwan	1,304	4.1%
14	Netherlands	321	2.2%	Sweden	540	2.2%	Netherlands	810	2.8%	Netherlands	1,138	3.6%
15	Poland	259	1.8%	Taiwan	502	2.0%	Russian Federation	791	2.7%	Russian Federation	1,108	3.5%
16	Spain	204	1.4%	Spain	483	1.9%	Thailand	776	2.7%	Sweden	1,053	3.3%
17	Thailand	198	1.4%	Thailand	453	1.8%	Sweden	686	2.4%	Thailand	997	3.1%
18	Belgium	189	1.3%	Poland	445	1.8%	Belgium	536	1.9%	Malaysia	883	2.8%
19	Taiwan	185	1.3%	Belgium	371	1.5%	Malaysia	468	1.6%	Poland	763	2.4%
20	Israel	177	1.2%	Austria	310	1.2%	Austria	441	1.5%	Belgium	761	2.4%

Data source: Scopus

3.3. University ranking of UK-Japan joint publications

Figure 3 shows university ranking in the number of UK-Japan joint publications.[3] Since 2001, the University of Tokyo has always been top on the Japanese side and the University of Oxford, University of Cambridge and UCL have been the top three on the UK side. The difference between the top university and 14th university (the bottom in each graph) has been getting larger in Japan compared to the UK.

[3] In general, the number of publications primarily depends on the number of researchers (not only principle investigators, but also postdocs and PhD students) affiliated to each institute.

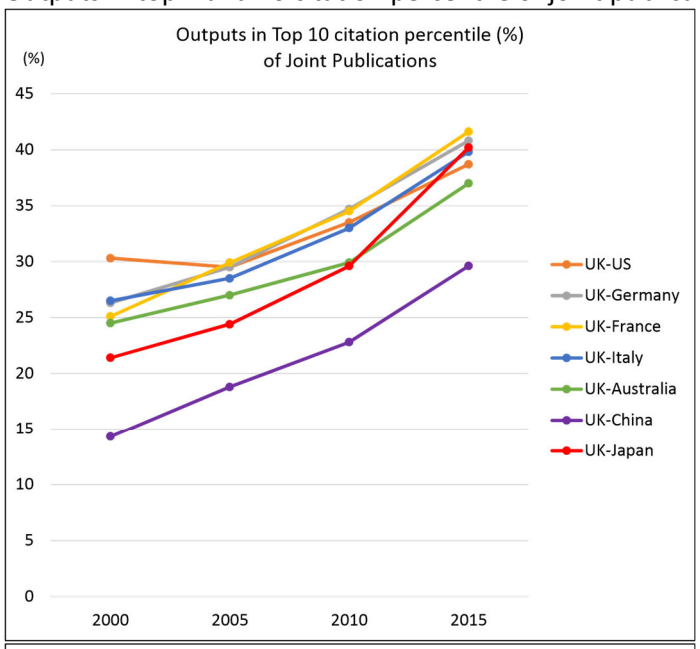
Figure 3 Number of UK-Japan joint publications by institutes

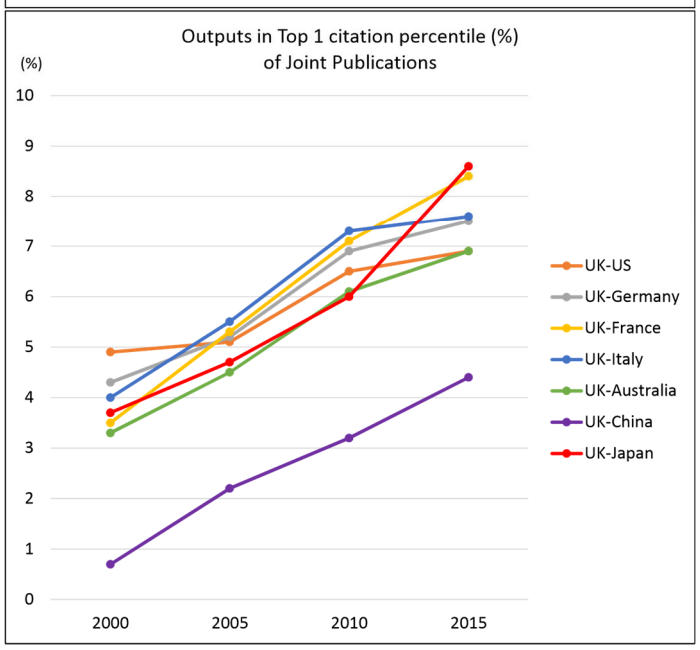
Data source: Scopus

3.4. Outputs in the Top 1 and 10 citation percentiles of UK-Japan joint publications

Figure 4.1 shows outputs in the top 1 and 10 citation percentiles of UK-Japan joint publications along with those by the UK and 6 other countries (US, Germany, France, Italy, Australia and China). These countries are the top 6 in terms of the number of joint publications with the UK in 2015 (Figure2.1). Among these countries, UK-Japan joint publications have remarkably increased in both outputs in top 1 and 10 citation percentiles, gaining the top ranking in terms of outputs in the top 1 citation percentile and 3rd place in terms of outputs in the top 10 citation percentile only after the number of joint publications between the UK and France and UK and Germany in 2015.

Figure 4.1
Outputs in top 1 and 10 citation percentile of joint publications since 2000

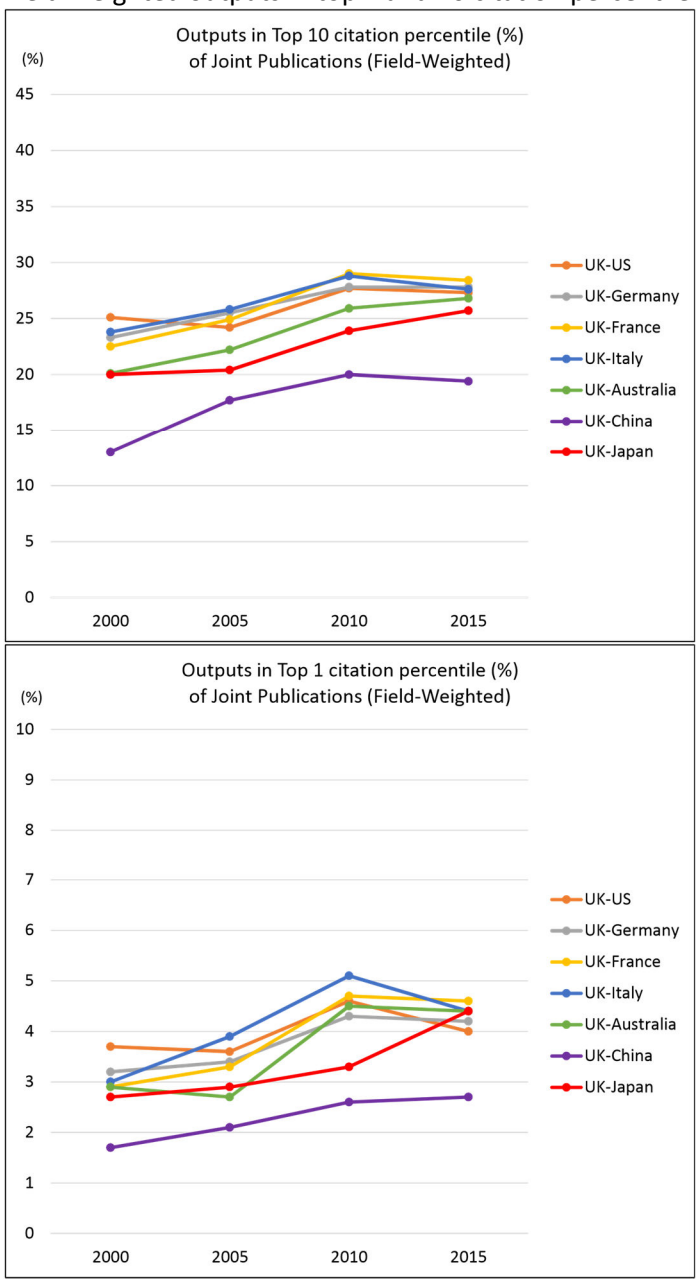




Data source: Scopus

Citation count is said to be influenced by research fields.[4] To reduce such field-depending influence, SciVal provides field-weighted index of outputs in the top 1 and 10 citation percentiles, as shown in Figure 4.2.[5] When field-weighted, UK-Japan joint publications still have remarkably increasing trends compared to other countries.

Figure 4.2
Field-weighted outputs in top 1 and 10 citation percentile of joint publications since 2000



Data source: Scopus

[4] According to SciVal Metrics Guidebook, 'Citation counts tend to be higher in disciplines such as immunology and microbiology, whose academics tend to publish frequently and include long reference lists, than in mathematics, where publishing 1 item every 5 years that refers to 1 or 2 other publications is common; these differences reflect the distinct behaviour of researchers in distinct subject fields, and not differences in performance'

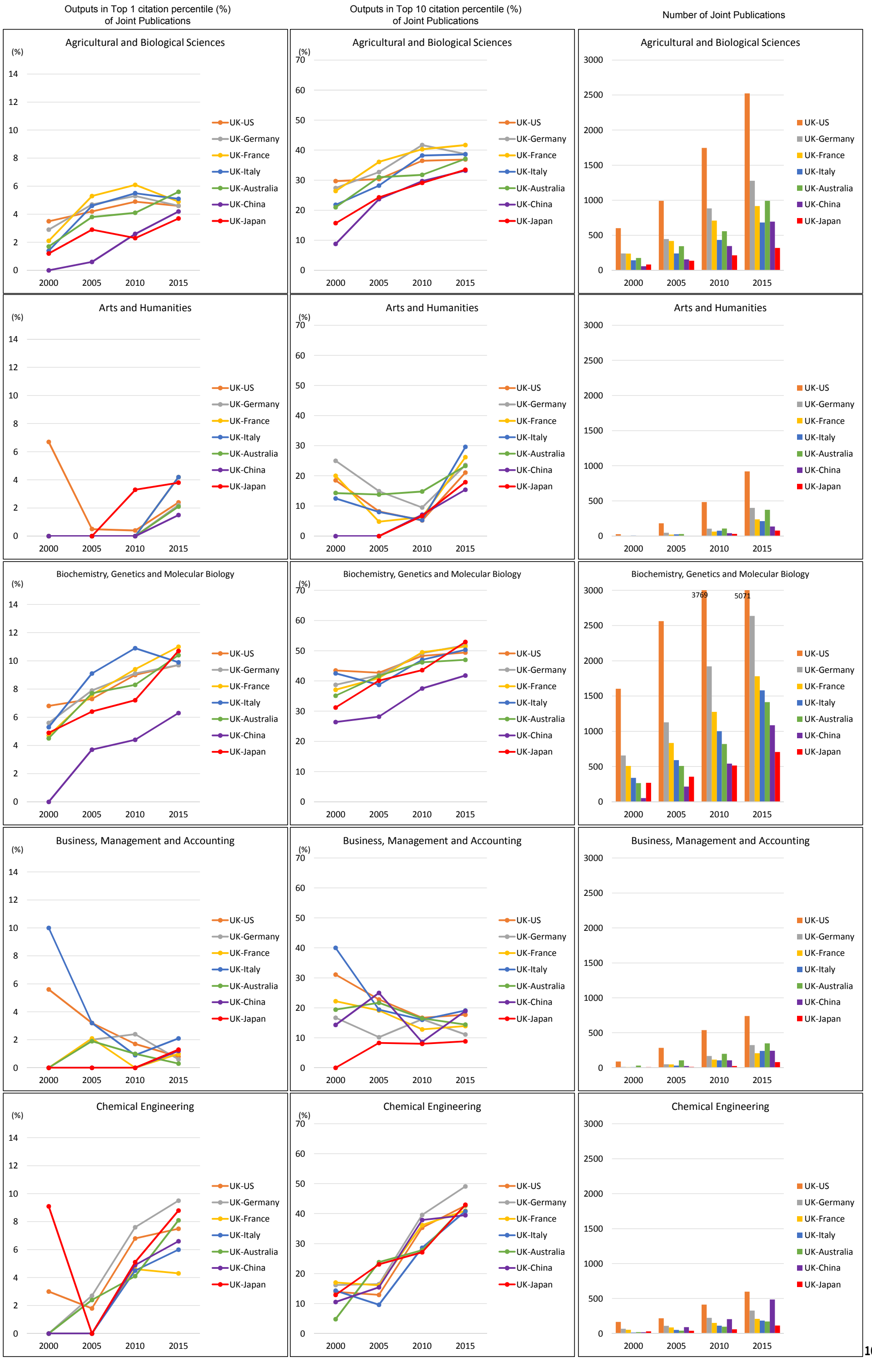
[5] However, calculation methods for field-weighted outputs in the top 1 and 10 citation percentiles are not provided by SciVal.

Figure 4.3 shows outputs in the top 1 and 10 citation percentile and the number of publications by each research field. UK-Japan joint publications perform highly in the top citation percentile especially in Biochemistry, Genetics and Molecular Biology, Earth and Planetary Sciences, Immunology and Microbiology, Medicine and Physics and Astronomy, when compared to other countries. At the same time, in these research fields, UK-Japan joint publications are relatively large in number.

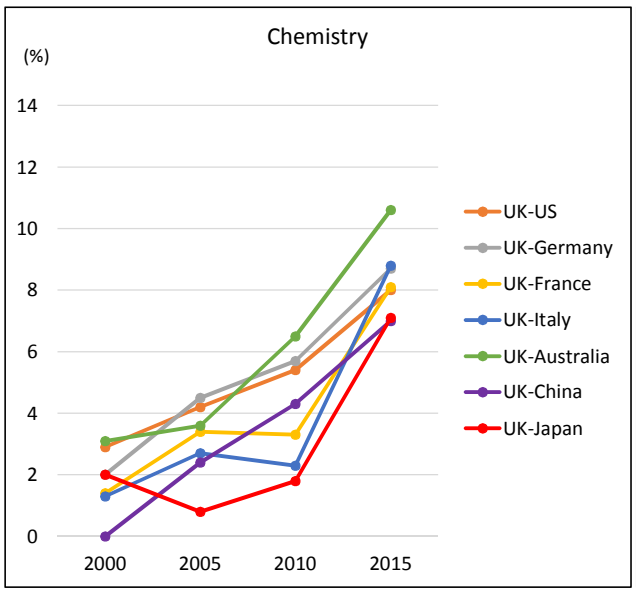
Citation count is field-dependant. Therefore a comparison of outputs in the top citation percentile between one research field and another is not meaningful. For example, UK-Japan joint publications have lower outputs in the top citation percentile in Mathematics than in Medicine, but this doesn't mean UK-Japan joint publications in Medicine have a higher performance ratio than those in Mathematics.

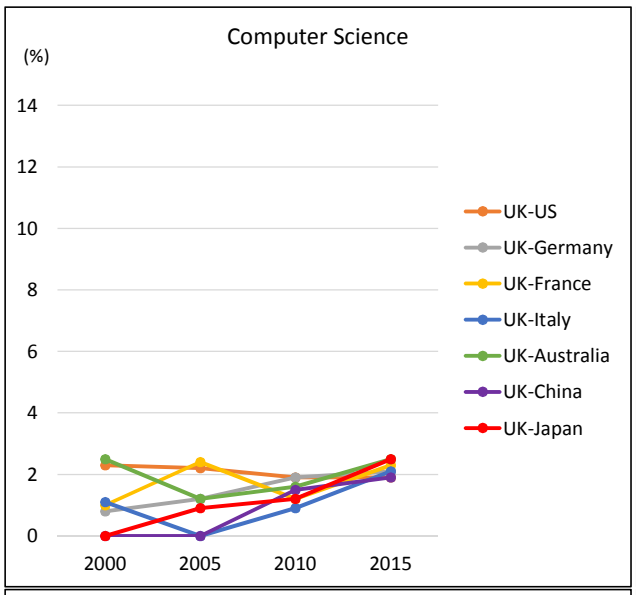
When the number of publications is very small, outputs in the top 1 and 10 citation percentile tend to fluctuate widely and don't provide statistical meanings.

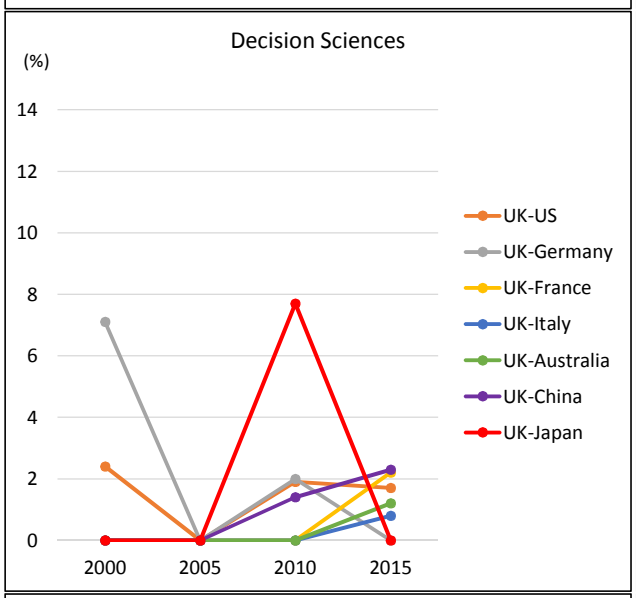
Figure 4.3 Outputs in top 1 and 10 citation percentile and number of joint publications by research field since 2000

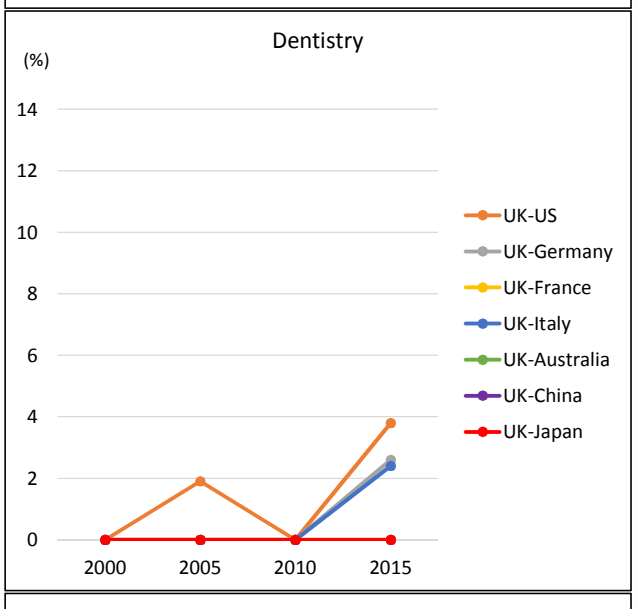


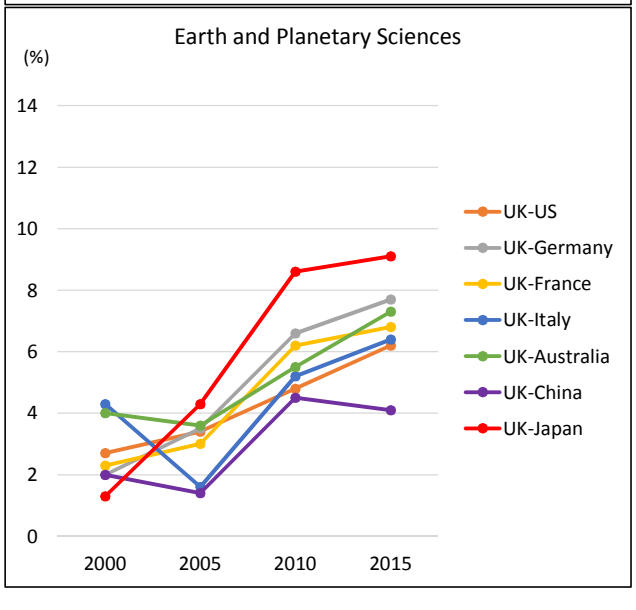
Outputs in Top 1 citation percentile (%) of Joint Publications



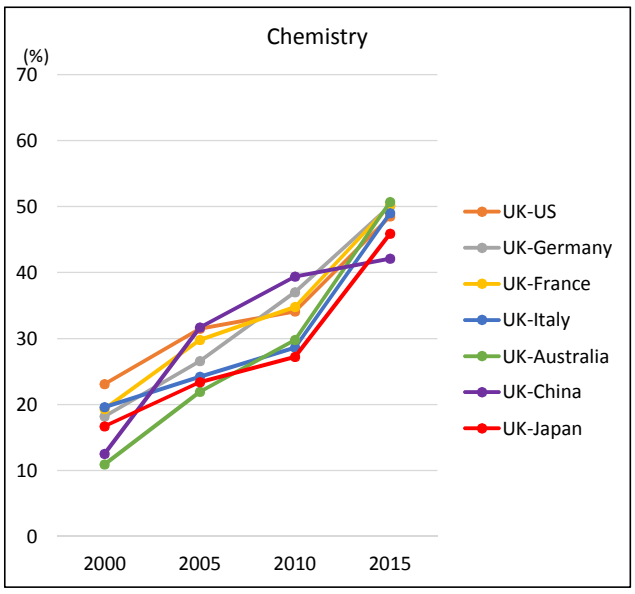


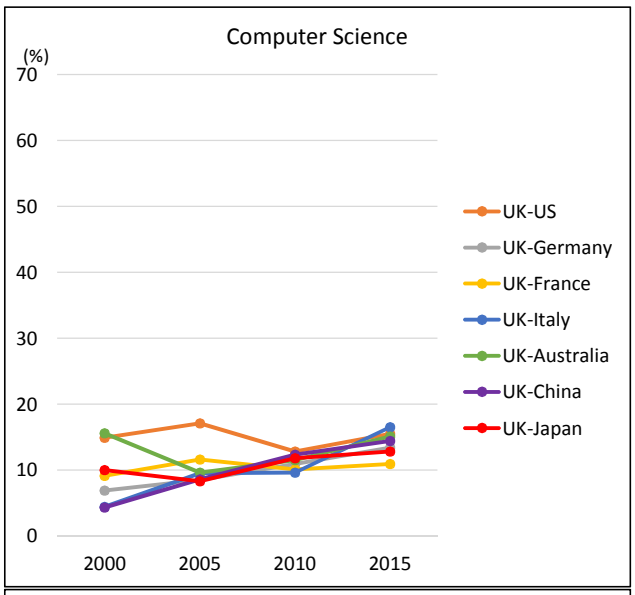


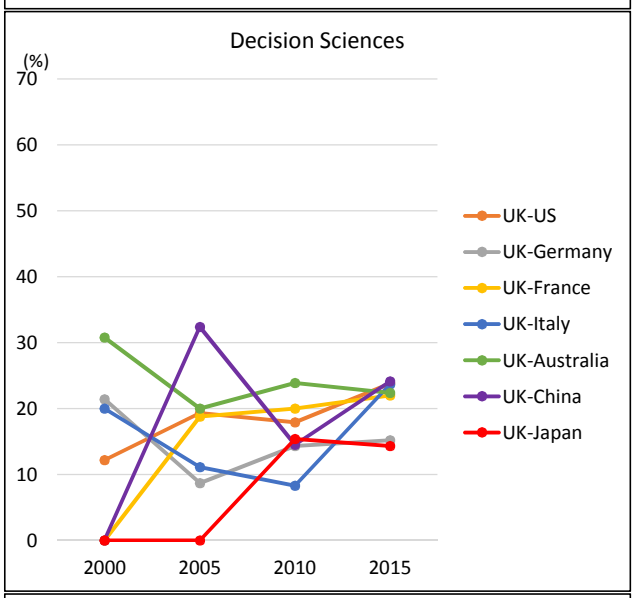


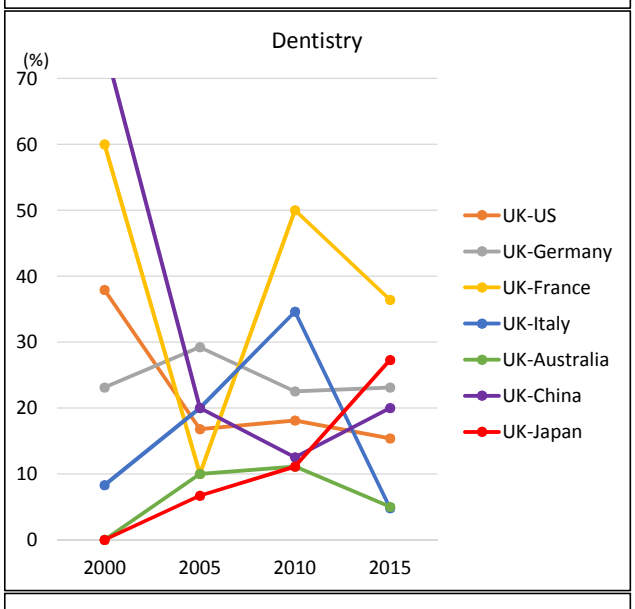


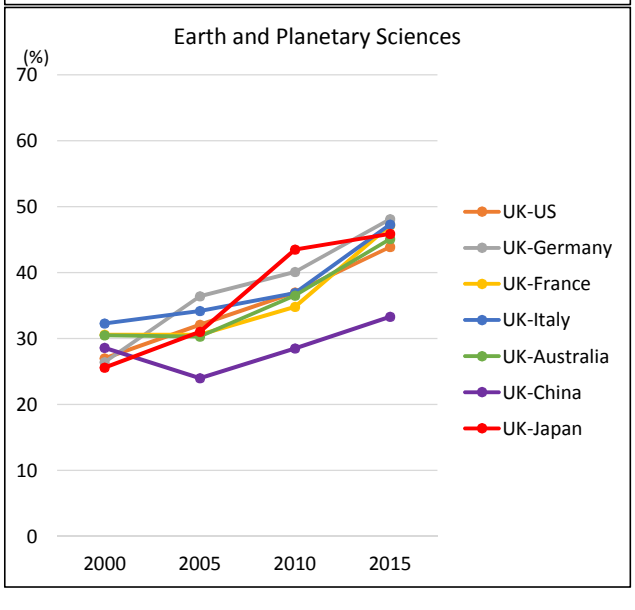
Outputs in Top 10 citation percentile (%) of Joint Publications



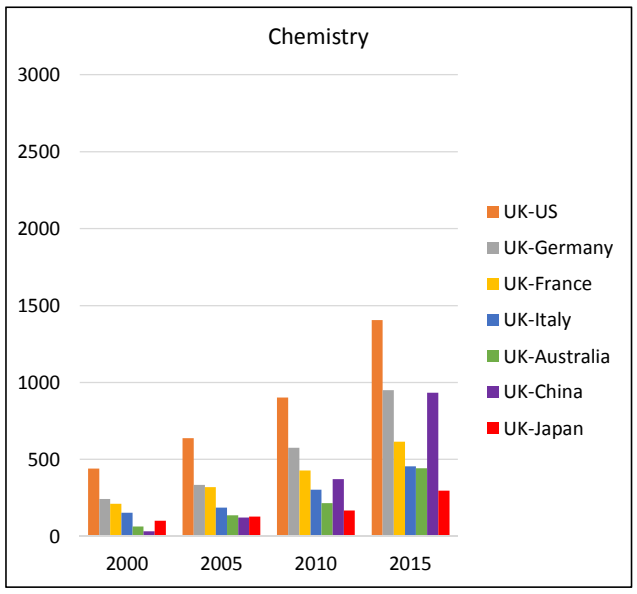


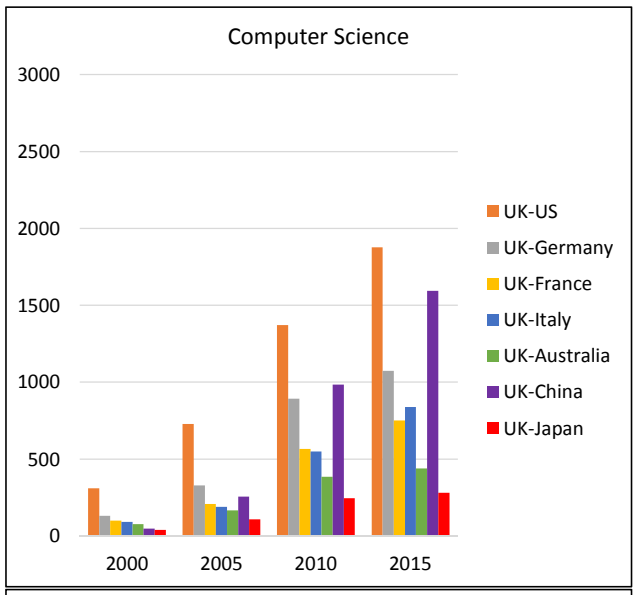


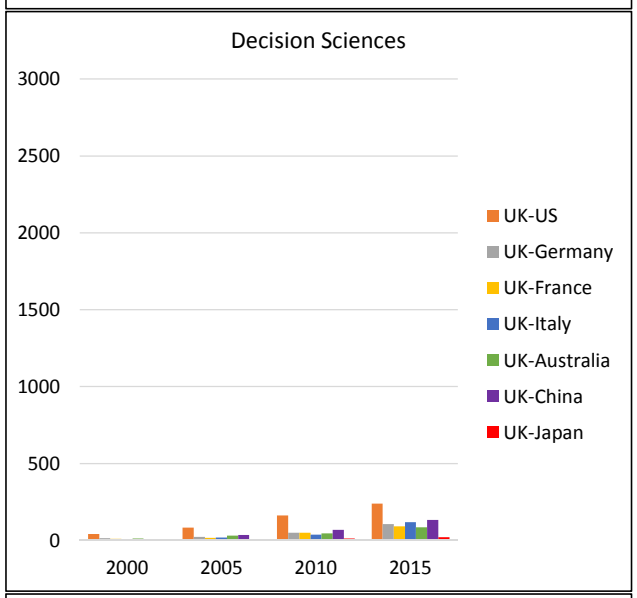


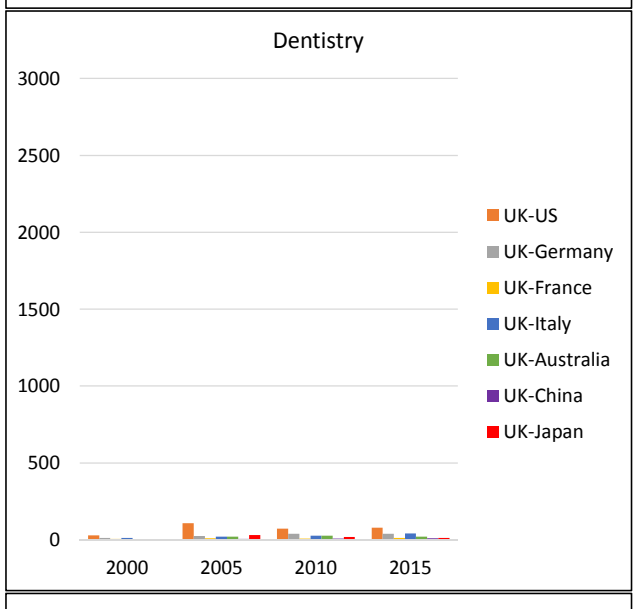


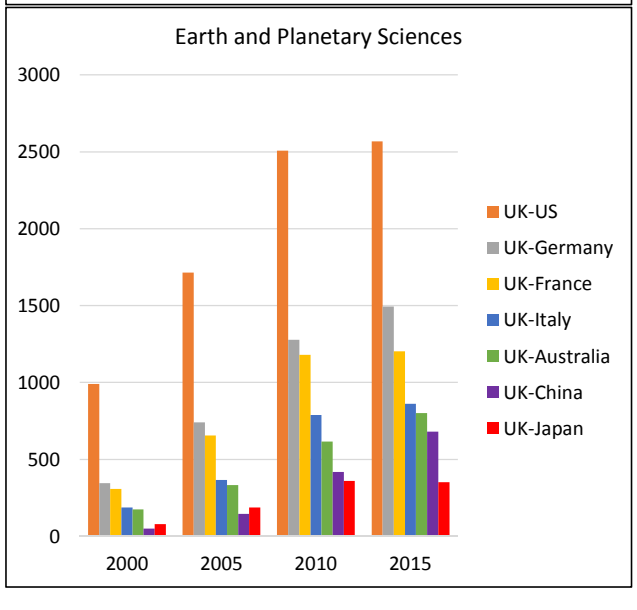
Number of Joint Publications



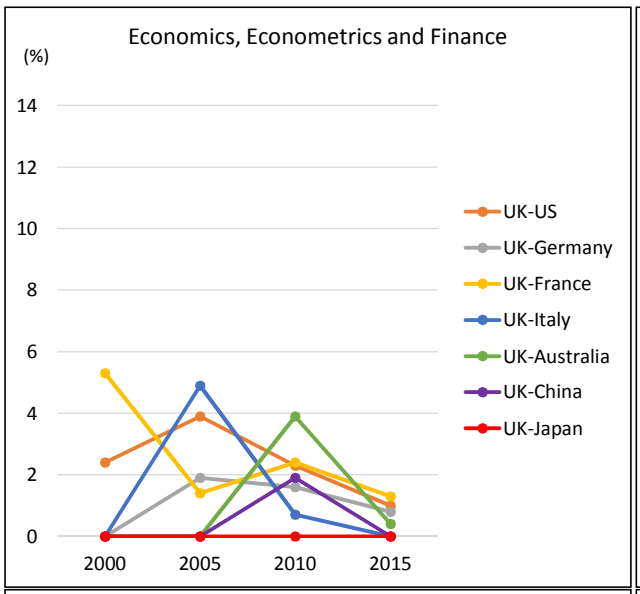


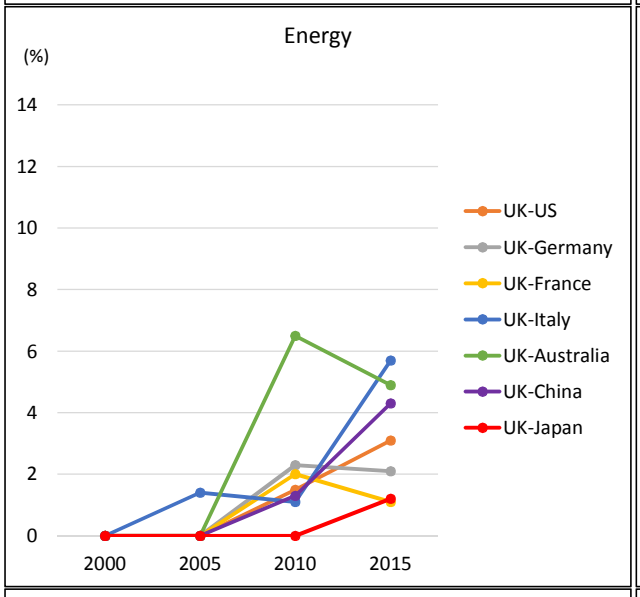


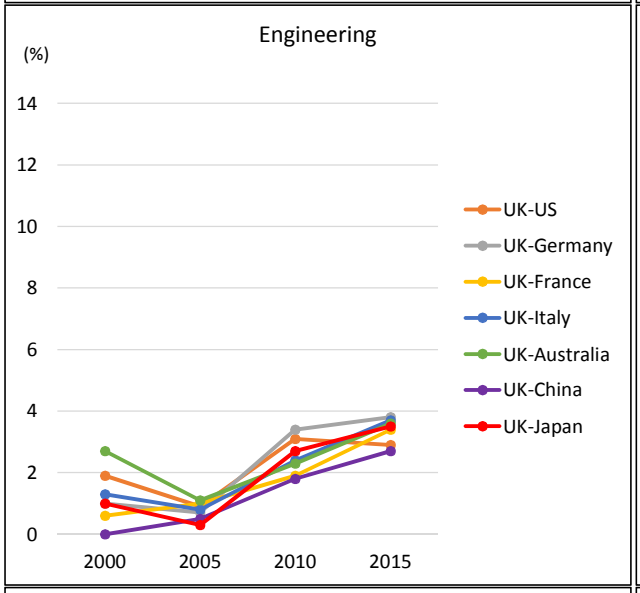


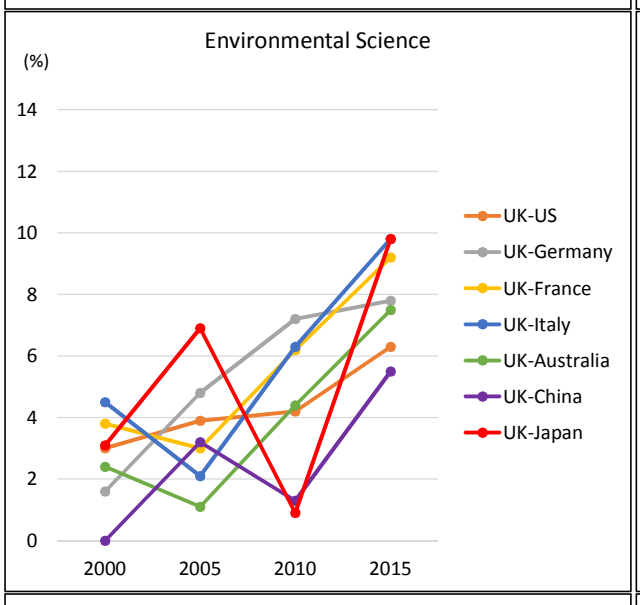


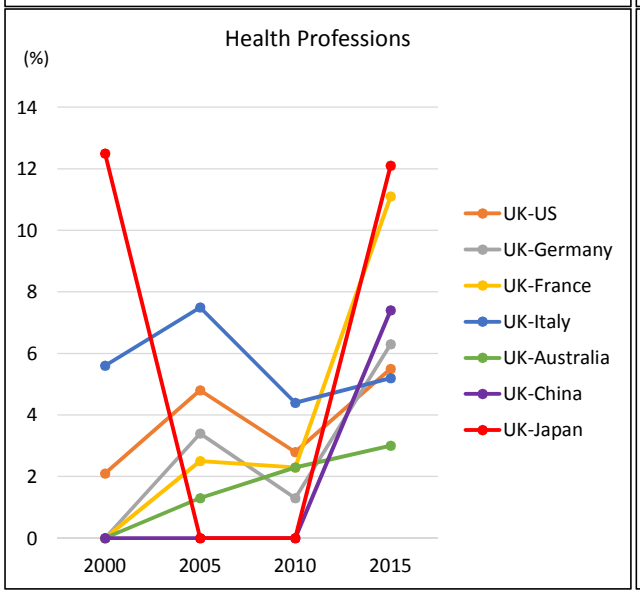
Outputs in Top 1 citation percentile (%) of Joint Publications



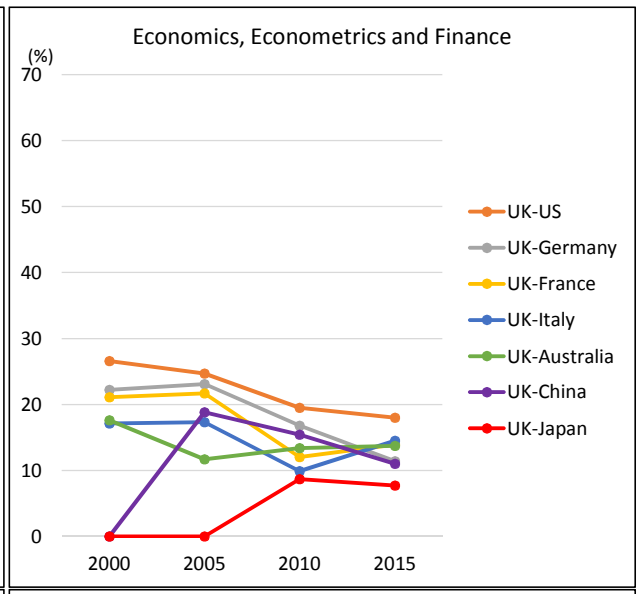


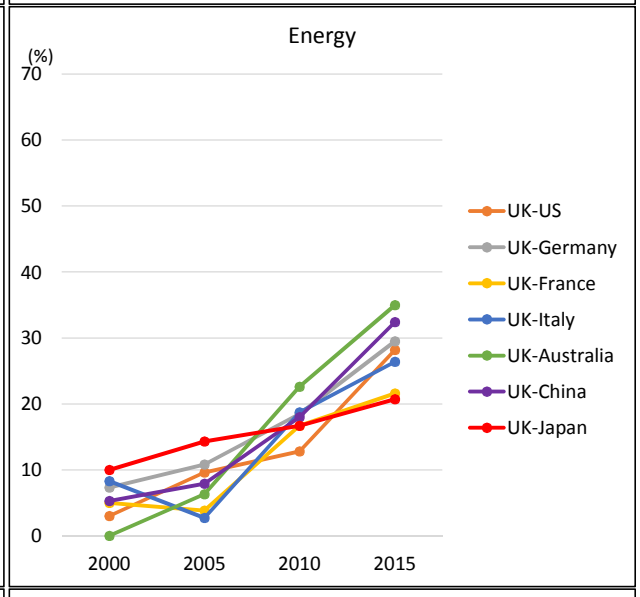


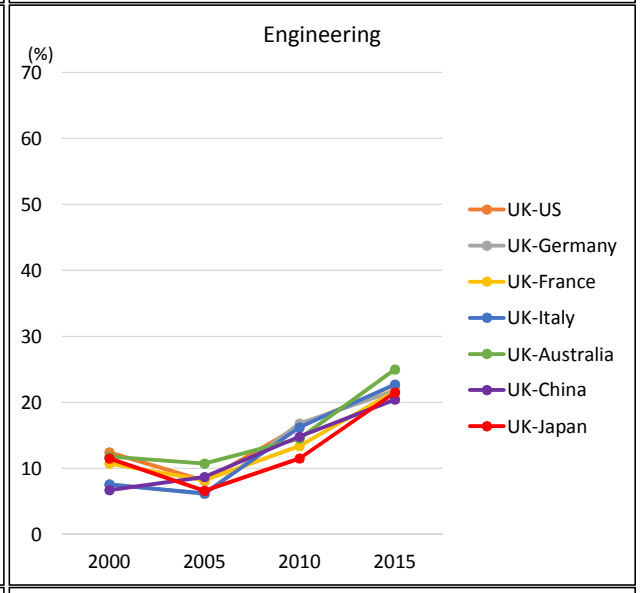


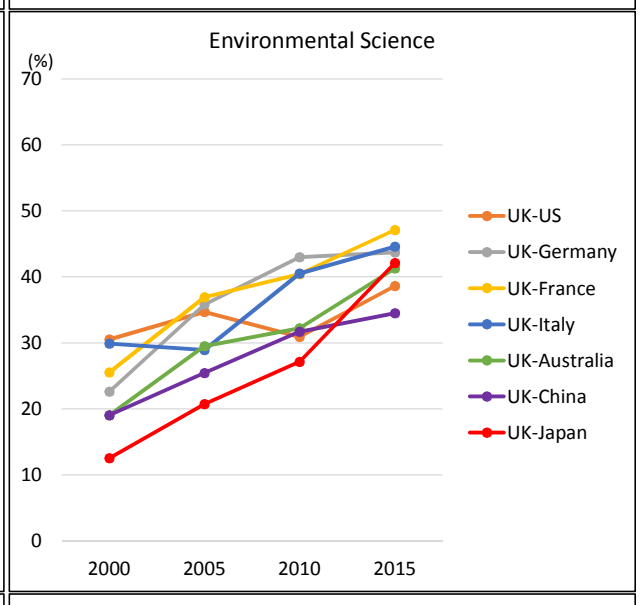


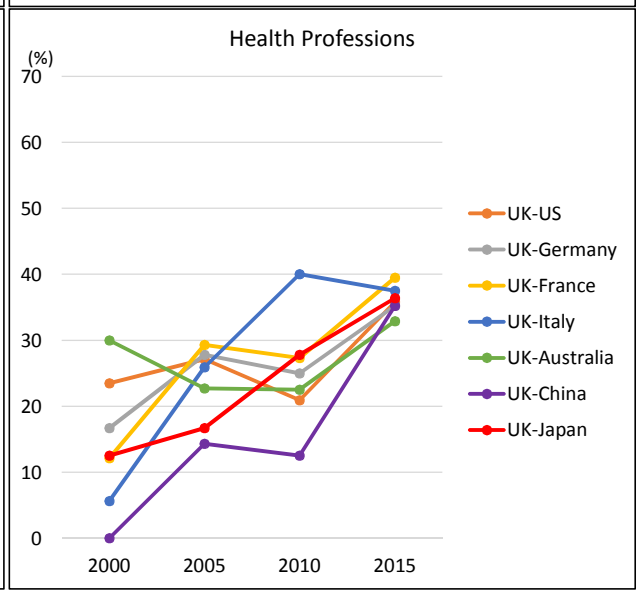
Outputs in Top 10 citation percentile (%) of Joint Publications



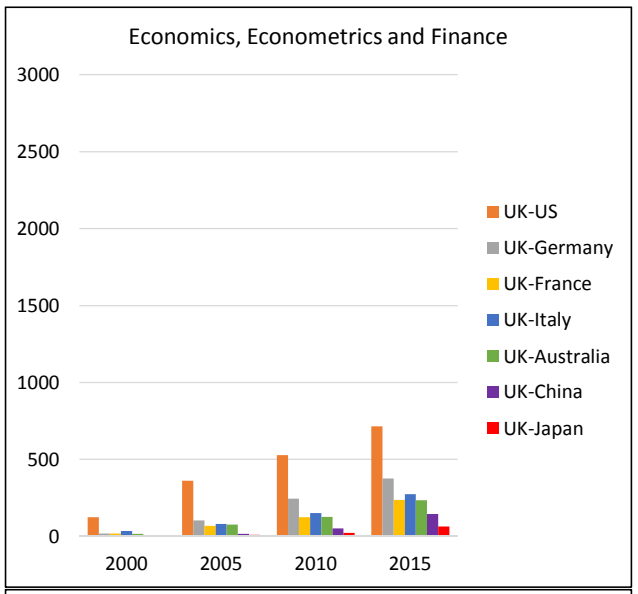


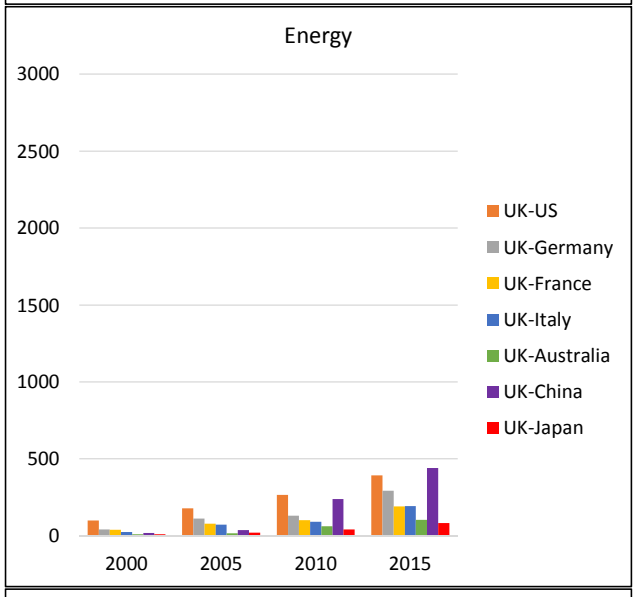


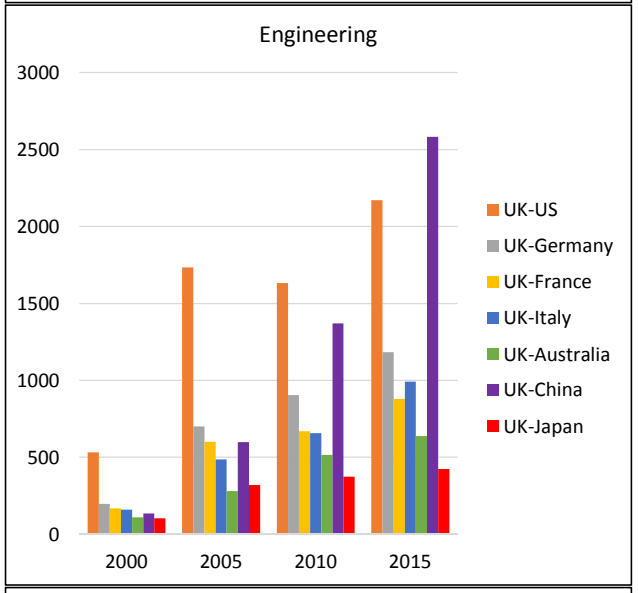


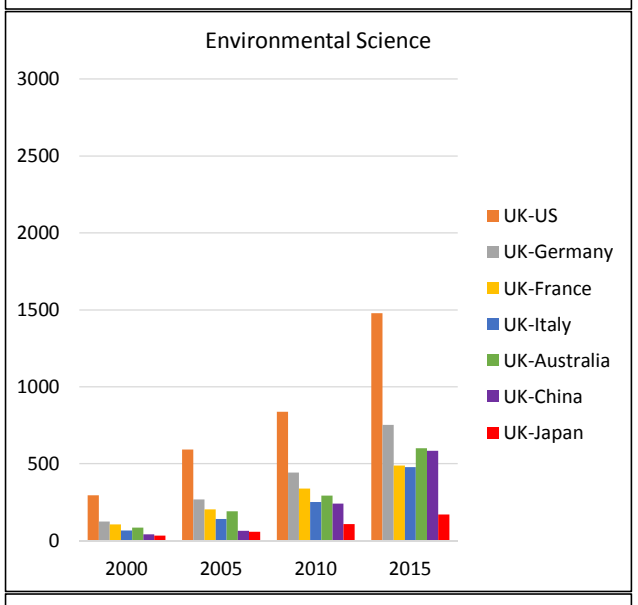


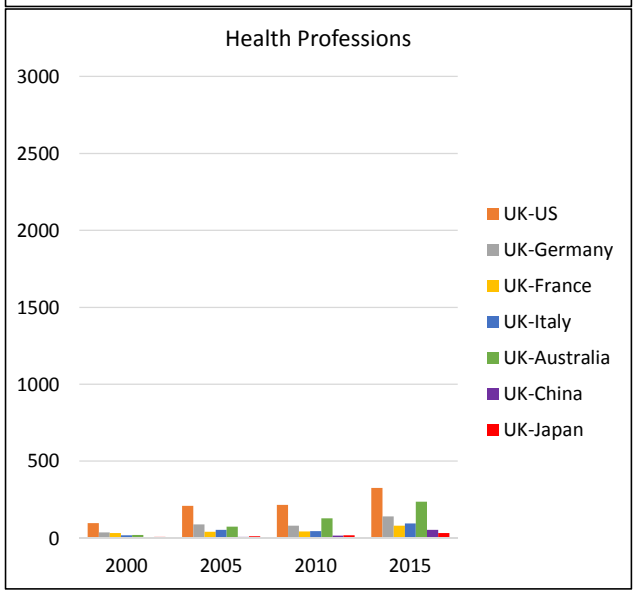
Number of Joint Publications



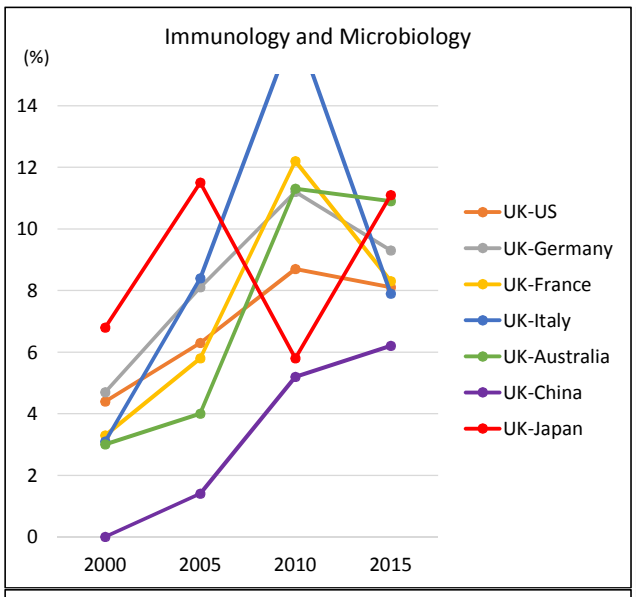


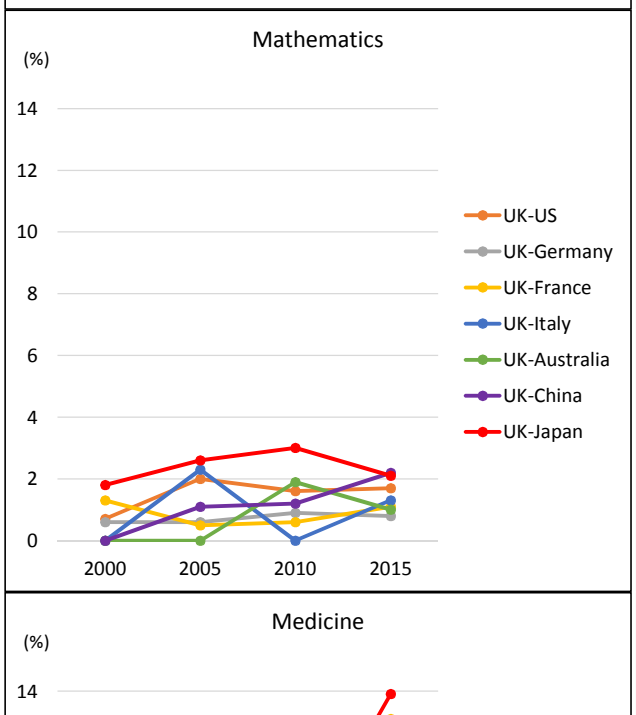


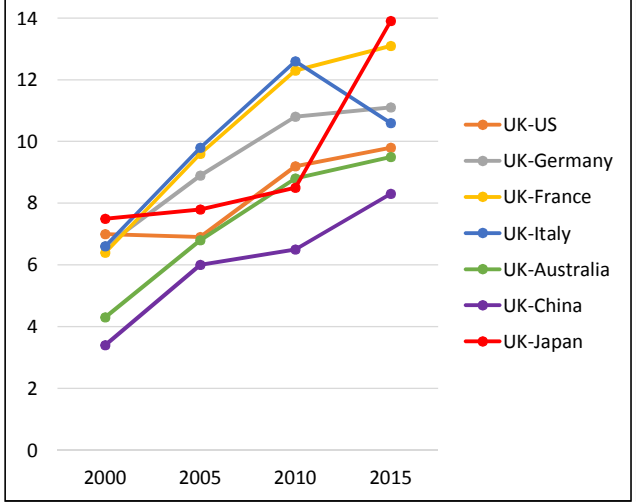


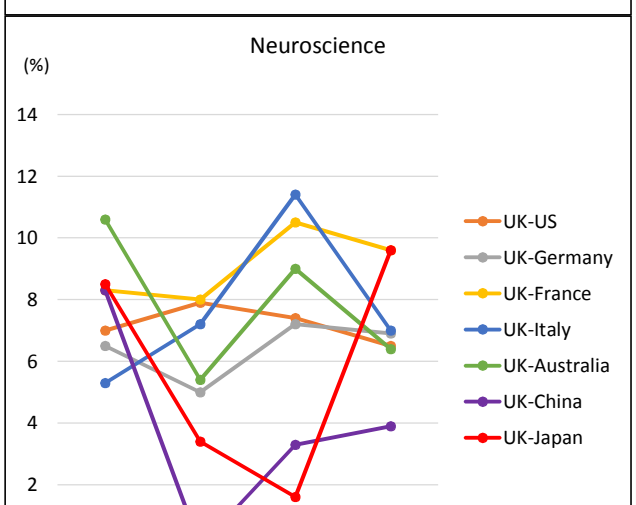


Outputs in Top 1 citation percentile (%) of Joint Publications

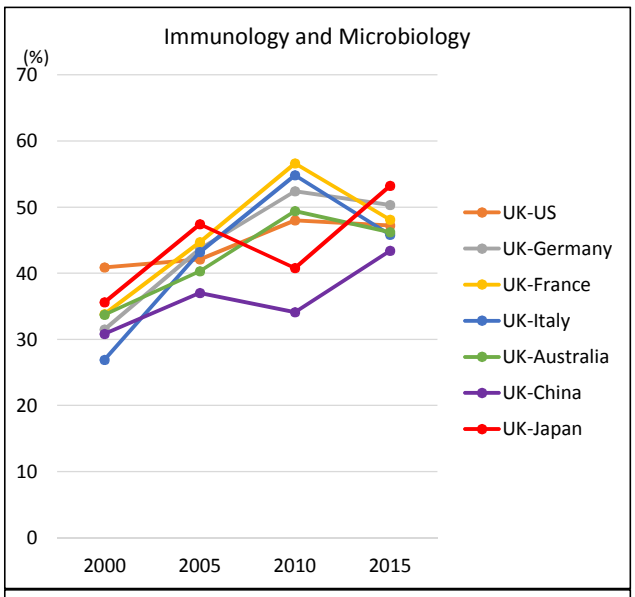


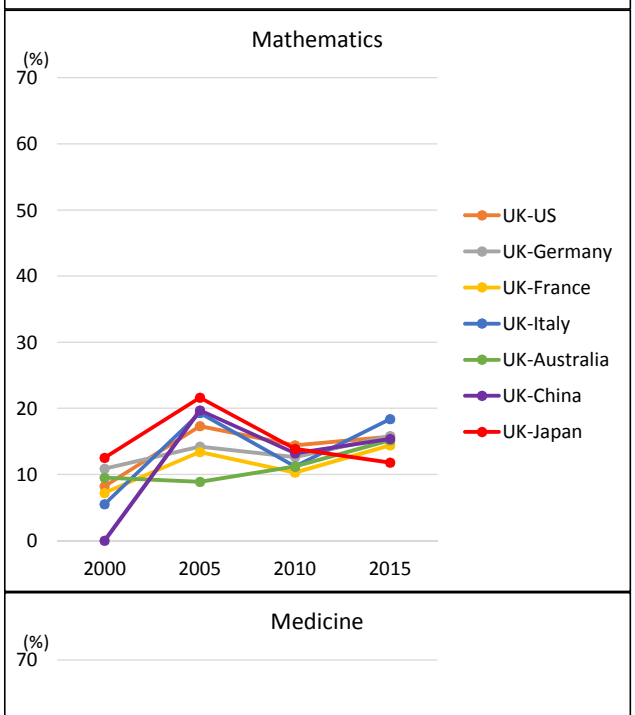


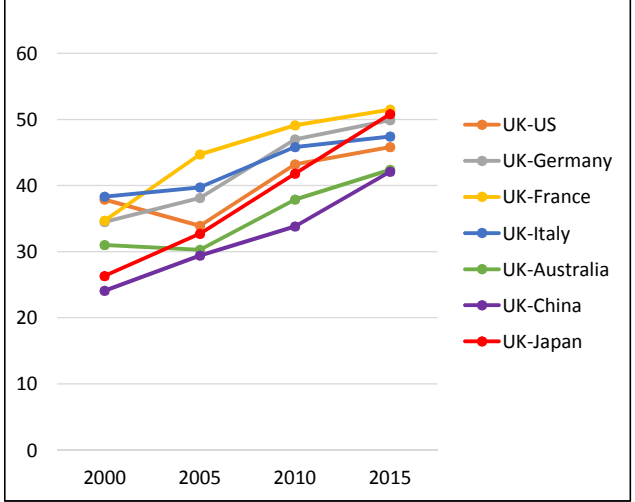


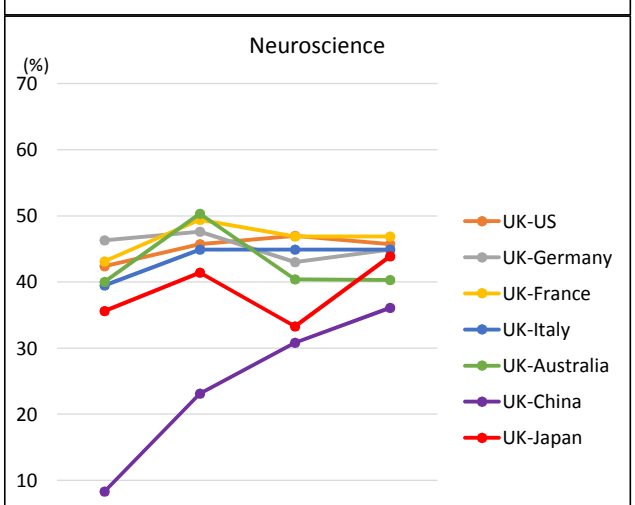


Outputs in Top 10 citation percentile (%) of Joint Publications

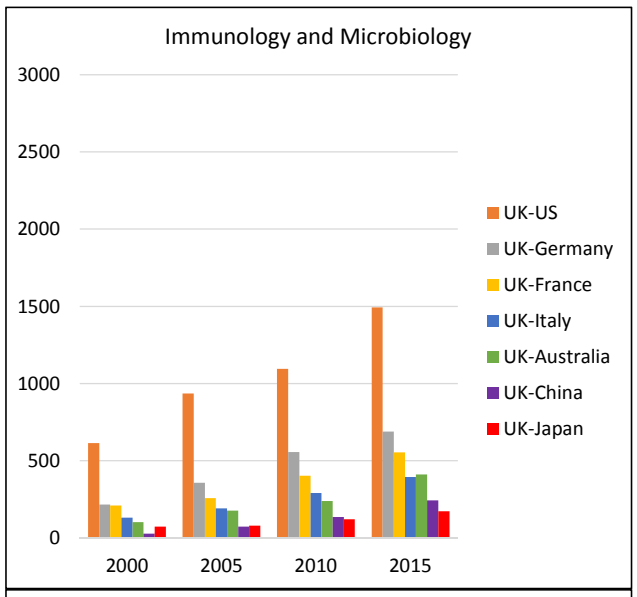


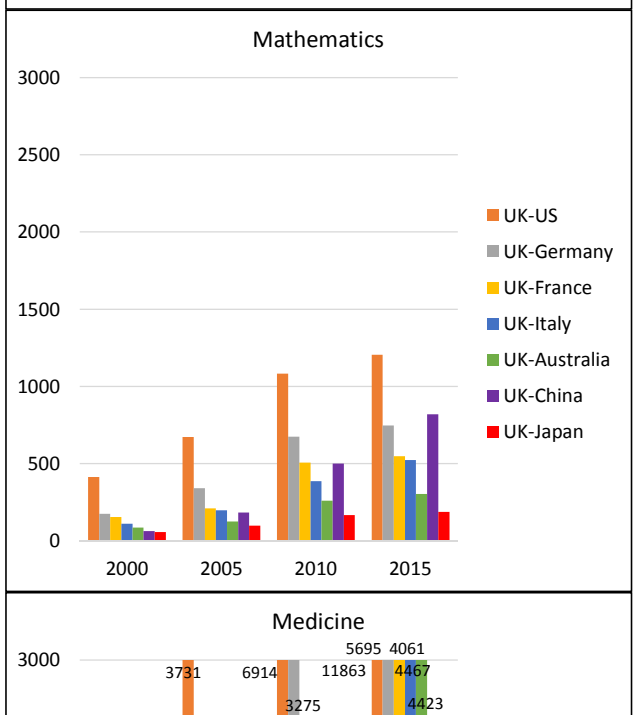


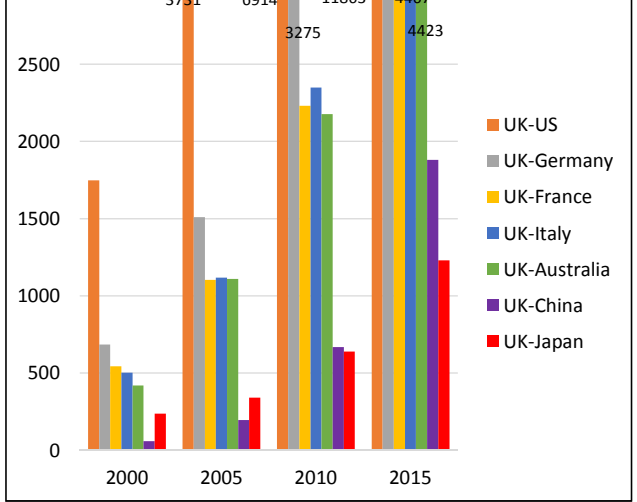


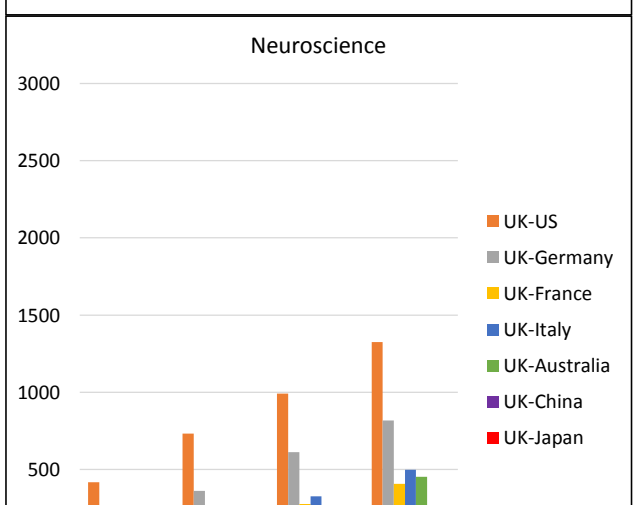


Number of Joint Publications

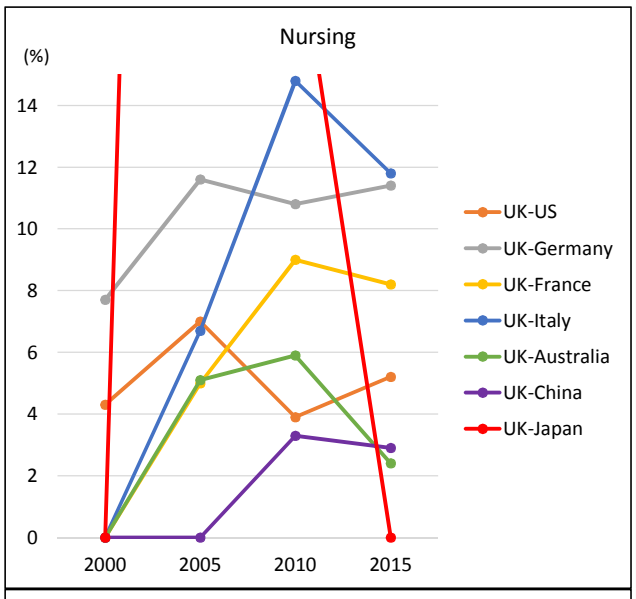


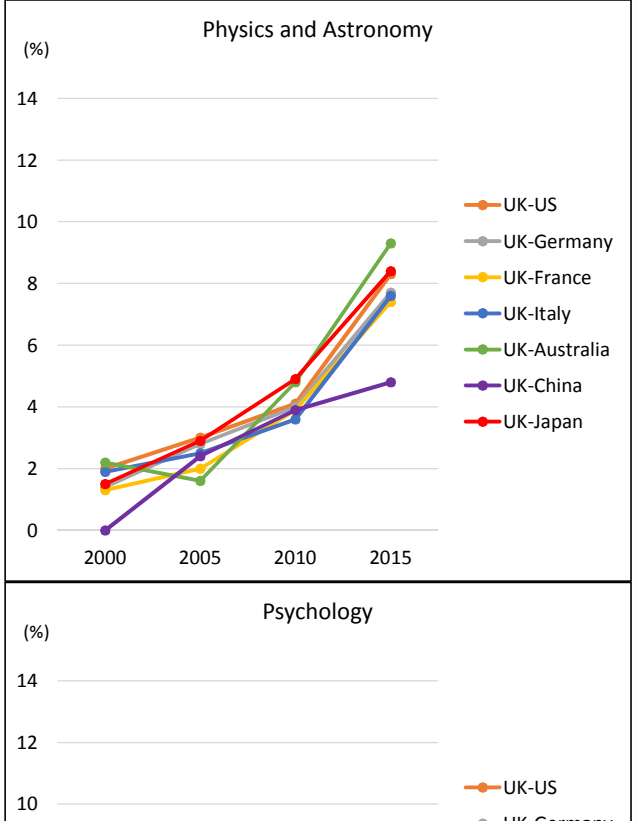


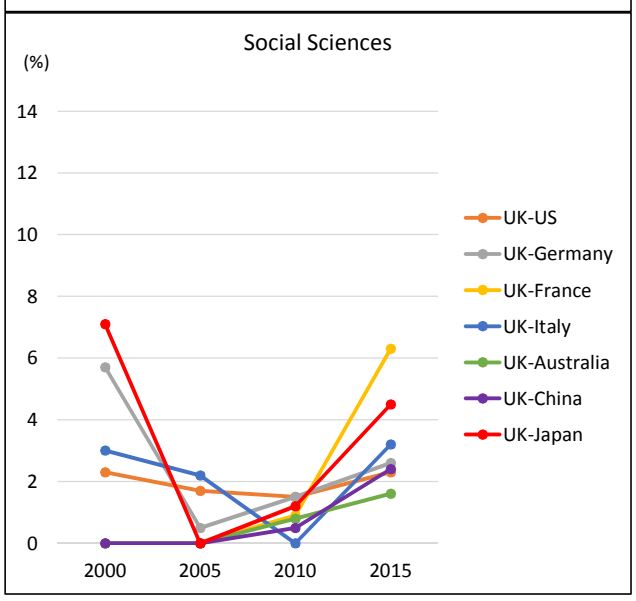


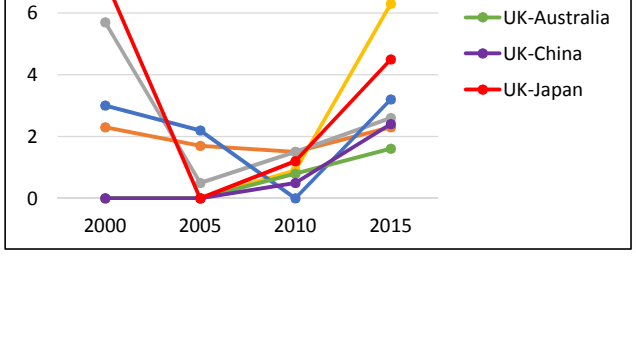


Outputs in Top 1 citation percentile (%) of Joint Publications

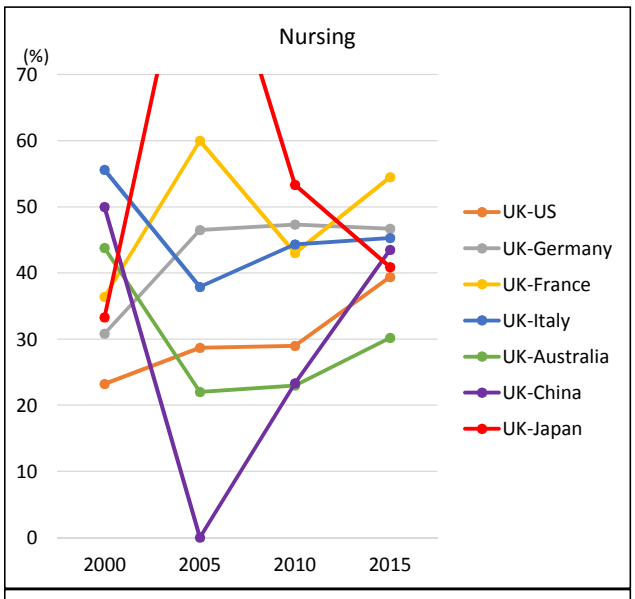


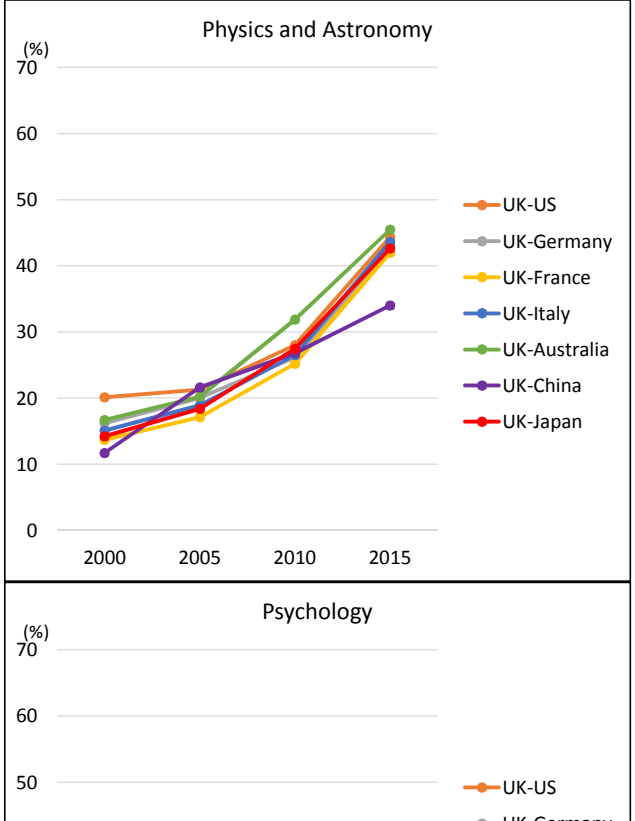


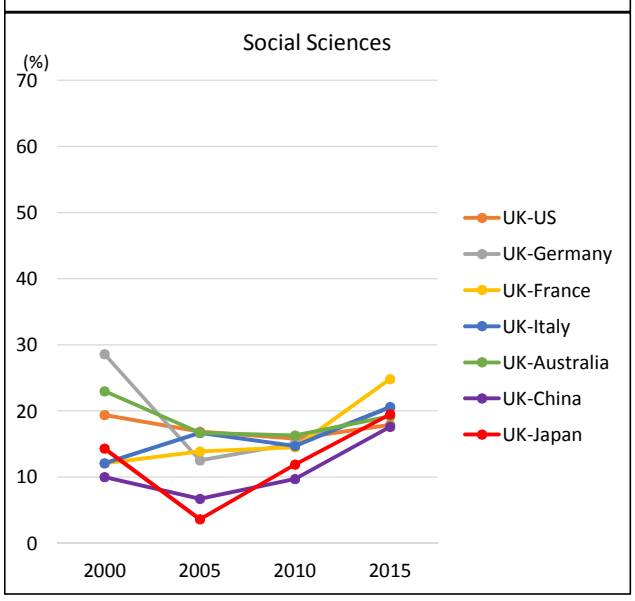


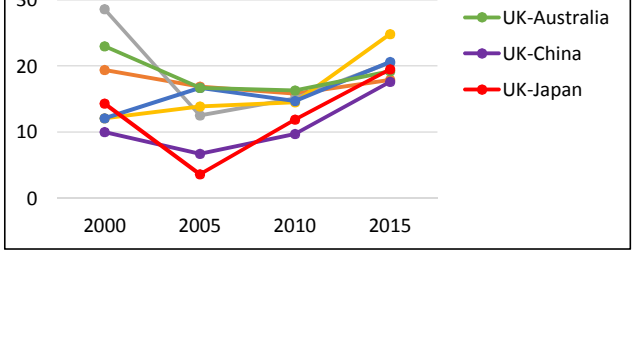


Outputs in Top 10 citation percentile (%) of Joint Publications

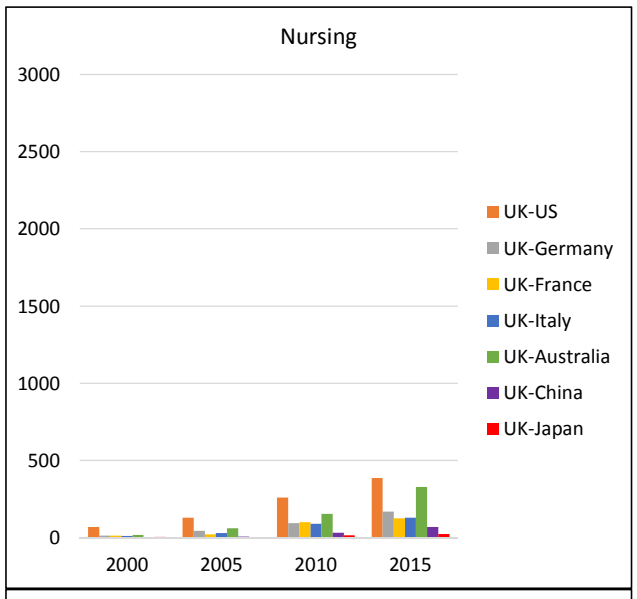


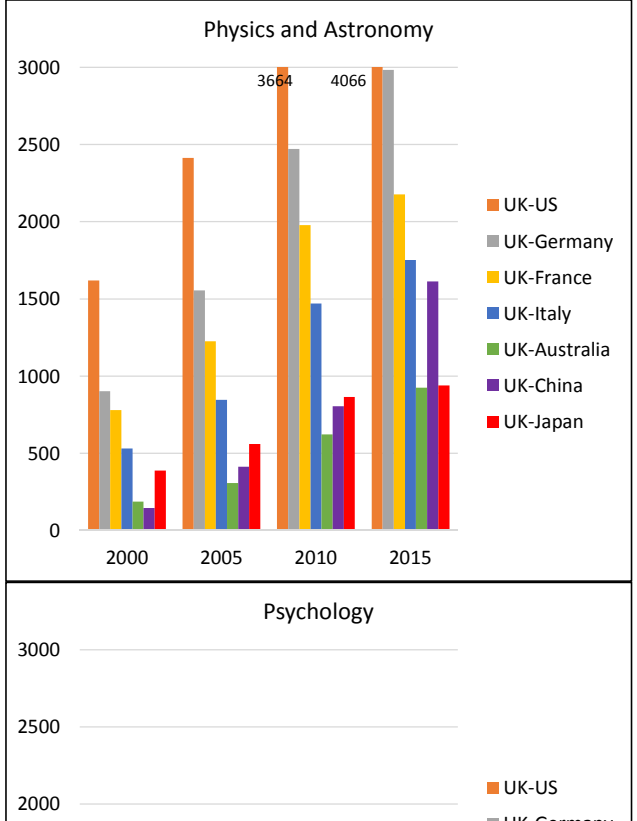


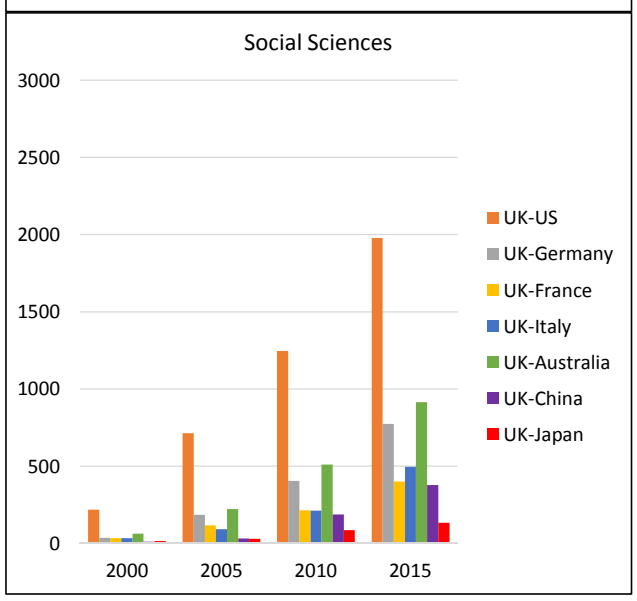


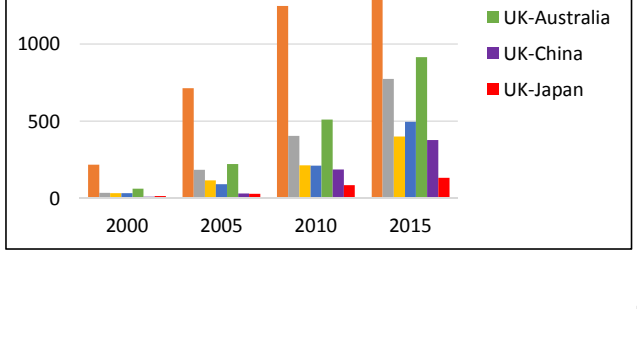


Number of Joint Publications

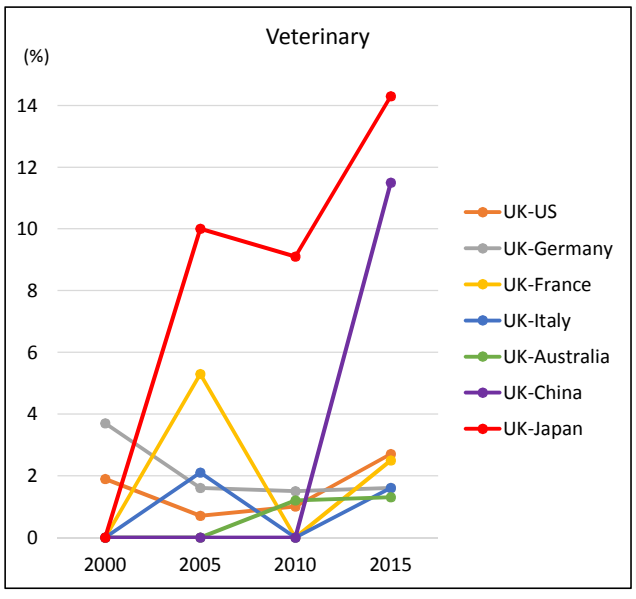




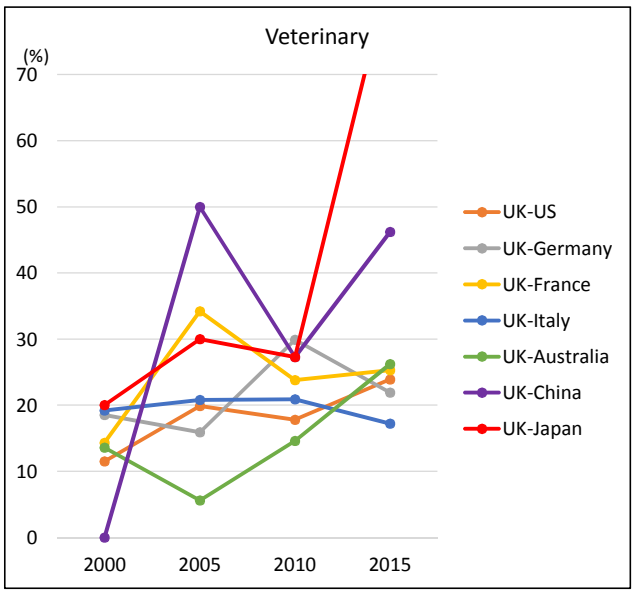




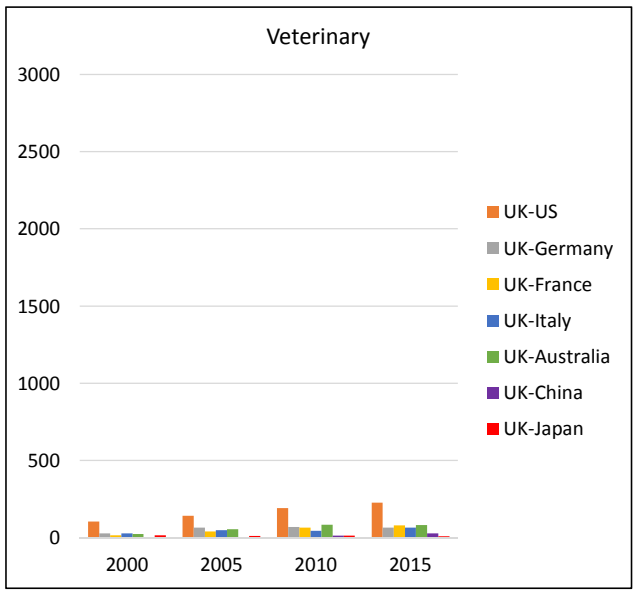
Outputs in Top 1 citation percentile (%) of Joint Publications



Outputs in Top 10 citation percentile (%) of Joint Publications



Number of Joint Publications



Data source: Scopus

Note: Points to be aware of when analysing the data in this report.

Joint publications are just one type of research collaboration outcome. International research collaboration should not be evaluated only by joint publications. For example, education of early career researchers is one significant aspect of international joint research, but its performance should be measured by many viewpoints.

Citation count is generally considered as an indicator of impacts produced from research. However, highly original and pioneering research tends to have fewer citations at first due to a limited number of researchers who engage in such research.